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Directory services

Unified Directory Specification

ITU-T Recommendation F.515

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ITU-T Recommendation F.515

Unified Directory Specification

Summary

This Recommendation provides a directory specification to fulfil the service requirements of ITU-T Rec. F.510. The directory specification is named Unified Directory Specification (UDS) to reflect that it allows a great variety of database structures to be supported. The ITU-T Rec. F.510 service is realized by the Unified Directory Access Protocol (UDAP). This protocol is expressed using the eXtensible Markup Language (XML) schema notation.

UDAP has been designed in a way that facilitates an easy mapping to ITU-T Rec. E.115.

The structure of this Recommendation follows the structure of ITU-T Rec. F.510. Certain clauses in ITU-T Rec. F.510 do not require a corresponding specification and are left void.

Source

ITU-T Recommendation F.515 was prepared by ITU-T Study Group 17 (2001-2004) and approved under the ITU-T Recommendation A.8 procedure on 22 April 2003.

FOREWORD

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Introduction

This Recommendation provides a directory specification to fulfil the service requirements of ITU-T Rec. F.510. The directory specification is named Unified Directory Specification (UDS) to reflect that it allows a great variety of database structures to be supported. The ITU-T Rec. F.510 service is realised by the Unified Directory Access Protocol (UDAP). This protocol is expressed using the eXtensible Markup Language (XML) schema notation.

UDAP has been designed in a way that facilitates an easy mapping to ITU-T Rec. E.115.

The structure of this Recommendation follows the structure of ITU-T Rec. F.510. Certain clauses in ITU-T Rec. F.510 do not require a corresponding specification and are left void.

Annex A, which is an integral part of this Recommendation, list the messages codes as defined in Annex A/F.510, and it lists the conditions under which they are generated and what additional information is associated with each message code.

Annex B, which is an integral part of this Recommendation, gives the formal specification of UDAP in XML schema notation.

Annex C, which is an integral part of this Recommendation, specifies how UDS uses underlying services.

Annex D, which is an integral part of this Recommendation, gives the formal specification of UDAP in ASN.1 notation.

An implementation shall implement the encoding specified either in Annex B, or in Annex D, or in both.

ITU-T Rec. F.515 (04/2003)

ITU-T Recommendation F.515

Unified Directory Specification

1 Scope

This Recommendation only considers directory information retrieval using the search operation. Requirements on administrative workstations or administrative capabilities are outside the scope of this Recommendation.

This Recommendation supports the Directory Service as specified by ITU-T Rec. F.510. However, it could be used in other environments.

This Recommendation considers only client to directory server communication. It does not consider directory server to directory server communication.

2 Normative 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 Recommendation E.115 (1995), *Computerized directory assistance*.
- ITU-T Recommendation F.510 (2003), *Automated directory assistance – White pages service definition*.
- ITU-T Recommendation X.693 (2001) | ISO/IEC 8825-4:2002, *Information technology – ASN.1 encoding rules: XML Encoding Rules (XER)*.
- ISO/IEC 10646-1:2000, *Information technology – Universal Multiple-Octet Coded Character Set (UCS) – Part 1: Architecture and Basic Multilingual Plane*.
- ISO 3166 (all parts), *Codes for the representation of names of countries and their subdivisions*.

3 Definitions

3.1 White pages service definitions

The following terms are defined in ITU-T Rec. F.510:

- a) (directory) attribute;
- b) (directory) entry;
- c) directory service;
- d) hierarchical group;
- e) key attribute;
- f) query service entry.

3.2 Unified directory definitions

This Recommendation defines the following terms:

3.2.1 client: An application that issues directory requests and receives directory information in responses.

3.2.2 directory server: An application that can return directory information when receiving request over the Unified Directory Access Protocol.

3.2.3 entry: A collection of directory attributes and families that comprises the information held about an object.

3.2.4 family: A grouping of related directory attributes within an entry.

3.2.5 filter: A construct carried in a search request to be matched against entry information.

3.2.6 filter item: A component of a filter that carries information to be matched against directory attributes of a particular type.

3.2.7 object: An entity, e.g., a person, that is represented by an entry of a directory server.

