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CCITT

THE INTERNATIONAL
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CONSULTATIVE COMMITTEE

X.660

DATA COMMUNICATION NETWORKS

INFORMATION TECHNOLOGY – OPEN SYSTEMS INTERCONNECTION – PROCEDURES FOR THE OPERATION OF OSI REGISTRATION AUTHORITIES: GENERAL PROCEDURES

Recommendation X.660

Foreword

ITU (International Telecommunication Union) is the United Nations Specialized Agency in the field of telecommunications. The CCITT (the International Telegraph and Telephone Consultative Committee) is a permanent organ of the ITU. Some 166 member countries, 68 telecom operating entities, 163 scientific and industrial organizations and 39 international organizations participate in CCITT which is the body which sets world telecommunications standards (Recommendations).

The approval of Recommendations by the members of CCITT is covered by the procedure laid down in CCITT Resolution No. 2 (Melbourne, 1988). In addition, the Plenary Assembly of CCITT, which meets every four years, approves Recommendations submitted to it and establishes the study programme for the following period."

In some areas of information technology, which fall within CCITT's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC. The text of CCITT Recommendation X.660 was approved on 10th September 1992. The identical text is also published as ISO/IEC International Standard 9834-1.

CCITT NOTE

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

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Contents

Page

1 Scope 1

2 Normative references 1

2.1 Identical Recommendations | International Standards 1

2.2 Paired CCITT Recommendations | International Standards equivalent in technical content 1

2.3 Additional references 2

3 Definitions 2

4 Abbreviations 4

5 Registration 4

5.1 Overview 4

5.2 Management of the registration naming-domain 4

5.3 Operation 5

6 Registration-hierarchical-names 5

7 International Registration-Authorities 5

7.1 Requirement for an International Registration Authority 6

7.2 Operation of International Registration Authorities 6

7.3 Sponsoring Authorities 6

8 Contents of registration procedures for objects of a particular type 7

9 Progression of registration procedures for objects of a particular type 8

Annex A Derivation of object identifiers 9

Annex B Derivation of Directory names 11

Annex C Derivation together of object identifiers and Directory names 12

Annex D References to this Recommendation | International Standard 13

INFORMATION NOTE

The following table gives a list of X.700 Series Recommendations which were developed in collaboration with the ISO/IEC and are identical to the corresponding International Standard. Cross-references to the corresponding ISO/IEC International Standard number and the short title of the Recommendation | International Standard are provided.

CCITT Recommendation ISO/IEC International Standard	Short Title
X.700 | 7498-4 (Note)	Management Framework
X.701 | 10040	System Management Overview
X.710 | 9595 (Note)	Common Management Information Service Definition
X.711 | 9596-1 (Note)	Common Management Information Protocol Specification
X.712 | 9596-2	CMIP PICS
X.720 | 10165-1	Management Information Model
X.721 | 10165-2	Definition of Management Information
X.722 | 10165-4	Guidelines for the Definition of Managed Objects
X.730 | 10164-1	Object Management Function
X.731 | 10164-2	State Management Function
X.732 | 10164-3	Attributes for Representing Relationships
X.733 | 10164-4	Alarm Reporting Function
X.734 | 10164-5	Event Management Function
X.735 | 10164-6	Log Control Function
X.736 | 10164-7	Security Alarm Reporting Function
X.740 | 10164-8	Security Audit Trail Function
NOTE – This Recommendation and International Standard are not identical, but are technically aligned.	

INTERNATIONAL STANDARD

CCITT RECOMMENDATION

INFORMATION TECHNOLOGY – OPEN SYSTEMS INTERCONNECTION – SYSTEMS MANAGEMENT OVERVIEW – PROCEDURES FOR THE OPERATION OF OSI REGISTRATION AUTHORITIES: GENERAL PROCEDURES

1 Scope

This Recommendation | International Standard:

a) specifies procedures which are generally applicable to registration of objects within the OSIE;

b) specifies the hierarchical structure of the naming-domain within which this registration occurs;

c) provides guidelines for the establishment and operation of International OSI Registration Authorities;

d) provides guidelines for additional Recommendations | International Standards which choose to reference the procedures in this Recommendation | International Standard.

NOTE – This Recommendation | International Standard does not exclude or disallow the use of any syntactic forms of names or any naming domains for registration purposes provided that the domains ensure nonambiguity within their scope. This Recommendation | International Standard is intended to cover those cases where the registration-hierarchical-name is appropriate.

