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SERIES M: TELECOMMUNICATION MANAGEMENT, INCLUDING TMN AND NETWORK MAINTENANCE

Designations and information exchange

Formalization of orders for interconnections among operators' networks

ITU-T Recommendation M.1404

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ITU-T Recommendation M.1404

Formalization of orders for interconnections among operators' networks

Summary

ITU-T Recommendation M.1404 defines orders and additional information intended primarily for human-to-human communication between various operators, i.e., network operators or service providers.

The orders contain data for designations of interconnections and other information about network resources that are required to be communicated between operators.

This Recommendation extends ITU-T Recommendation M.1401 and ensures use of M.1401 in orders containing designations of interconnections among operators' networks.

This Recommendation is developed in order to facilitate computerized interoperation between telecommunication operators.

Source

ITU-T Recommendation M.1404 was approved on 6 August 2007 by ITU-T Study Group 4 (2005-2008) under the ITU-T Recommendation A.8 procedure.

Keywords

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

FOREWORD

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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.

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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 order designations and additional information intended primarily for human-to-human communication between various operators, e.g., network operators, within the context of an external terminology schema in end-user terminology.

The area of interest is the communication of orders between operators about network interconnections and network services. These orders may also be relevant for network planning and installation companies and other entities. The objects of communication are network interconnection points, places, stations, nodes, etc., interconnection links, and terminating and originating connections and transit connections. These terms are defined in [ITU-T M.1400] and [ITU-T M.1401].

This Recommendation focuses on human needs for stable and recognizable data formats independently of the 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 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 must be possible 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 inside national jurisdictions will be the result of bilateral negotiation between the operators and/or national regulatory activity. Although compliance with all ITU-T Recommendations is voluntary, special mention is made for [ITU-T M.1404] due to the sensitivity of designations for interconnection from a regulatory and legal standpoint. This extension greatly increases the number of routes and nodes to be identified, and in this way extends the name spaces to be provided.

This Recommendation defines orders and additional information to be exchanged between two operators. While it defines order and message identification, it does not define data on the status or processing of these orders or messages. In this regard, this Recommendation can be considered as an adaptation or extension of ICT industry standards, e.g., OASIS UBL. ICT industry standards for such data may impose additional requirements on human-to-computer interfaces.

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.

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.

ITU-T Recommendation M.1404

Formalization of orders for interconnections among operators' networks

1 Scope

The area of interest is the communication of orders between operators about network interconnections. The objects of communication are network interconnection points, places, stations, nodes, etc., interconnection links, and terminating and originating connections and transit connections. These terms are defined in [ITU-T M.1400] and [ITU-T M.1401].

The focus of this Recommendation is on end-user terminology, as defined in an external terminology schema, which puts requirements on other schemata and implementations.

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.

[ITU-T M.1400] ITU-T Recommendation M.1400 (2006), *Designations for interconnections among operators' networks*.

[ITU-T M.1401] ITU-T Recommendation M.1401 (2006), *Formalization of interconnection designations among operators' telecommunication networks*.

[ITU-T M.1403] ITU-T Recommendation M.1403 (2007), *Formalization of generic orders*.

[ISO 3166-1] ISO 3166-1:2006, *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 external terminology schema graph.

This Recommendation uses all definitions in [ITU-T M.1401], provides an additional order structure to these definitions, and provides correspondences between the two structures.

4 Abbreviations

This Recommendation uses the following abbreviations:

ICC ITU Carrier Code

ICT Information and Communication Technology

OASIS Organization for the Advancement of Structured Information Standards

TMN Telecommunication Management Network

UBL Universal Business Language

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 to state instance-class correspondences between Messages. "&" states recursively superior node, while "(" states subordinate node. Hence, the used expression states a schema reference from any to any Message.

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.