4 Abbreviations

This Recommendation uses the following abbreviations:

ASN.1	Abstract Syntax Notation One
DMD	Directory Management Domain
GSM	Global System for Mobile communications
IANA	Internet Assigned Numbers Authority
ISDN	Integrated Services Digital Network
LDAP	Lightweight Directory Access Protocol
PSTN	Public Switched Telephone Network
SMS	Short Message Service
SOAP	Simple Object Access Protocol
UDAP	Unified Directory Access Protocol
UDS	Unified Directory Specification
UMTS	Universal Mobile Telecommunications System
XML	eXtensible Markup Language

5 Conventions

5.1 Text conventions

There is terminology collision between that of directories and that of eXtensible Markup Language (XML). The terms attributes and schema are used in both environments. To avoid confusions, those two terms are qualified by "directory" or "XML", as appropriate.

This Recommendation presents XML notation in Courier New, 9-point typeface and ASN.1 in Courier New, 10-point typeface. When XML specifications are referenced in normal text, they are differentiated from other text by presenting them in the bold Courier New, 10-point typeface.

5.2 XML notation conventions

5.2.1 General on XML notation

All complex and simple XML types defined by this Recommendation have a name that starts with an uppercase letter.

All names of non-abstract XML elements defined by this Recommendation start with a lowercase letter.

All names of XML attributes defined by this Recommendation start with a lowercase letter.

All names of abstract elements start with uppercase letter.

5.2.2 Syntaxes with upper bounds

Most directory attribute types with string syntax has a maximum length, termed upper bound. Simple XML types, which specifies upper limits, are defined for that purpose.

The name of such a simple XML type is the letters **ub** plus a number, for example **ub64**, where the number indicates the upper bound in number of characters for the type. Such types are derived from the XML built-in **string** type.

5.2.3 Enumerated types

Some elements and XML attributes may take one out of several predefined values. Special XML simple types are defined for such element types.

The XML built-in type **NCName** is the base type for an enumerated type.

An XML enumerated simple type is named by taking a *descriptive name*, e.g., **AttributeType**. The first character of the name of such a simple type is an uppercase letter.

The value of an XML element or an XML attribute of the enumerated type shall be exactly one of the defined enumerated values.

5.2.4 List types

The XML list type facility is used where several values of an enumerated type may be required within a single XML element or XML attribute. An XML simple list type is given a *descriptive name* suffixed with an **s**, e.g., **AttributeTypes**. The first character of the name of such a simple type is an uppercase letter.

A value of this type holds zero or more of the defined enumerated values.

5.2.5 Abstract element schema definitions and substitution groups

Abstract XML element schema definitions are used as "head" elements for XML schema substitution groups. The first character of a name of an abstract XML element is an uppercase letter.

6 Directory service model

Figure 1 illustrates the position of the UDAP with respect to different components defined within clause 6/F.510. The protocol between the access service and the query service agent could be any private or standardized protocol. In particular, it could be UDAP as defined by this Recommendation. The query service agent may, dependent on circumstances, provide some of the ITU-T Rec. F.510 service elements. However, the UDAP supports the full set of ITU-T Rec. F.510 service elements.