Information about registration for specific objects in the OSIE is contained in separate Recommendations | International Standards.

This Recommendation | International Standard applies to registration within the OSIE by Recommendations | International Standards, by International Registration Authorities, and by any organization which requires to act as a registration authority.

2 Normative references

The following CCITT Recommendations and International Standards contain provisions which, through reference in this text, constitute provisions of this CCITT Recommendation | International Standard. At the time of publication, the editions indicated were valid. All Recommendations and Standards are subject to revision, and parties to agreements based on this CCITT Recommendation | International Standard are encouraged to investigate the possibility of applying the most recent edition of the Recommendations and Standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards. The CCITT Secretariat maintains a list of currently valid CCITT Recommendations.

2.1 Identical Recommendations | International Standards

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

2.2 Paired Recommendations | International Standards equivalent in technical content

– CCITT Recommendation X.200 (1988), *Reference Model of Open Systems Interconnection for CCITT applications.*

ISO 7498: 1984, *Information processing systems – Open Systems Interconnection – Basic Reference Model.*

– CCITT Recommendation X.208 (1988), *Specification of Abstract Syntax Notation One (ASN.1).*

ISO/IEC 8824: 1990, *Information technology – Open Systems Interconnection – Specification of Abstract Syntax Notation One (ASN.1).*

– CCITT Recommendation X.501 (1988), *The Directory – Models.*

ISO/IEC 9594-2: 1990, *Information technology – Open Systems Interconnection – The Directory – Part 2: Models.*

– CCITT Recommendation X.520 (1988), *The Directory – Selected attribute types.*

ISO/IEC 9594-6: 1990, *Information technology – Open Systems Interconnection – The Directory – Part 6: Selected attribute types.*

– CCITT Recommendation X.650 (1992), *Open Systems Interconnection (OSI) – Reference Model for Naming and Addressing.*

ISO 7498-3: 1989, *Information processing systems – Open Systems Interconnection – Basic Reference Model – Part 3: Naming and addressing.*

2.3 Additional references

– ISO 3166: 1988, *Codes for the representation of names of countries.*

– ISO 6523: 1984, *Data interchange – Structures for the identification of organizations.*

– ISO 8571-1: 1988, *Information processing system – Open Systems Interconnection – File transfer, access and management. Part 1: General introduction.*

– ISO/IEC 9545: 1989, *Information technology – Open Systems Interconnection – Application Layer Structure.*

– ISO/IEC 9834-3: 1990, *Information technology – Open Systems Interconnection – Procedures for the operation of OSI Registration Authorities – Part 3: Registration of object identifier component values for joint ISO-CCITT use.*

3 Definitions

3.1 The following term is used in this Recommendation | International Standard and is defined in ISO 6523:

organization

3.2 The following terms are used in this Recommendation | International Standard, and are defined in CCITT Rec. X.200 | ISO 7498:

a) Open Systems Interconnection environment;

NOTE – This term is not formally defined in the current version of ISO 7498-1. A definition will be given in the revision which is currently being prepared.

b) protocol-control-information.

3.3 The following terms are used in this Recommendation | International Standard, and are defined in CCITT Rec. X.650 | ISO 7498-3:

a) name;
b) naming authority;
c) naming domain;
d) synonym.

3.4 The following terms are used in this Recommendation | International Standard, and are defined in ISO/IEC 9545:

a) application-entity-title,

b) application-process-title.

3.5 The following terms are used in this Recommendation | International Standard, and are defined in CCITT Rec. X.208 | ISO/IEC 8824:

a) object,

b) object identifier.

3.6 The following terms are used in this Recommendation | International Standard, and are defined in CCITT Rec. X.501 | ISO/IEC 9594-2:

a) attribute;

b) attribute type;

c) attribute value;

d) attribute value assertion;

e) Directory name;

f) object class;

g) relative distinguished name.

3.7 The following terms are used in this Recommendation | International Standard, and are defined here:

3.7.1 object (of interest): Anything in some world, generally the world of telecommunications and information processing or some part thereof,

a) which is identifiable (can be named); and
b) which may be registered.

NOTE – Examples of objects are information objects (defined in CCITT Rec. X.208 | ISO/IEC 8824), application-entities (defined in CCITT Rec. X.650 | ISO 7498-3) and managed objects (defined in CCITT Rec. X.722 | ISO/IEC 10165-4).

