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SERIES M: TELECOMMUNICATION MANAGEMENT,
INCLUDING TMN AND NETWORK MAINTENANCE

Designations and information exchange

Formalization of interconnection designations among operators' telecommunication networks

ITU-T Recommendation M.1401



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ITU-T Recommendation M.1401

Formalization of interconnection designations among operators' telecommunication networks

Summary

This Recommendation defines designations and additional information intended primarily for human-to-human communication between various Operators, i.e., network operators or service providers.

This Recommendation contains data definitions for designations of interconnections and other information about network resources that are required to be communicated between operators.

This Recommendation is developed in order to facilitate computerized interoperation between telecommunication operators. For this use a more formal approach than M.1400 is required. See Appendix III.

Note that since ITU-T Rec. M.1400 does not formally specify data structures, backward compatibility with existing implementations may not be ensured, but this Recommendation is based on ITU-T Rec. M.1400. For further details, see Appendix II.

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Source

ITU-T Recommendation M.1401 was approved on 14 July 2006 by ITU-T Study Group 4 (2005-2008) under the ITU-T Recommendation A.8 procedure.

Keywords

Data definitions, designations, domestic, interconnection, international, operator, terminology, X interface.

FOREWORD

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

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

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

NOTE

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

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Introduction

This Recommendation defines designations and additional information intended primarily for human-to-human communication between various Operators, i.e., network operators or service providers.

The area of interest is the communication between operators about network interconnections and network services. The objects of communication are network interconnection points, places, stations, nodes, interconnection links, and terminating and originating connections and transit connections, etc. Correct terms for these are provided by the application schema defined in this Recommendation.

This Recommendation focuses on human needs for stable and recognizable data formats independently of what media they are communicated over. Therefore, in order to support the human-to-human communication, the formats defined in this Recommendation are required to be provided at the corresponding human-to-computer interfaces, as well. Hence, this Recommendation defines the presentation formats of data at human-to-computer interfaces, but does not define the data communication formats for interfaces between computer systems, such as at the TMN X interface or non-TMN computer interfaces. However, it should be possible in the future to automatically map the human-to-computer formats to the computer-to-computer formats and vice versa. The details of this mapping are for further study.

Use of this Recommendation within national jurisdictions may be imposed by the national regulator or may be the result of bilateral negotiation between the operators and/or national regulatory authorities, in accordance with national laws and regulations.

The Recommendation defines both designations and additional information to be exchanged between two Operators. However, this Recommendation focuses on information on Operators, network resources and their addresses, and does not define order or transaction identification or additional information on the status or processing of these orders or transactions.

The definition of information is common for the functions it supports. However, the selection of information defined in this Recommendation basically supports provisioning and network maintenance. In addition, this Recommendation may cover some information required for other TMN or non-TMN functions, such as ordering and billing.

This Recommendation aims at supporting communication between network operators, but may also support communication between network operators and service providers, brokers, retailers, customers and installation providers.

This Recommendation aims at defining designations and additional information for technicians and file support personnel at their terminals supporting the network, and serves as design information for developers of operational support systems.

This revision to ITU-T Rec. M.1401 (05/2005) replaces every occurrence of 'Town' with 'Geographical Area' on the basis of 'Geographical Area' being more applicable for the termination of routes than 'Town'. In addition, this revision aligns ITU-T Rec. M.1401 more closely with the ATIS Standard for location identification, which is not restricted to a town.

Also, text for several data items is repositioned in keeping with the alphabetical sequence of attribute groups and attributes as stated in Clause 5, Conventions.

ITU-T Recommendation M.1401

Formalization of interconnection designations among operators' telecommunication networks

1 Scope

The area of interest is the communication between operators about network interconnections. The objects of communication are network interconnection points, places, stations, nodes, interconnection links, and terminating and originating connections and transit connections, etc. This Recommendation contains definitions of those terms in the application schema.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

- [1] ITU-T Recommendation M.1400 (2006), *Designations for interconnections among operators' networks*.
- [2] ITU-T Recommendation T.50 (1992), *International Reference Alphabet (IRA) (Formerly International Alphabet No. 5 or IA5) – Information technology – 7-bit coded character set for information interchange*.
- [3] ITU-T Recommendation T.51 (1992), *Latin based coded character sets for telematic services*.
- [4] ITU-T Recommendation T.52 (1993), *Non-latin coded character sets for telematic services*.
- [5] ISO 3166-1:1997, *Codes for the representation of names of countries and their subdivisions – Part 1: Country codes*.