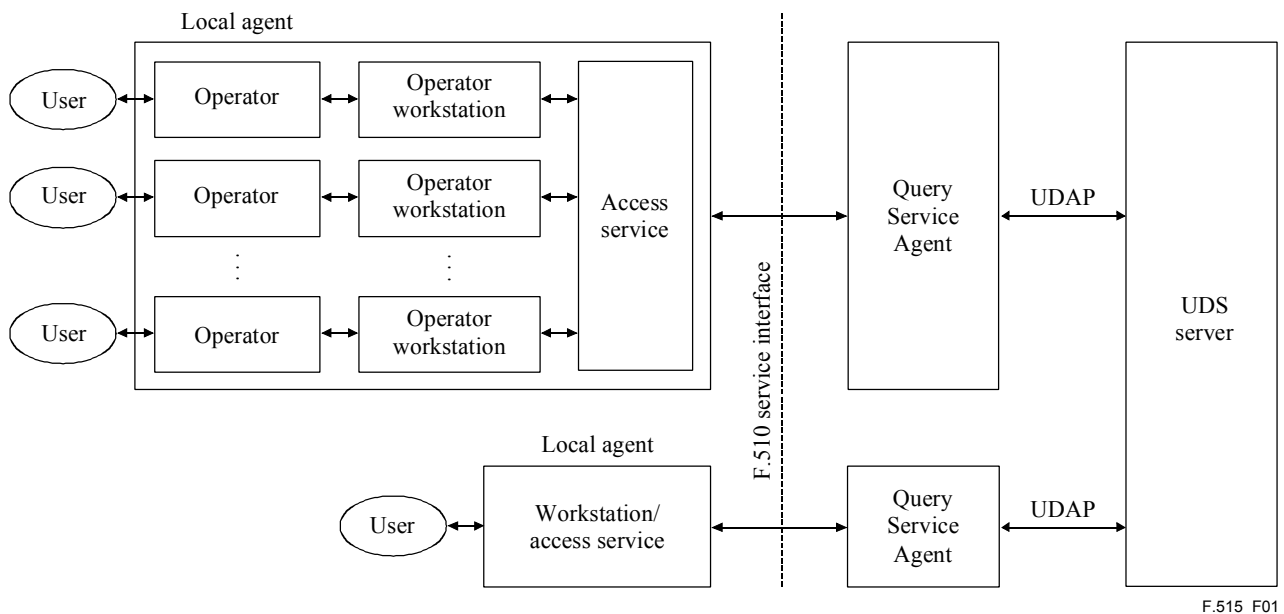


Figure 1/F.515 – Possible service scenarios

As the UDAP may be used in other places than indicated in Figure 1, the term *client* is used for the function that issues a UDAP request, and the term *directory server* is used for the function replying to a UDAP request with a response.

7 Directory information model

7.1 Information structure

7.1.1 Relationship to ITU-T Rec. F.510

ITU-T Rec. F.510 is a service definition for a White Pages service. However, it does not provide details on how this service should be realized. This Recommendation gives a directory specification for the support of ITU-T Rec. F.510. It is also able to cope with some future extensions to that Recommendation.

7.1.2 Entry structure

See Figure 2

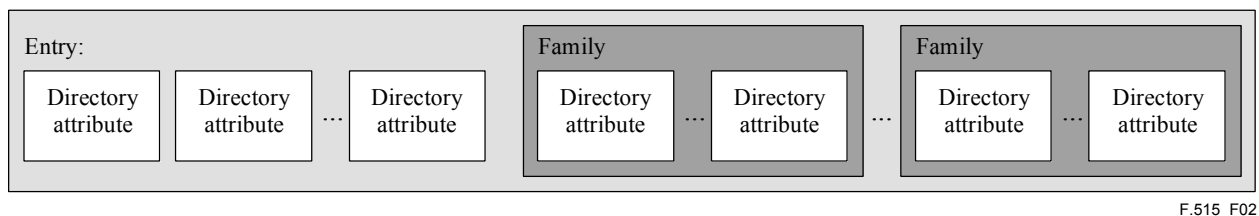


Figure 2/F.515 – Structure of a directory entry

A directory holds information about objects. The following object classes are defined:

- a) subscriber, which is either a residential person, an organization or a governmental institution;
- b) state-or-province;
- c) locality;
- d) street; and
- e) business category.

The collection of directory information about some object is called an entry. The entry model is only used for defining how directory information is transferred on the protocol. It does not imply anything about the internal structure of a database.

The information within an entry is modelled as a set of directory attributes and families.

Each directory attribute holds a particular piece of information, e.g., a street address. A particular directory attribute is an instance of a directory attribute type. A directory attribute type is a definition of the type of information held by an (instance) directory attribute of that type.

There may be multiple directory attributes of the same type within an entry. As an example, a locality name may be provided in different languages.

The content of directory entries corresponding the above different object classes is outlined in 7.2, 7.3 and 7.5.

A family is a grouping of related directory attributes that describes one particular entity, for example, a communications address (see 7.5.2). A particular family is an instance of a family type.