3.7.2 registration: The assignment of an unambiguous name to an object in a way which makes the assignment available to interested parties.

3.7.3 registration authority: An entity such as an organization, a standard or an automated facility that performs registration of one or more types of objects.

NOTE – For this Recommendation | International Standard the above definition of registration authority extends the term to cover registration by organizations acting at international, regional and national levels and by other means. For clarity, the term International Registration Authority is used in this Recommendation | International Standard to refer to an organization performing registration at the international level.

3.7.4 registration procedures: The specified procedures for performing registration and amending or deleting existing registrations.

3.7.5 sponsoring authority: An organization recognized by the requirements of this International Standard to receive proposals for registration and to submit applications accordingly to an International Registration Authority (see 7.2).

3.7.6 registration hierarchical-name: A name which is unambiguous within the OSIE and which is assigned by registration. The semantic form of this name is structured according to the rules in clause 6.

3.7.7 registration hierarchical-name-tree: A tree whose nodes correspond to objects that are registered and whose non-leaf nodes may be registration authorities.

3.7.8 administrative role (of a registration authority): Assigning and making available unambiguous names according to the Recommendation | International Standard defining the procedures for the authority.

3.7.9 technical role (of a registration authority): Recording definitions of the objects to which names are assigned and verifying that these definitions are in accordance with the Recommendation | International Standard defining the form of the definition.

3.7.10 International (OSI) Registration Authority: A registration authority acting at the international level according to the procedures for its operation defined in the relevant Recommendation | International Standard.

4 Abbreviations

FTAM	File Transfer, Access and Management
ISP	International standardized profile
OSI	Open Systems Interconnection
OSIE	Open Systems Interconnection environment
PCI	protocol-control-information
RH-name	registration-hierarchical-name
RH-name-tree	registration-hierarchical-name-tree
RDN	relative distinguished name

5 Registration

5.1 Overview

5.1.1 Many OSI Recommendations | International Standards define certain objects for which unambiguous identification within the OSIE is required. This is achieved by registration.

NOTE – Examples of these objects are an application-process, an application-entity and the definition of a class of information such as a file format.

5.1.2 Registration is the assignment of a name to an object in a way which makes the assignment available to interested parties. It is carried out by a registration authority.

5.1.3 Registration can be effected by a Recommendation | International Standard, by publishing in the Recommendation | Standard the names and the corresponding definitions of object. Such a mechanism requires amendment of the Recommendation | Standard for each registration, and hence is not appropriate in cases where the registration activity is high.

5.1.4 Alternatively, registration can be effected by permitting one or more organizations to act as registration authorities to perform registration on a flexible basis.

5.1.5 The form of name used and the management of the registration naming-domain ensures independent assignment of unambiguous names by different registration authorities.

5.2 Management of the registration naming-domain

5.2.1 The management of the entire registration naming-domain is accomplished by a process of delegation of authority. In this process the registration authority responsible for a given naming-domain may partition that naming-domain. In doing so, it may or may not delegate the registration responsibility for the naming-domain formed by each partition to a subordinate registration authority. The naming of a partition does not necessarily imply authority to register objects under that partition. This delegation of registration responsibility can be applied repeatedly with a subordinate registration authority partitioning further the naming domain for which it is responsible and delegating responsibility for those partitions to registration authorities subordinate to it.

5.2.2 The registration authority responsible for a given naming-domain must assign a name to the partition of that naming-domain that a given sub-authority will manage. The name assigned shall be globally unambiguous, and shall be concatenated as a prefix to all names assigned by that sub-authority. The repeated application of this process through a hierarchy of registration agents ensures the generation of unambiguous names. The generation of names for registration purposes is discussed further in clause 6.

NOTE – An organization, a Recommendation | International Standard or an automated facility can be the registration authority for more than one partition of a naming-domain.

5.3 Operation

5.3.1 A registration authority may concern itself only with unambiguous assignment of names (the administrative role) or may in addition need to concern itself with recording definitions of objects and verifying that these definitions are in accordance with the Recommendation | International Standard defining the form of the definition (the technical role).

5.3.2 The criteria for registering an object may vary among registration authorities. It is the responsibility of each authority to establish those criteria. A registration authority may also choose to define criteria for any authorities which are subordinate to it.