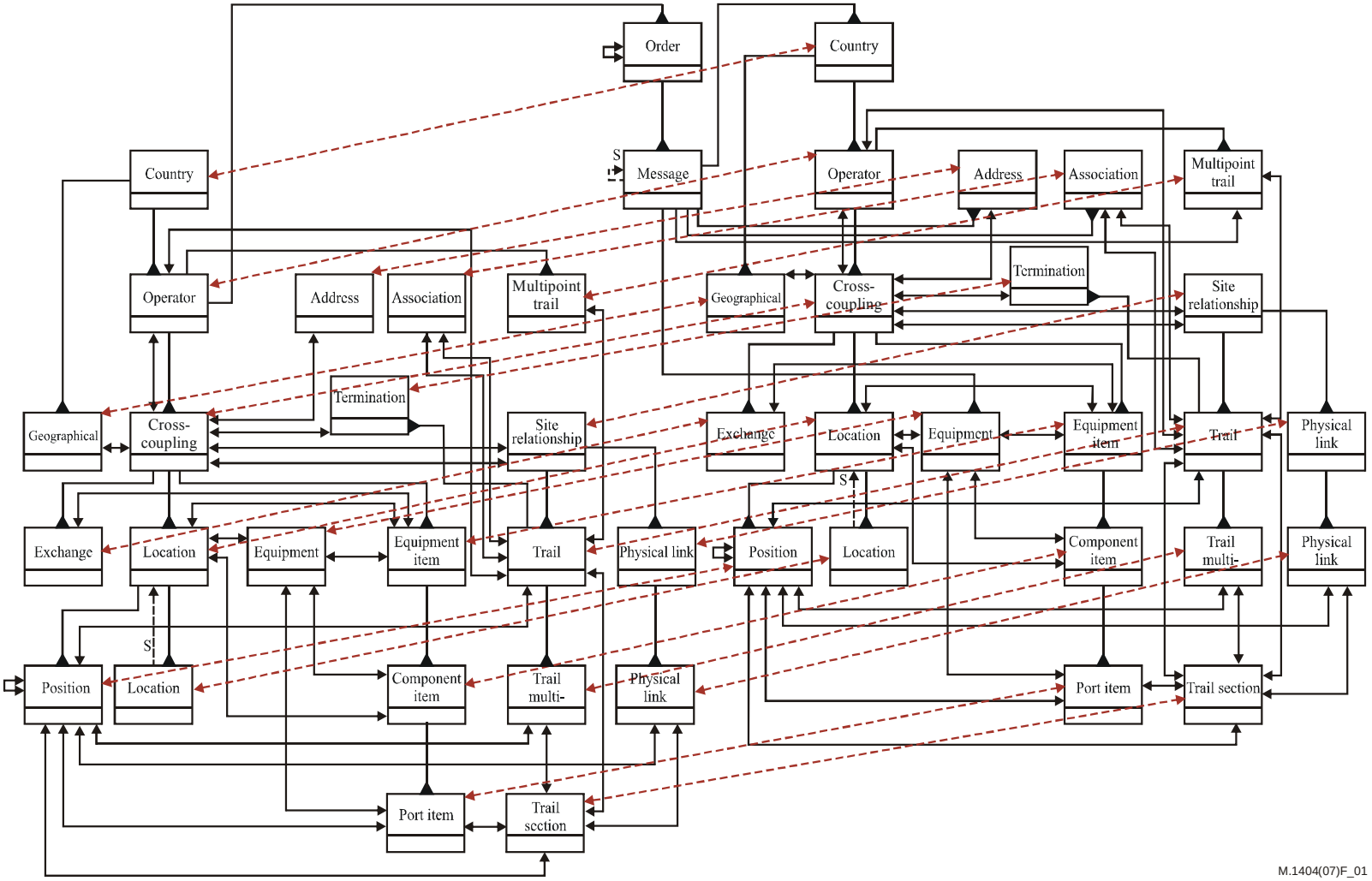
Object class labels are underlined; attribute group and attribute labels are not underlined. Object class references are written in blue, italics and underlined.

The formalism used in this Recommendation is introduced in Appendix III of [ITU-T M.1401].

Data attributes shall consist of sequences of characters, each character being either alphabetic (A-Z) or numeric (0-9). 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.

Brown dotted lines indicate references between the main register part and the order register part. Brown textual references indicate references between the main register part and the order register part.

6 External terminology schema



NOTE – The left-hand part is identical to [ITU-T M.1401]. Except for Order and Message and their references, the right-hand part is a copy of the same. The brown arrows show the correspondences. Country may be contained in Corporation; this is not elaborated in this Recommendation.

Figure 1 – External terminology schema graph, depicting object classes (boxes), containment (reversed arrowheads) and references (two-way arrows)

Address

- *Address*
- *Site*

Association

- Kind
- *Superior trail*
- *Trail*

Country

See [ITU-T M.1401].