7.1.3 Directory attributes

7.1.3.1 Directory attribute type definitions

A directory attribute type is defined as an XML element type. The element name is a global unique identification of the directory attribute type. A directory attribute is an instance of this element type where the content of the element is the value of the directory attribute.

The following is a typical directory attribute specification:

```
<streetAddress xml:lang="da">Nakkedraget</streetAddress>
```

The syntax of the value is part of the element definition. Some directory attribute type definitions include the `xml:lang` XML attribute, which indicates the language of the directory attribute value. As an example, a street address in Brussels have both a French and a Flemish variant.

All the defined directory attribute types belong to the XML **Attribute** substitution group. This means that directory attributes can be inserted into the protocol whenever the **Attribute** abstract element is specified within the XML schema (as an example, see 7.1.4).

7.1.3.2 Grouping of directory attributes (families)

It is possible to define different family types. A family type is defined as an XML element type. The element name is a global unique identification of the family type. A family element has as child elements one or more elements of the XML **Attribute** substitution group.

A family type definition is member of the **Family** substitution group.

The only currently defined member of the **Family** substitution group is the `commsAddress` family type.

NOTE – Other family types could be defined in the future, e.g., for postal addresses.

7.1.4 Entry representation

Entry information, as it is transmitted in the protocol, is represented by the **entry** XML element (see Figure 3).

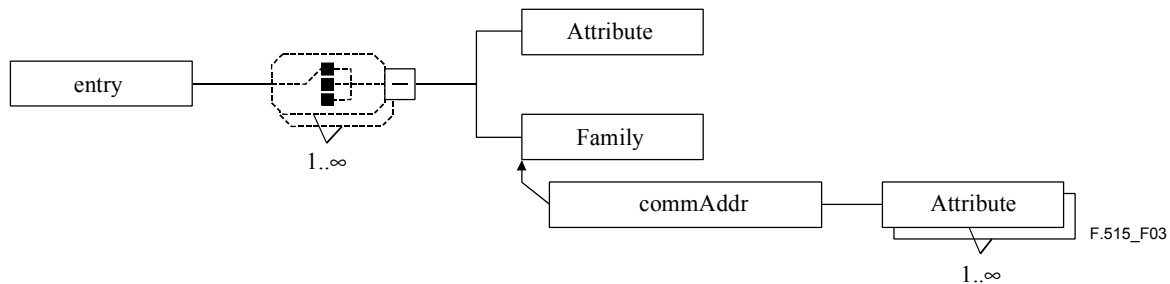


Figure 3/F.515 – Transmitted entry information

A child element of the **entry** element is a choice between an element of the **Attribute** substitution group and an element of the **Family** substitution group. This choice can be taken one or more times as indicated in above figure. This allows such elements to be present in any number and order.

The **entry** element has the following XML attributes:

- The **entryIdentifier** XML attribute allows an entry identifier to be assigned to the entry (see 7.1.5).
- The **hierarchyLevel** XML attribute shall be present for any entry that is a member of a hierarchical group. This XML attribute shall take the value zero for the hierarchical top.
- The **hierarchyBelow** XML attribute indicates whether the entry has any hierarchical children. A value of **true** indicates that hierarchical children exist. If the value is **false** or this XML attribute is absent, no hierarchical children exist.
- The **ReturnedObject** XML attribute indicates the type of entry returned. It can take the value **subscriber** (default), **stateOrProvince**, **locality**, **street** or **businessCategory**.

7.1.5 Entry identifiers

Clause 7.5/F.510 introduces the concept of *entry identifiers*. An entry identifier may be supplied in a UDAP search request (see 10.5.1.2). An entry identifier may also be supplied for some or all of the entries returned in a search result.

ITU-T Rec. F.510 mandates the support of entry identifiers, but support is optional according to this Recommendation. However, if an implementation is able to return identification information in the results, it shall also support identification information in the requests.

Entry identifier can be used for accessing a particular entry directly. It can also be used to establish relationship among members of a hierarchical group.

Some databases have external visible identifiers that can be used as permanent entry identifiers; others have not. Although a database may not provide for such permanent entry identifiers, the directory server may assign temporary entry identifiers to entries returned. The client can then within a locally defined period use an entry identifier to access a particular entry.