NOTE – Among the criteria to be considered in the registration of an object is the level at which registration is appropriate. For example it may be that the definition of an object registered by a particular registration authority may find wide use beyond the community serviced by that registration authority. Although the assigned name is globally unambiguous and can be used outside that community, it may be desirable to restate the definition in the style acceptable to the larger community of interest. If so, the restated definition should be registered with the registration authority appropriate for that larger community.

5.3.3 Synonyms are created when an instance of a type of object is registered more than once. There may be valid reasons for creating synonyms, e.g. Directory aliases. It is difficult to detect occurrences of synonyms. In case where synonyms are undesirable it may be possible to reduce the number by such means as technical review or administrative fees (in the case of registration authorities). It must be decided in each case whether this is necessary and practical.

NOTE – There is no practical way to ensure that the same object has not been registered by multiple registration authorities and the procedures in this Recommendation | International Standard do not ensure that only a single name is assigned to an object.

6 Registration-hierarchical-names

6.1 The RH-name-tree is a tree whose root corresponds to this Recommendation | International Standard and whose leaf and non-leaf nodes correspond to objects that are registered. Non-leaf nodes correspond to registration authorities where registration responsibility has been delegated to them by a superior node.

6.2 The arcs from a given node to its immediate subordinates are unambiguously identified within the scope of the node by each of one or more values of different types. These values are assigned by the registration authority corresponding to the superior node. Thus, any path from the root to a node provides an unambiguous name for that node by concatenating (in order) the values of a given type for the arcs on the path.

NOTE – If any arc is not assigned a value of a given type, then the node identified by the arc and all of its subordinates cannot be referenced using names constructed with values of that type.

6.3 The types of values assigned by a registration authority can include integer values, alphanumeric values and other types of values. The contents of character sets and composition rules for values formed at subordinate arcs should be defined in registration authority procedure standards. The contents of character sets and composition rules may be further constrained or extended by subordinate registration authorities taking into consideration the expected use of the resulting values in different forms of name.

NOTE – To keep to a minimum the number of values assigned to top-level arcs in the RH-name-tree, it is desirable that the types of values assigned to arcs be generic, i.e. applicable to many name forms.

6.4 Where a given set of registration authorities assigns values of more than one type, the significance, if any, of the relationship between the resultant names (generated as defined in 6.2) is outside the scope of this document.

6.5 The generation of some specific forms of name for registration purposes is defined in the Annexes to this Recommendation | International Standard. The generation of other forms of name is also defined in other registration authority documents or in relevant Recommendations | International Standards.

7 International Registration-Authorities

NOTE – Although this clause applies only to International Registration Authorities, other registration authorities may wish to implement similar rules for their operation.

7.1 Requirement for an International Registration Authority

The identification of, and formal agreement on the need for, an International Registration Authority is established in the Recommendation | International Standard which defines the type of object. Procedures which are generally applicable to the operation of International Registration Authorities are defined in this clause. Procedures which are specific to the type of object are defined in a separate Recommendation | International Standard developed for that purpose.

NOTE – The identity of the organization operating any specific International Registration Authority can be obtained from the CCITT or ISO Secretariats.

7.2 Operation of International Registration Authorities

7.2.1 Each International Registration Authority shall maintain a register of the names assigned to objects and (where the registration authority performs a technical role) the associated definitions of the objects. The form of name to be used and the form of register entry are defined in a separate Recommendation | International Standard.

7.2.2 With regard to the initial assignment of names and definitions to objects and of subsequent additions to the register, the responsibilities of an International Registration Authority shall be as follows:

a) to receive from Sponsoring Authorities (see 7.3) proposals for register entries;

b) to process proposals for entries according to the procedures specified in the applicable Recommendation | International Standard;

c) to record names for each register entry that is accepted, in accordance with the procedures specified in the applicable Recommendation | International Standard;

d) to promulgate the register entries according to the procedures specified in the applicable Recommendation | International Standard, and

e) to convey the results in a specified form to the appropriate Sponsoring Authority when the processing of a proposal has been completed.

7.2.3 With regard to deletions from the register, the responsibilities of an international Registration Authority shall be as follows:

a) to receive proposals from Sponsoring Authorities (see 7.3);

b) to process the proposals for deletion, according to the procedures specified in the applicable Recommendation | Part of this International Standard or separate International Standard;

c) to promulgate the register deletions according to the procedures specified in the applicable Recommendation | International Standard; and

d) to convey the results in a specified form to the appropriate Sponsoring Authority when the processing of a proposal has been completed.