3 Definitions

This Recommendation is comprised of structured definitions in the context of an application schema graph.

4 Abbreviations

This Recommendation uses the following abbreviations:

ICC	ITU Carrier Code
SDH	Synchronous Digital Hierarchy
TMN	Telecommunication Management Network

5 Conventions

Figure 1 shows boxes containing object class labels to indicate object classes. Lines supported with a reversed arrowhead indicate subordinate object classes. Lines with two-way arrows indicate references between object classes. A dashed one-way arrow with an S at the arrowhead indicates a schema reference and is here used for stating recursion.

The text that follows Figure 1 includes a label and explanation for each class in the schema. A class can be an object class, an attribute class, or a reference class. The level of each class is depicted in the text by indentations (5 mm) of the class label, supported with dashes, where the number of indentations and dashes indicates the level of a given class within the schema. Therefore, each class label has a given indentation based on the Figure 1 schema graph.

Labels of data items that are subordinate to or referenced from a given object class are presented in the following sequence:

- 1) alphabetized object class attributes;
- 2) alphabetized object class references; and
- 3) alphabetized object classes that are contained within the given object class at the next lower level.

Textual definitions and explanations of object classes, attributes and references are provided in paragraphs that are adjusted 5 mm further to the right of their respective labels.

Object class labels are underlined; attribute group and attribute labels are not underlined. Object class references are written in blue, italics and underlined.

The formalism used in this Recommendation is introduced in Appendix III.

Data attributes other than Local identifiers consist of sequences of characters taken from Table 1/T.50, each character being either alphabetic (A-Z) or numeric (0-9). Local identifiers consist of sequences of characters which may include characters from other character sets (for example, the non-Latin characters in ITU-T Rec. T.52), on the basis of appropriate bilateral and/or multilateral agreements. Additional requirements for symbols are explicitly stated in format requirements for specific attributes. It is recommended that alphabetic characters be represented with upper-case letters unless stated otherwise.

ITU-T Rec. M.1401 (07/2006)