The entry identifier is given as an XML attribute with syntax **xsd:base64Binary** allowing any bit string to be represented.

This XML attribute is mandatory for the **base** child element of the **searchRequest** and it is optional for the **entry** element of the **searchResult**.

If the client in a request specified an expired or unknown entry identifier, the directory server shall return an empty result with message code 0.1.

7.1.6 Search filter

7.1.6.1 Filter concept

A **filter** element is part of a search request. It consists of *filter items*. A filter item holds directory attribute information about a particular directory attribute type. The directory server compares this information against corresponding directory attribute(s) within each entry of the directory server. If the filter item matches just one directory attribute of the type, whether that directory attribute is a direct part of the entry or is contained within a family, the matching returns a value of TRUE. Otherwise; it returns a value of FALSE. If the combination of filter element results in a TRUE condition, the entry is a candidate to be returned in the search result. Otherwise, it is not.

NOTE 1 – Although an entry is a candidate to be returned, local policies may prevent that entry from being returned.

NOTE 2 – Currently, only AND'ing of filter element is supported, i.e., that all filter items have to return TRUE for the filter to return TRUE. The filter specification is made in such a way that extension to more complex and powerful filter specifications is possible.

A filter item can hold a complete directory attribute value. This shall be the case for all enumerated directory attribute types. In this case the filter item is represented by an XML element of the **Assertion** substitution group. A filter item can also hold one or more, possible truncated words to be matched against a string-type directory attribute. In this case the filter item is represented by an XML element of the **Substrings** substitution group.

7.1.6.2 Filter structure

A filter is carried in a search request in the **filter** XML element. Its structure is indicated in Figure 4. A child element of the **filter** element is a filter item that is defined as a choice between an element of the **Assertion** substitution group and an element of the **Substrings** substitution group. This choice can be taken one or more times. This allows multiple of such elements to be specified in any order

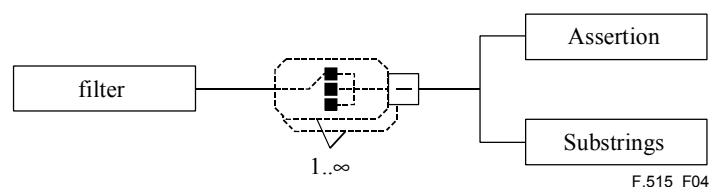


Figure 4/F.515 – Filter structure

7.1.6.3 Directory assertion definitions

A separate version of the directory attribute definition is used for defining elements of the **Assertion** substitution group. The suffix **As** is added to the element name of the corresponding basic directory attribute definition to separate it from that definition.

The following is a typical assertion specification:

```
<subscriberTypeAs weight="...">residential</subscriberTypeAs>
```

In this example, the **subscriberTypeAs** is an enumerated that can take the value **residential**, **organization** or **government**.

An **Assertion** type element has the **weight** XML attribute, which may affect the result of the evaluation (see 9.9).

7.1.6.4 Directory substrings/word matching definitions

A separate version of the directory attribute definition is used for defining elements of the **Substrings** substitution group. The suffix **sub** is added to the element name of the corresponding basic directory attribute definition used to distinguish it from that definition.

Figure 5 illustrates the XML schema for an XML element of the **Substrings** substitution group. It consists of a global XML element with a name following the rules indicated above and it has as child elements one or more **value** elements.

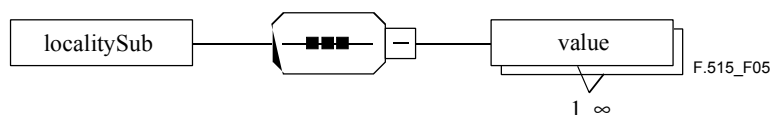


Figure 5/F.515 – Typical substrings definition

The content of each **value** child element is a word, possibly truncated.

The global element has two XML attributes:

- The **weight** XML attribute has the same significance as for an element of the **Assertion** substitution group.
- The **string** attribute indicates the string matching rule as requested by the client (see 9.2.4/F.510).