7.3 Sponsoring Authorities

7.3.1 A Sponsoring Authority is the CCITT Secretariat | any JTC 1 Technical Committee or Subcommittee, an administration | national body, or a liaison organization.

7.3.2 The responsibilities of a Sponsoring Authority shall be as follows:

a) to receive proposals concerning objects from within their respective countries or organization;

b) to effect any necessary rationalizations or coordination of these proposals and to forward them to the International Registration Authority; and

c) to make known within their respective countries or organizations the decisions taken on their proposals as transmitted to them by the International Registration Authority.

8 Contents of registration procedures for objects of a particular type

8.1 Registration procedures for objects of a particular type may be specified in a separate Recommendation | International Standard. A clear distinction shall be made in these registration procedures between those procedures which apply in general to registration for the type of object, and those which apply to the specific International Registration Authority (if any) established by the Recommendation | International Standard.

8.2 The contents of each Recommendation | International Standard shall include:

a) the justification of the need for the registration;

b) a statement of the scope of objects to be registered;

c) references to the Recommendation | International Standard in which the type of object is defined and to any other applicable Recommendations | International Standards, together with identification of the CCITT Study Group | JTC 1 Subcommittee responsible for the definition of the type of object;

d) definitions and abbreviations used in the registration procedures;

e) a statement whether the registration requires a registration authority to perform a technical role;

f) a specification of the contents of register entries, including at least:

1) the name assigned to the object;

2) the name of the organization that proposed the entry;

3) the dates of submission/registration;

4) the definition of the object (where the registration authority performs a technical role);

g) identification of those clauses of this Recommendation | International Standard which apply together with the specification of any necessary amendments to be applied to those clauses for the purposes of the specific registration;

h) for an International Registration Authority, a complete specification of the procedures (manual or automated) to be applied to create, interrogate, modify, delete or audit registered items. This includes any access restrictions imposed on these operations. In particular, the following are specified:

1) the method used to determine whether a request for registration or deletion should be accepted.

NOTE – This may include (but it is not limited to) administration approval | national body vote or national body exception (where silence means tacit acceptance), or automated processes. The following criteria for rejection of a proposal may be relevant:

a) incomplete or incomprehensible definition;

b) existence of an identical or similar entry in the register;

c) the proposed entry is not one of the permitted entries;

d) the proposed entry does not conform to a Recommendation | International Standard listed in the References of the appropriate Recommendation | International Standard;

e) the justification for inclusion in the register is not adequate.

2) how rejections shall be resolved;

3) whether modification of register entries or reuse of the names of register entries is allowed and (if so) a specification of mechanisms to allow this to happen, and

4) the procedures to be applied to determine whether and how the register shall be updated to include relationships to further Recommendation | International Standards,

i) identification of any propagation/notification requirements associated with registered items.

NOTE – For example there should be a statement on whether the registered information is to be made available to users through a Recommendation | International Standard or an ISP, or by application to the International Registration Authority; and, in the case of application to the International Registration Authority, a description of the procedure to be followed by people or organizations which need to obtain registered information;

j) examples of register entries [in Annex(es) to the Recommendation | International Standard].

8.3 Each Recommendation | International Standard shall specify the use of RH-names for the purpose of registration.

NOTE – Some individual Recommendations | International Standards apply to the registration of objects that are to be accessible using the Directory Service. In order for this to be possible, in some cases it may be necessary to identify, and possibly specify, an appropriate object class to define what information is held in the Directory entry for an instance of each object class.

9 Progression of registration procedures for objects of a particular type

The registration procedures for objects of a particular type may be specified in a separate Recommendation | International Standard. The progression of such a Recommendation | International Standard follows the procedures defined below:

a) identification and formal agreement that a new Recommendation | International Standard is required, and identification and agreement on the requirements for registration shall be stated in any International Standard or prospective Recommendation | International Standard which gives rise to the need for registration.

NOTE – A Recommendation | International Standard is normally appropriate for any object where either:

1) an explicit International Registration Authority is needed because of the expected frequency of new or amended registrations at the international level; and/or

2) a number of Recommendations | International Standards have identified the need for registration for a type of object, but, because of the complexity of the information necessary to define instances of the type, it is judged to be desirable to specify this information in a separate document; and/or

3) registration procedures to be used by organizations requiring registration for their own purposes cannot be adequately described by a reference only to this Recommendation | International Standard from another Recommendation | International Standard.