- *Country*
- Name

  See [ITU-T M.1401].
- Code

  See [ITU-T M.1401].
- Operator

  See [ITU-T M.1401].
- - *Operator*
- - ICC

    See [ITU-T M.1401].
- - Controlled site
- - *Controlled trail*
- - Cross-coupling site
- - - *Cross-coupling site*
- - - Identifier
- - - - Geographical area
- - - - Site detail
- - - Local identifier
- - - *Address*
- - - *A-end site relationship*
- - - *B-end site relationship*
- - - *Current operator*
- - - *Termination*
- - - *Geographical area*
- - - Equipment item
- - - - *Equipment item*
- - - - Identifier

- Unique item identification
- *Equipment identity*
- *Exchange*
- *Location*
- Component item
- *Component item*
- Identifier
- Unique item identification
- *Equipment identity*
- *Location*
- Port item
- *Port identity*
- Identifier
- *Equipment identity*
- *Position*
- *Trail section*
- Exchange
- *Exchange*
- No
- *Equipment item*
- Location
- *Location*
- Identifier
- Unique item identification
- *Component item*
- *Equipment item*
- Location
- *Location*
- *S<> 'Location' Location*
- Position
- *Position*
- Identifier
- *Physical link connection*
- *Port item*
- *Position*
- *Trail*
- *Trail multiplex channel*

▪ ▪ ▪ ▪ ▪ *Trail section*

▪ ▪ Order

See [ITU-T M.1403].

▪ ▪ ▪ Number

See [ITU-T M.1403].

▪ ▪ ▪ *Derived order*

See [ITU-T M.1403].

▪ ▪ ▪ *Served order*

See [ITU-T M.1403].

▪ ▪ ▪ Message

See [ITU-T M.1403].

▪ ▪ ▪ ▪ Type

See [ITU-T M.1403].

▪ ▪ ▪ ▪ *S <>'& (((Order (Message*

See [ITU-T M.1403].

▪ ▪ ▪ ▪ Address

▪ ▪ ▪ ▪ ▪ *Address*

▪ ▪ ▪ ▪ ▪ *Site*

▪ ▪ ▪ ▪ Association

▪ ▪ ▪ ▪ ▪ Kind

▪ ▪ ▪ ▪ ▪ *Superior trail*

▪ ▪ ▪ ▪ ▪ *Trail*

▪ ▪ ▪ ▪ Country

▪ ▪ ▪ ▪ ▪ *Country*

▪ ▪ ▪ ▪ ▪ Name

▪ ▪ ▪ ▪ ▪ Code

▪ ▪ ▪ ▪ ▪ Operator

▪ ▪ ▪ ▪ ▪ ▪ *Operator*

▪ ▪ ▪ ▪ ▪ ▪ ICC

▪ ▪ ▪ ▪ ▪ ▪ *Controlled site*

▪ ▪ ▪ ▪ ▪ ▪ *Controlled trail*

▪ ▪ ▪ ▪ ▪ ▪ Cross-coupling site

▪ ▪ ▪ ▪ ▪ ▪ ▪ *Cross-coupling site*

▪ ▪ ▪ ▪ ▪ ▪ ▪ Identifier

▪ ▪ ▪ ▪ ▪ ▪ ▪ ▪ Geographical area

▪ ▪ ▪ ▪ ▪ ▪ ▪ ▪ Site detail

▪ ▪ ▪ ▪ ▪ ▪ ▪ Local identifier

- *Address*
- *A-end site relationship*
- *B-end site relationship*
- *Current operator*
- *Termination*
- *Geographical area*
- Equipment item
  - *Equipment item*
  - Identifier
  - Unique item identification
  - *Equipment identity*
  - *Exchange*
  - *Location*
- Component item
  - *Component item*
  - Identifier
  - Unique item identification
  - *Equipment identity*
  - *Location*
- Port item
  - *Port item*
  - Identifier
  - *Equipment identity*
  - *Position*
  - *Trail section*
- Exchange
  - *Exchange*
  - No
  - *Equipment item*
- Location
  - *Location*
  - Identifier
  - Unique item identification
  - *Component item*
  - *Equipment item*
- Location
  - *Location*