6 Application schema

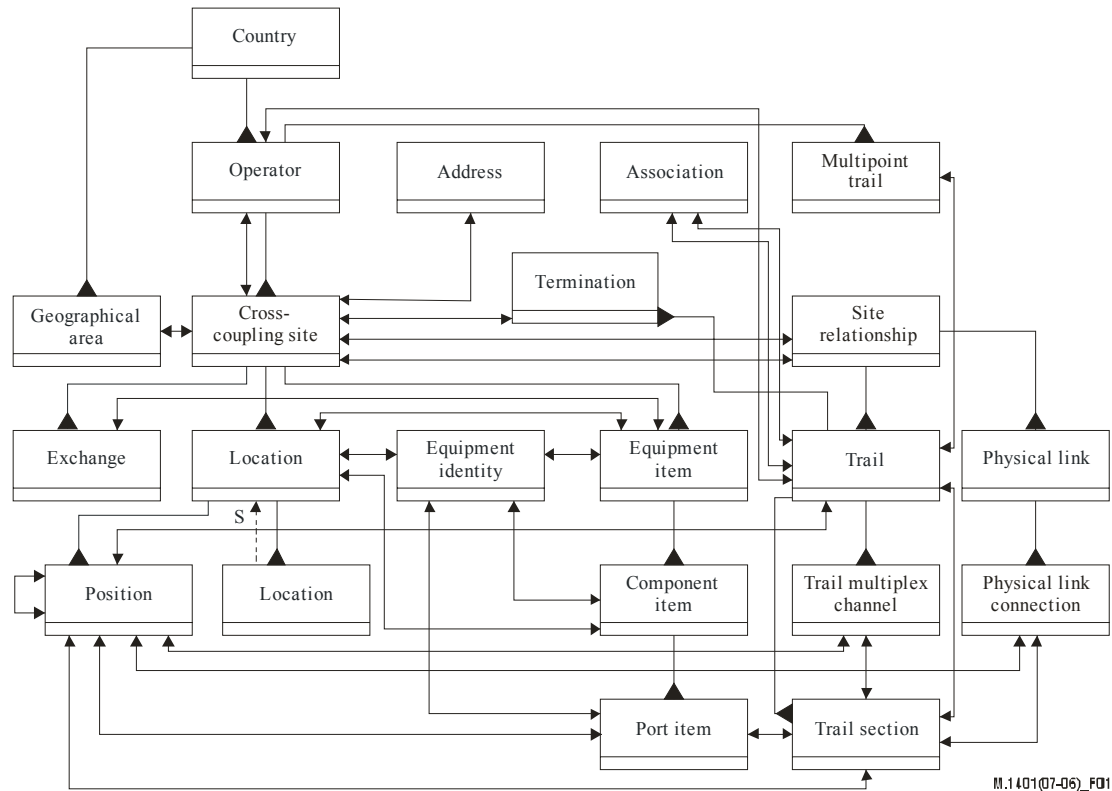


Figure 1/M.1401 – Application schema graph, depicting object classes (boxes), containment (reversed arrowheads) and references (two-way arrows)

Address

An Address identifies a geographic location, which may contain a Cross-coupling site.

- Site

An Address' subordinate Site is a role of a Cross-coupling site that is placed at the Address. An Address may have several Sites.

Association

An Association defines an ordered or unordered relationship between a Trail and some other Trails. The ordering is indicated by the Superior trail reference.

- Kind

Kind is indicating the usage of the Association. Kind is a 2-character field, adjusted to the left. S indicates reserve. In this case, Superior trail indicates the main trail, and Trail indicates the reserve trail.

- Superior trail

An Association's subordinate Superior trail is a role of a Trail that controls the Association. In case of an ordered relationship, the Association will have one and only one Superior trail. In case of an unordered relationship, the Association will have no Superior trail.

- Trail

An Association's subordinate Trail is a role of a Trail being controlled by the Association. An Association must have one or more Trails. In case of an unordered relationship, the Association will have two or more Trails.

Country

A Country with its Name and Country Code is defined in ISO 3166-1.

Operators within a Country are recognized and identified by the national regulatory authorities within that Country.

- Code

The Country Code is a 3-character globally unique code that identifies each Country according to ISO 3166-1.

- Name

The Country Name identifies a Country, dependency, or other area of particular geopolitical interest. Countries are assigned a globally unique Name in ISO 3166-1.

- Geographical area

Geographical area defines a geographical or administrative area defined by the authorities of that Country.

- Name

Name of the Geographical area as spelled by the authorities in that Country, i.e., in a national language of that Country. Note that different spellings dependent on the user are not permissible. Geographical area Name has up to 12 characters. Upper- and lower-case letters are permitted. Symbols that may be included in Geographical area Name are hyphen (-), underscore (_) and space (). In case the spelling given by the authorities exceeds 12 characters is not unique with 12 characters only, the Administration in that Country is responsible for assigning a unique identifier.

- Site

A Geographical area's subordinate Site is a role of a Cross-coupling site subordinate to Operator.

This referenced Cross-coupling site's Identifier contains the Geographical area Name.

- Operator

For this Recommendation, an Operator is an organization responsible for identification and management of telecommunication resources. The Operator must be legally recognized by the telecommunication Administration of the Country, or delegation thereof. An Operator may or may not correspond to a trading partner.

For this Recommendation, an Operator can be a network operator or service provider.

Both the national authority and the Operators should note that each Operator would be registered as a separate entity in each Country in which it operates, and is required to report country-specific information to each national authority. This may or may not imply a need for a multinational Operator to use different ICCs in each Country. Multinational Operators are encouraged to ensure that they are registered in each Country in which they operate.

- ICC

The ITU Carrier Code provides a unique identifier of an Operator within a Country. The assignment of ICCs may be delegated to a lower-level regional administration (for example, a province).

The ICC is used as an indispensable part in the assignment of identifiers for interworking between Operators. It is permissible that an operator uses one ICC for assignment of identifiers, while other operator codes are used for ordering, billing, etc.

ICC is a 1- to 6-character alphanumeric field.

See Appendix I on registration of ICCs.

- ▪ Controlled site

An Operator's subordinate Controlled site is a role of a Cross-coupling site that is currently owned by the Operator, but not identified locally to this Operator. If the Operator owns Cross-coupling sites that are not identified locally to this Operator, this reference has to be explicitly provided.

- ▪ Controlled trail

An Operator's subordinate Controlled trail is a role of a Trail being controlled by the Operator. An Operator may have many Controlled trails. Note that Controlled trail indicates responsibility for maintenance and not ownership.