A **value** element has two XML attributes:

- The **wordMatch** XML attribute indicates the word matching rule as requested by the client (see 9.2.3/F.510).
- The **characterMatch** XML attribute indicates the character matching rule as requested by the client (see 9.2.2/F.510).

Details on matching rule specifications can be found in 9.2.

7.1.7 Defined directory attribute types

This Recommendation defines directory attribute types in 7.2 and 7.5 corresponding to the attribute types defined in ITU-T Rec. F.510.

The directory attributes are listed in tables where the columns have the following meanings:

- The Directory attribute type column gives the name of the directory attribute type, which is also the name of the XML element type representing the directory attribute type.
- The Syntax column gives the syntax used for a directory attribute value of the type.
- The Match type column indicates what type of filter item is used for the directory attribute type. 'As' means that the element of the **Assertion** substitution group has been defined for the directory attribute type. 'Sub' means that the element of the **Substrings** substitution group has been defined for the directory attribute type. '-' means that matching is not relevant for the attribute type.
- The Language attribute column indicates whether the **xml:lang** XML attribute has been included in the definition of the base directory attribute type. 'Y' means it has been included, 'N' means it has not been included and '-' means that a language code is not relevant.
- The Use column gives a little explanation on the use of the directory attribute type.

7.2 Geography

See Table 1.

Table 1/F.515 – Geography Locality directory attributes

Directory attribute type	Syntax (XML type)	Match type	Language attribute	Use
Country	NMTOKEN	As	–	Specifies the ISO 3166-1 code for the country.
Locality	Ub128	Sub	Y	Specifies the name of a locality.
stateOrProvince	Ub128	Sub	Y	Specifies the name of a state or province.
description	Ub1024	–	Y	Specifies free-form text that describes the Returned Object.
localityCode	Ub64	As	–	Specifies a common code to identify a geographical locality.
localityNDC	Num-ub16	As	–	Specifies the value of a field within the ITU-T Rec. E.164.

Table 1/F.510 lists the directory attributes corresponding to the attribute types as they are defined in 7.2/F.510. The ITU-T Rec. F.510 attribute type NoSubscriberInformation is indirectly signalled by the **returnedObject** XML attribute of the **entry** element having a value different from **subscriber**.

7.3 Business classification

No specification beyond ITU-T Rec. F.510 is needed.

7.4 Organizational structure

No specification beyond ITU-T Rec. F.510 is needed.

7.5 Subscriber entry

See Table 2.

Table 2/F.515 – Subscriber directory attributes

Directory attribute type	Syntax (XML type)	Match type	Language attribute	Use
streetAddress	Ub128	Sub	Y	Specifies a site for the local distribution and physical delivery in a postal address, i.e., the street name, place, avenue, etc.
houseId	Ub64	Sub	N	Specifies a linguistic construct used to identify a particular building, for example a house number or house name relative to a street, avenue, town or city, etc.
givenName	Ub64	Sub	N	Specifies the linguistic construct which is normally given to an individual by the individual's parent, or is chosen by the individual, or by which the individual is commonly known.

Table 2/F.515 – Subscriber directory attributes

Directory attribute type	Syntax (XML type)	Match type	Language attribute	Use
title	Ub64	Sub	Y	Specifies the designated position or function of the object within an organization.
description	Ub1024	–	Y	Specifies free-form text that describes the returned subscriber entry.
businessCategory	Ub128	Sub	Y	Specifies information concerning the occupation of some common objects, e.g., people. For example, this directory attribute provides the facility to interrogate the directory about people sharing the same occupation.
postalCode	Ub40	Sub	–	Specifies the postal code of the named object.
postOfficeBox	Ub40	Sub	–	Specifies the Post Office Box by which the object will receive physical postal delivery.
dmdName	Ub64	Sub		Specified a service provider name that has to be unique within a certain scope, e.g., within a country or Europe.
localityCode	Ub64	As	–	Specifies a common code to identify a geographical locality.
nationalDestination Code	Num-ub16	As	–	Specifies the value of a field within ITU-T Rec. E.164.
subscriberName	Ub128	Sub	Y	Specifies the name by which the Subscriber chooses to be known in the directory. The subscriberName is the surname for a residential subscriber and organizational name for an organizational or governmental subscriber.
subscriberType (Note)	SubscTypes	As	–	Specifies the type of subscriber. It is defined as a multi-valued directory attribute type allowing a subscriber to be simultaneously of multiple types.
secondFamilyName	Ub128	Sub	N	Specifies a residential subscriber when subscriberName is not sufficiently unique
profession	Ub128	Sub	Y	Specifies the profession or job of an individual, business or department.
language	language	As	–	Specifies the preferred language in which the subscriber entry shall be displayed.
NOTE – The XML syntax is a list of enumerated values. It is therefore possible to add several values to a single XML attribute element.				