See also Annex D.

b) assignment of the development of a new Recommendation | International Standard to a specific CCITT Study Group | Working Group of a Subcommittee of JTC 1;

c) generation and approval of a New Work Item proposal using normal JTC 1 procedures, and/or, if necessary, the generation and approval of a new Question using normal CCITT procedures;

d) progression of the Recommendation | International Standard to become a Recommendation | International Standard according to normal procedures.

NOTES

1 Where an International Registration Authority is necessary for the operation of a base Recommendation | International Standard, the base Recommendation | International Standard normally receives final approval only when the relevant Recommendation | International Standard specifying the procedures for the registration authority is at least a draft Recommendation | at the draft International Standard ballot stage, and an organization has been nominated to act as the registration authority. Where an International Registration Authority is not necessary, this constraint does not apply.

2 The criteria to be applied in the choice of a body which is proposed for an International Registration Authority are determined by CCITT and/or ISO/IEC JTC 1. The proposal of an organization to the CCITT Secretariat and/or JTC 1 to act as an International Registration Authority requires at the same time the provision by the submitter of the proposal of an estimate of the activity expected at the international level (e.g. volume of requests for registration per year).

3 In cases where modification of the operation of a Registration Authority requires modification to a Recommendation | International Standard, this modification must follow normal procedures for changing Recommendations | International Standards.

Annex A
Derivation of Object identifiers

(This annex forms an integral part of this Recommendation | International Standard)

A.1 In accordance with the provisions of clause 6, object identifiers for registration purposes are generated by a set of registration authorities when:

a) the names assigned to the arcs of the RH-name-tree integer values;

b) the top level arcs of the RH-name-tree are assigned integer values in full accordance with Annexes B, C and D of CCITT Rec. X.208 | ISO/IEC 8824; and

c) responsibility for the sub-trees beneath these arcs is also delegated in accordance with CCITT Rec. 208 | ISO/IEC 8824.

The values assigned to the top-level arcs of the RH-name-tree by CCITT Rec. X.208 | ISO/IEC 8824 are listed in Table A.1, together with the assignment of country-name arcs under {joint-iso-ccitt(2) country(16)} as specified in A.5.

A.2 Within the area of work of CCITT | ISO/IEC, the object identifier for a node is obtained by taking the integer values for the arcs, in order, as object identifier components, as specified in CCITT Rec. X.208 | ISO/IEC 8824.

Table A.1 – Object identifiers

RH-name-tree	Object identifier
ccitt(0) recommendation(0)	{0 0 n}
ccitt(0) question(1) n	{0 1 n}
ccitt(0) administration(2) n	{0 2 n}
ccitt(0) network-operator(3) n	{0 3 n}
iso-(1) standard(0) n	{1 0 n}
iso-(1) registration-authority(1) n	{1 1 n}
iso-(1) member-body(2) n	{1 2 n}
iso-(1) identified-organization(3) n	{1 3 n}
joint-iso-ccitt(2) n	{2 n}
joint-iso-ccitt(2) country(16) country-name(n)	{2 16 n}
joint-iso-ccitt(2) registration-procedures(17) specific-procedure(n)	{2 17 n}

The object identifier is derived directly from the integer values of the RH-name-tree.

NOTES

1 In the RH-name-tree column the terms (standard, etc.) are used as defined in CCITT Recommendation X.208 | ISO/IEC 8824. The terms do not refer to Directory attribute type definitions.

2 Rules pertaining to object identifiers apply to all the object identifiers created from values contained in the RH-name-tree and not only to the identifiers allocated under the joint-iso-ccitt arc as described in this Annex.

Example: The FTAM PCI abstract syntax information object, defined in ISO 8571, has been assigned the object identifier value:

{iso(1) standard(0) FTAM(8571) abstract-syntax(2) pci(1)}

A.3 For areas of joint work a Recommendation | International Standard needing to assign names to objects defined within it, assigns values beneath the node identified by the number which is assigned according to ISO/IEC 9834-3:

{joint-iso-ccitt(2) n}

A.4 This area of joint work on registration procedures by CCITT and ISO/IEC is assigned the object identifier.