- ▪ Cross-coupling site

The Cross-coupling site allows termination of a Trail, e.g., in an exchange, at a subscriber's premises or other. In case of termination of the Trail, e.g., at the subscriber's premises or in an international transmission centre, the Operator's network is considered to exist at one side of the Cross-coupling site only, i.e., the Operator's network may not include the connection between the Cross-coupling site and the customer's equipment.

The Cross-coupling site allows cross-couplings to route a Trail through that node, and the Cross-coupling site allows cross-couplings between Trails within that Cross-coupling site. The cross-coupling may use internal equipment, termination points and internal Trails which are associated to the routed Trail.

The cross-couplings may be provided by automated management, e.g., in digital cross-connect or SDH network matrixes, or the cross-connect can be made manually as in a fibre matrix. However, a Cross-coupling site typically may contain more than a single piece of such Equipment items, and the individual Equipment item should not be registered as a Cross-coupling site.

A Cross-coupling site can be a transmission station, a radio station, a base station, an earth station, a distribution frame, or a junction box, which as a special case can be an end junction box.

A control station or sub-control station can be registered as a Cross-coupling site even if it may not provide for cross-couplings within that site.

A Cross-coupling site cannot be geographically distributed over more than one building. However, it is also permissible to define several Cross-coupling sites at the same Address. In this case, separate Trails and other resources shall be defined to route Trails between these Cross-coupling sites at the same Address.

A cross-coupling within a Cross-coupling site is typically made on the basis of a cross-coupling or routing order. Hence, the cross-couplings are considered to be semi-permanent. Junctions which contain permanent cross-couplings or permanently installed equipment, are not Cross-coupling sites. Note that this permanently installed equipment outside Cross-coupling sites may still be subject to automatic surveillance by management functions.

A Cross-coupling site may contain one or more Exchanges, concentrators, routers and other equipment.

- ▪ ▪ Identifier

The Identifier uniquely identifies the Cross-coupling site within the scope of an Operator. Cross-coupling sites of different Operators, e.g., in the same room, shall be defined as separate Cross-coupling sites. However, if the place is managed by one Operator only, the place should be defined as one Cross-coupling site locally to that Operator. The other Operator's Equipment items, Exchanges and Locations shall then be identified locally to this Operator's Cross-coupling site. Hence, registration of ownership of Equipment items is distinguished from naming of the Equipment items within the Cross-coupling site.

Aliases of Cross-coupling site Identifiers are not permitted for communication between Operators of different Countries. However, Operators may exchange Local identifiers that are local to a specific Operator, country or region.

Note that some Operators may use the name of the Geographical area, or an abbreviation for this, as a part of the Cross-coupling site Identifier or for some of their Cross-coupling site Identifiers, while other Operators may not. The name of the Geographical area, if any, will additionally be provided in the Cross-coupling site's subordinate Address.

- ▪ ▪ ▪ Geographical area

The Name of the Geographical area being referenced in the Cross-coupling site's subordinate Geographical area. See field length and use of characters in this Name.

- ▪ ▪ ▪ Site detail

An identifier of the Cross-coupling site that is at least unique within a Geographical area and an Operator. This requirement does not prohibit that someone choose to make the identifier independent of Geographical area or Operator. The identifier has up to six characters. Symbols that may be included are hyphen (-), underscore (_) and space ().

- ▪ ▪ Local identifier

An identifier of the Cross-coupling site that is unique within an Operator, having up to 18 alphabetic and/or numeric characters. A Local identifier is specific to an Operator, country or region. Such use of Local identifiers would be subject to national regulation and/or bilateral agreement between Operators, as stated in ITU-T Rec. M.1400.

- ▪ ▪ [Address](#)

A Cross-coupling site's subordinate Address is a role of an Address denoting a geographical location. A Cross-coupling site has one Address only, which is the physical location address of the Cross-coupling site.

Note that the Cross-coupling site's subordinate Exchanges, Locations and Equipment items do not have separate references to Addresses, but their detailed addresses may be provided in address notes.

- ▪ ▪ [A-end site relationship](#)

A Cross-coupling site's A-end site relationship is a role of a Site relationship, of which the Cross-coupling site is referenced as an A-end site. A Cross-coupling site may have multiple A-end site relationships.

- ▪ ▪ [B-end site relationship](#)

A Cross-coupling site's B-end site relationship is a role of a Site relationship, of which the Cross-coupling site is referenced as a B-end site. A Cross-coupling site may have multiple B-end site relationships.