7.5.1 Subscriber types

The **subscriberType** directory attribute gives the type of the subscriber. The different subscriber types are described in 7.5.1/F.510. The directory attribute syntax is the **SubscrTypes** simple XML type. It is a list item type derived from the enumerated **SubscrType** XML simple type. The **SubscrType** defines the following enumerated values:

- **residential**;
- **organization**;
- **government**.

It is possible to specify multiple subscriber types, e.g., in the case the same communications address is for both organizational and private use.

7.5.2 Communications address

See Table 3.

Table 3/F.515 – Communication address directory attributes

Directory attribute type	Syntax (XML type)	Match type	Language attribute	Use
telephone	Ub32	Sub	–	Specifies a telephone number associated with an object. A directory attribute value for Telephone Number is a string that complies with the internationally agreed format for showing international telephone numbers, ITU-T Rec. E.123 (e.g., "+ 44 582 10101").
orAddress	ub1024	Sub	–	Specifies a text encoding of an X.400 O/R address, as specified in RFC 987.
mail	ub256	Sub	–	Specifies an electronic mailbox directory attribute following the syntax specified in RFC 2822.
url	ub1024	Sub		Specifies a URL following the syntax specified in RFC 1738.
commService (See item 1 below)	ComServices	As	–	It specifies the type of service(s) associated with a communications address. It describes the class of service that the Communications Address provides access to, for example, telephone (voice), facsimile, electronic mail, SMS (short messaging service), EDI, file transfer, etc.
commNetwork	ComNetwork	As	–	It specifies the type of network for which a communications address is used. It describes the type of network where the Communications Address is allocated. For example, a Public Switch Telephone Network (PSTN), an ISDN network, or a GSM mobile phone network. It could also be an application oriented network, e.g., a banking network.

Table 3/F.515 – Communication address directory attributes

Directory attribute type	Syntax (XML type)	Match type	Language attribute	Use
addrValidFrom	dateTime	–	–	See item 2 below.
addrValidUntil	dateTime	–	–	See item 2 below.
addrValidity	AddrValidity Type	As	–	See item 2 below.
addrCoverage	AddrCoverage Type	As	–	The address coverage directory attribute type specifies area of validity of a communications address.
addrTariff	AddrTariff Type	As	–	The Address Tariff directory attribute type specifies what tariff is associated with a communications address.
addrRestriction	addrRestriction Type	As	–	The Address Restriction directory attribute type provides information about the restriction of access to the Communications Address information.

- 1) The XML syntax is a list of enumerated. It is therefore possible to add several values to a single XML attribute element.
- 2) If neither of the directory attribute types is present, the communications address is *valid* and *current*.

If the **addrValidFrom** directory attribute is present, but the **addrValidUntil** directory attribute is absent, and if the current date is equal or greater than the date given in the **addrValidFrom** directory attribute, then the communications address is *current*; otherwise it is *future*.

If the **addrValidUntil** attribute is present, but the **addrValidFrom** directory attribute is absent, and if the current date is less or equal than the date given in the **addrValidUntil** directory attribute, then the communications address is *current*; otherwise it is *old*.

If both the **addrValidFrom** directory attribute and the **addrValidUntil** directory attribute are present, and if the current date is greater or equal to the date given the **addrValidFrom** directory attribute and is less or equal to the date given in the **addrValidUntil** directory attribute, then the communications address is *temporary*. If the current date is less than the date given in the **addrValidFrom** directory attribute, then the communications address is *new*. If the current date is greater than the date given in the **addrValidFrom** directory attribute, then the communications address is *old*.