{joint-iso-ccitt(2) registration-procedures(17)}

Related Recommendations | International Standards or other Recommendations | International Standards are assigned domains by the assignment of values to arcs beneath this object identifier. Where a Recommendation | International Standard specifies the operation of an International | Registration Authority it will, in general, assign the use of the arcs for which it is responsible to that authority.

Example: ISO/IEC 9834-2 assigns the use of arcs for which it is responsible to the International Registration Authority for Document Types. Thus, the object identifier for the third registered instance of the Document Type information object is:

{joint-iso-ccitt(2) registration-procedures(17) document-types(2) binary(3)}

A.5 For joint registration purposes, this Recommendation | International Standard specifies the object identifier:

{joint-iso-ccitt(2) country(16)}

The values assigned to country-name arcs under this object-identifier are the numeric-3 codes of ISO 3166.

The node identified by a country-name arc may be used to assign object identifiers within a country. The administration of this node is not prescribed by this Recommendation | International Standard. While it is preferred that a single national registration authority be determined by the joint decision of the country's CCITT administration and ISO/IEC national body, the assignment of registration responsibilities with a country is a national decision.

Annex B
Derivation of Directory names

(This annex forms an integral part of this Recommendation | International Standard)

B.1 In accordance with the provisions of clause 6, Directory names for registration purposes are generated by a set of registration authorities when

a) the values assigned to the arcs of the RH-name-tree are relative distinguished names (RDN), as defined in CCITT Rec. X.501 | ISO/IEC 9594-2; and

b) the top level arcs of the RH-name-tree are assigned RDN values with the "countryName" attribute type as defined in CCITT Rec. X.520 | ISO/IEC 9594-6 and with attribute values taken from the country codes defined in ISO 3166, in full accordance with CCITT Rec. X.521 | ISO/IEC 9594-6.

NOTE – Attribute types and values for top level arcs which do not represent countries are not assigned by this Recommendation | International Standard but may be assigned in the future. The assignment of additional attribute types is not to be taken to imply support by the Directory for these new attribute types.

B.2 The Directory name for a node is obtained by taking the RDN values, in order, as Directory name components, as specified in CCITT Rec. X.502 | ISO/IEC 9594-2.

Example: The Directory name form of an Application-process-title for an analysis package run by the Reading Design Office of XYZ Fastening plc in the UK could be:

{countryName = GB, organizationName = "Superstitch Fastenings plc", organizationalUnitName = "Reading Design Office", commonName = "Analysis Package"}

B.3 The administration of the registration authority identified by a countryName arc is not prescribed by this Recommendation | International Standard. While it is preferred that a single national registration authority be determined by the joint decision of the country's CCITT administration and ISO/IEC national body, the assignment of registration responsibilities within a country is a national decision.

B.4 The existence of multiple name forms does not imply their support by the Directory nor does it imply any requirement to map from one name form to another.

Annex C
Derivation together of object identifiers and Directory names

(This annex forms an integral part of this Recommendation | International Standard)

C.1 In accordance with the provisions of clause 6, object identifiers and Directory names are generated together for registration purposes by a set of registration authorities when:

a) the provisions of both Annex A and Annex B are met; and

b) the object identifier form of name is generated under the {joint-iso-ccitt country country-name } arc.

Example:

RH-name: Alphanumeric value	*RDN (Distinguished Name)*
countryName = US	C = US (C = US)
stateOrProvinceName = Hawaii	SP = Hawaii (C = US,SP = Hawaii)
organizationName = Gregory's Dolphins	O = Gregory's Dolphins (C = US,SP = Hawaii, O = Gregory's Dolphins)
organizationalUnitName = Shipping Department	OU = Shipping Department (C = US,SP = Hawaii, O = Gregory's Dolphins, U = Shipping Department)

RH-name: integer value	*object identifier*
joint-iso-ccitt(2)	{2}
country(16)	{2 16}
country-name(840)	{2 16 840}
state-or-province(46)	{2 16 840 46}
organization(3125)	{2 16 840 46 3125}
organizational-unit(3)	{2 16 840 46 3125 3}

C.2 The existence of multiple forms of name does not imply their support by the Directory nor does it imply any requirement to map from one form of name to another.

Annex D
References to this Recommendation | International Standard

(This annex does not form an integral part of this Recommendation | International Standard)

D.1 Where a Recommendation | International Standard defines types of object for which unambiguous identification of instances of the type are required within the OSIE, then it establishes a requirement for registration.