- *S<> 'Location' Location*
- Position
- *Position*
- Identifier
- *Physical link connection*
- *Port item*
- *Position*
- *Trail*
- *Trail multiplex channel*
- *Trail section*
- Multipoint trail
- *Multipoint trail*
- Identifier
- Local identifier
- *Trail*
- Geographical area
- *Geographical area*
- Name
- *Site*
- Equipment identity
- *Equipment identity*
- Identifier
- *Component item*
- *Equipment item*
- *Location*
- *Port item*
- Site relationship
- *Site relationship*
- Identifier
- A-end
- Country Code
- ICC
- Site
- B-end
- Country Code
- ICC
- Site

- Local identifier
  - A-end
  - B-end
- *A-end site*
- *B-end site*
- Physical link
  - *Physical link*
  - Identifier
  - Physical link connection
    - *Physical link connection*
    - Identifier
    - *Position*
    - *Trail section*
- Trail
  - *Trail*
  - Identifier
  - Local identifier
  - Bandwidth
    - Maximum
      - Size
      - Unit
    - Actual
      - Size
      - Unit
  - Signalling
  - Urgency
    - Priority
    - Limit
    - Deadline
      - Date
        - Day
        - Month
        - Year
      - Time
        - Hour
- *Association*
- *Controller*

▪ ▪ ▪ ▪ ▪ ▪ *Multipoint trail*

▪ ▪ ▪ ▪ ▪ ▪ *Position*

▪ ▪ ▪ ▪ ▪ ▪ *Routing trail section*

▪ ▪ ▪ ▪ ▪ ▪ *Subordinate association*

▪ ▪ ▪ ▪ ▪ ▪ Termination

▪ ▪ ▪ ▪ ▪ ▪ ▪ Direction

▪ ▪ ▪ ▪ ▪ ▪ ▪ *Cross-coupling site*

▪ ▪ ▪ ▪ ▪ ▪ Trail multiplex channel

▪ ▪ ▪ ▪ ▪ ▪ ▪ *Trail multiplex channel*

▪ ▪ ▪ ▪ ▪ ▪ ▪ Number

▪ ▪ ▪ ▪ ▪ ▪ ▪ *Position*

▪ ▪ ▪ ▪ ▪ ▪ ▪ *Trail section*

▪ ▪ ▪ ▪ ▪ ▪ Trail section

▪ ▪ ▪ ▪ ▪ ▪ ▪ *Trail section*

▪ ▪ ▪ ▪ ▪ ▪ ▪ Identifier

▪ ▪ ▪ ▪ ▪ ▪ ▪ *Physical link connection*

▪ ▪ ▪ ▪ ▪ ▪ ▪ *Port item*

▪ ▪ ▪ ▪ ▪ ▪ ▪ *Position*

▪ ▪ ▪ ▪ ▪ ▪ ▪ *Trail*

▪ ▪ ▪ ▪ ▪ ▪ ▪ *Trail multiplex channel*

▪ ▪ Multipoint trail

▪ ▪ ▪ *Multipoint trail*

▪ ▪ ▪ Identifier

▪ ▪ ▪ Local identifier

▪ ▪ ▪ *Trail*

▪ Geographical area

▪ ▪ *Geographical area*

▪ ▪ Name

▪ ▪ *Site*

Equipment identity

▪ *Equipment identity*

▪ Identifier

▪ *Component item*

▪ *Equipment item*

▪ *Location*

▪ *Port item*

Site relationship

- *Site relationship*
- Identifier
- - A-end
- - - Country Code
- - - ICC
- - - Site
- - B-end
- - - Country Code
- - - ICC
- - - Site
- Local identifier
- - A-end
- - B-end
- *A-end site*
- *B-end site*
- Physical link
- - *Physical link*
- - Identifier
- - Physical link connection
- - - *Physical link connection*
- - - Identifier
- - - *Position*
- - - *Trail section*
- Trail
- - *Trail*
- - Identifier
- - Local identifier
- - Bandwidth
- - - Maximum
- - - - Size
- - - - Unit
- - - Actual
- - - - Size
- - - - Unit
- - Signalling
- - Urgency
- - - Priority

- Limit
- Deadline
- Date
- Day
- Month
- Year
- Time
- Hour
- *Association*
- *Controller*
- *Multipoint trail*
- *Position*
- *Routing trail section*
- *Subordinate association*
- Termination
- *Termination*
- Direction
- *Cross-coupling site*
- Trail multiplex channel
- *Trail multiplex channel*
- Number
- *Position*
- *Trail section*
- Trail section
- *Trail section*
- Identifier
- *Physical link connection*
- *Port item*
- *Position*
- *Trail*
- *Trail multiplex channel*

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