NOTE 1 – This assumes that the **addrValidFrom** value is less or equal to **addrValidUntil** value. If that is not the case, the specifications are invalid and useless.

The **addrValidity** is used primarily in the case where a database does not support inclusion of validity dates of communications addresses. If **addrValidFrom** and **addrValidUntil** directory attribute types are supported, the **addrValidity** directory attribute, if present, should be derived from those two other directory attribute types.

NOTE 2 – Even when validity dates are supported by the database, the **addrValidity** could be derived to support matching against this directory attribute type.

7.5.2.1 The Communications Service Type directory attribute

The **ComServiceTypes** simple XML type is a list item type derived from the enumerated **ComServiceType** XML simple type. The **ComServiceType** defines the following enumerated values:

- **voice**;
- **fax**:
 - **textPhone**;
 - **videoPhone**;
 - **publicPhoneBox**;
 - **switchBoard**;
 - **pager**;
- **data**;
- **email**;
- **web**.

7.5.2.2 Network Types simple XML type

The **NetworkType** type is an enumerated XML simple type. The following enumerated values are defined:

- **pstn**;
- **isdn**;
- **gsm**;
- **umts**;
- **internet**.

7.5.2.3 Address Validity Types simple XML type

The **AddrValidityType** is an enumerated XML simple type. The following enumerated values are defined:

- **current** indicates that the communications address is currently valid;
- **old** indicates that the communication address has been taken out of service;
- **future** indicates that the communication address has not been put into service; and
- **temporary** indicates that the communications address is currently valid, but its lifetime is limited.

7.5.2.4 Coverage Type simple XML type

The **addrCoverageType** is an enumerated XML simple type. The following enumerated values are defined:

- **international** indicates that the communications address has unlimited coverage.
- **national** indicates that the communications address is valid within the country of the subscriber.
- **stateOrProvince** indicates that the communications address is valid at least within the area indicated by the **stateOrProvince** directory attribute of the subscriber entry.
- **locality** indicates that the communications address is valid at least within the area indicated by the **localityName** directory attribute of the subscriber entry.

7.5.2.5 Tariff simple XML type

The **AddrTariffType** is an enumerated XML simple type. The following enumerated values are defined:

- **normal** indicates that standard tariff applies for the calling the number.
- **premium** indicates that some special tariff is used when calling the number.
- **toll-free** indicates that in general the called part pays for a call.

NOTE – New values may be introduced later. Implementations should be prepared for extensions.

7.5.2.6 Address Restriction simple XML type

The **AddrRestrictionType** is an enumerated XML simple type. The following enumerated values are defined:

- **public** indicates that the communications address can be revealed without restrictions;
- **secret** indicates that the communications address shall not be revealed;
- **call-screen**;
- **no-marketing**;
- **complete-only**.

The **call-screen** value indicates that an operator can call the subscriber to ask if it wants to receive the call, and then allow call completion. The communications address is not revealed.

The **no-marketing** value indicates that the communications address can be revealed, but it shall not be used for unsolicited marketing.

The **complete-only** value indicates that the communications address shall not be revealed, but the operator may put a call through for the inquirer.

NOTE – New values may be introduced later. Implementations should be prepared for extensions.

8 Service specification

No specification beyond ITU-T Rec. F.510 is needed.

9 Common Protocol Specification element

9.1 Character set, encoding and repertoire

The ISO/IEC 10646-1 character set with the UTF-8 encoding shall be used for encoding the UDAP.

The ISO/IEC 10646-1 character repertoire is constrained to the following subset of plane 00:

- Row 00, positions 20-7E (BASIC LATIN);
- Row 00, positions A0-FF (LATIN-1 SUPPLEMENT);
- Row 01, positions 00-13, 16-2B, 2E-4D, 50-7E (part of LATIN EXTENDED-A).

It is expected that the repertoire will be extended as directory services based on this Recommendation spread outside Europe.

To the extent that this repertoire cannot be supported by an implementation, it has to be clearly stated.

NOTE – Service providers may make mutual agreements that further limits the character repertoire.