D.2 The writers of the Recommendation | International Standard determine, for each such name, the appropriate forms of registration. There are four main options which arise:

a) registration in the Recommendation | International Standard which defines the type of object;

b) registration in Recommendations | International Standards referencing the Recommendation | International Standard which defines the type of object;

c) registration by any International | Registration Authority;

d) registration by any organization which requires to act as a registration authority.

D.3 Registration in the Recommendation | International Standard which defines the type of object is generally only appropriate if the number of registrations is small and likely to be changed infrequently. A current example is the definition of names for FTAM constraint-set fields which, if necessary, will be extended by amendment. If this is the only registration considered appropriate, the following text should be included in the relevant Recommendation | International Standard:

> "The names to be used in this field are specified in Annex... An International Registration Authority covering this type of object is not currently intended."

There would be no reference to CCITT Rec. X.660 | ISO/IEC 9834-1.

D.4 Registrations in Recommendations | International Standards referencing the Recommendation | International Standard which defines the type of object is appropriate if the names and corresponding definitions are closely tied to those Recommendations | International Standards. (A current example is ACSE application-context fields and presentation abstract syntax fields). If this is the only registration considered appropriate, the following text should be included in the relevant Recommendation | International Standard:

> "The names to be used in this field are specified in the Recommendations | International Standards referencing this Recommendation | International Standard. The name shall be defined in accordance with CCITT Rec. X.660 | ISO/IEC 9834-1. An International | Registration Authority covering this type of object is not currently intended."

The referencing Recommendation | International Standard will assign a name in accordance with CCITT Rec. X.660 | ISO/IEC 9834-1, but need not reference CCITT Rec. X.660 | ISO/IEC 9834-1.

D.5 Registration by an International Registration Authority requires the development of a new Recommendation | International Standard. If this is the only registration considered appropriate, the Recommendation | International Standard which defines the type of object should contain the text:

> "This Recommendation | International Standard requires an International Registration Authority for... The procedures governing the Authority and the form of register entries are specified in CCITT Rec. X... | ISO/IEC..."

NOTE – In this case the Recommendation | International Standard which defines type of object will not normally receive final approval until the relevant Recommendation | International Standard is at draft Recommendation | draft International Standard ballot stage and an organization has been nominated as the registration authority.

D.6 Where registration by any organization which has a need is considered appropriate, two further criteria need to be examined. These are:

a) are there any special relationships (requiring explanation) between these names and other names?

b) is a more detailed specification (beyond that which can be inferred from the Recommendation | International Standard which defines the type of object) needed of the information which would constitute registration?

D.7 Examples where D.6 a) would be true is AE-title, AP-title, etc. in ACSE. In this case a Recommendation | Part of ISO/IEC 9834 would normally be appropriate, with text in the Recommendation | International Standard which defines the type of object saying:

> "CCITT Rec. X... | ISO/IEC 9834-... specifies requirements for the assigning of names to..."

D.8 There are no current examples where D.6 b) is considered to be true, but in such cases the Recommendation | International Standard which defines the type of object contain text saying:

> "CCITT Rec. X... | ISO/IEC 9834-... specifies the information which is needed for registration of..."

D.9 If neither D.6 a) nor D.6 b) is true, and this is the only form of registration proposed, then the Recommendation | International Standard which defines the type of object would contain the text:

> "The assignment of names for ... shall be in accordance with the general procedures and of the form specified in CCITT Rec. X.660 | ISO/IEC 9834-1.
>
> Organizations wishing to assign such names shall find an appropriate superior in the naming tree of CCITT Rec. X.660 | ISO/IEC 9834-1 and request that an arc be assigned to them.
>
> NOTE – This includes CCITT administrations, ISO/IEC national bodies, organizations with International Code Designators assigned in accordance with ISO 6523, telecommunications administrations and RPOAs."

A separate Recommendation | International Standard is not required.

D.10 Where more than one form of registration is considered appropriate, combinations of the above texts should be included. In particular, in cases where registration can be allowed by any organization which requires to act as a registration authority, but public international (and/or national) registration is nevertheless desirable, a Recommendation | International Standard should be developed which sets out the options and specifies the operation of an International Registration Authority (if it is established). In this last case, the Recommendation | International Standard which defines the type of object should contain text saying:

> "CCITT Rec. X.... | ISO/IEC 9834-... specifies registration of..."