

## Section Four - Naming, Addressing, and Routing

### 16. Overview

This section describes the naming and addressing of users and DLs and the routing of information objects to them.

This section covers the following topics:

- a) Naming
- b) Addressing
- c) Routing

### 17. Naming

This clause specifies how users and DLs are named for the purposes of Message Handling in general and Message Transfer in particular. It defines O/R names and describes the role that Directory names play in them.

When it directly submits a message or probe, a UA or MS identifies its potential recipients to the MTS. When the MTS delivers a message, it identifies the originator to each recipient's UA or MS. O/R names are the data structures by means of which such identification is achieved.

#### 17.1 Directory Names

A Directory name is one component of an O/R name. A Directory name identifies an object to the Directory. By presenting such a name to the Directory, the MHS can access a user's or DL's Directory entry. From that entry the MTS can obtain, e.g., the user's or DL's O/R address.

Not every user or DL is registered in the Directory and, therefore, not every user or DL possesses a Directory name.

Notes

1. Many users and DLs will lack Directory names until the Directory is widely available as an adjunct to the MHS. Many indirect users (e.g., postal patrons) will lack such names until the Directory is widely available as an adjunct to other communication systems.
2. Users and DLs may be assigned Directory names even before a fully interconnected, distributed Directory has been put in place by pre-establishing the naming authorities upon which the Directory will eventually depend.
3. The typical Directory name is more user-friendly and more stable than the typical O/R address because the latter is necessarily couched in terms of the organizational or physical structure of the MHS while the former need not be. Therefore, it is intended that over time, Directory names become the primary means by which users and DLs are identified outside the MTS (i.e., by other users), and that the use of O/R addresses be largely confined to the MTS (i.e., to use by MTAs).

#### 17.2 O/R Names

Every user or DL has one or more O/R names. An .I.gl:O/R name; is an identifier by means of which a user can be designated as the originator, or a user or DL designated as a potential recipient of a message or probe. An O/R name distinguishes one user or DL from another and may also identify its point of access to the MHS.

An O/R name comprises a Directory name, an O/R address, or both. If present, the directory name (if valid) unambiguously identifies the user or DL (but is not necessarily the only name that would do so). If present, the O/R address does the same and more (again see clause 18.5).

At direct submission, the UA or MS of the originator of a message or probe may include either or both components in each O/R name it supplies. If the O/R address is omitted, the MTS obtains it from the Directory using the Directory name. If the Directory name is omitted, the MTS does without it. If both are included, the MTS relies firstly upon the O/R address. Should it determine that the O/R address is invalid (e.g., obsolete), it proceeds as if the O/R address had been omitted, relying upon the Directory name.

At delivery the MTS includes an O/R address and possibly a Directory name in each O/R name it supplies to a message's recipient or to the originator of a report's subject message or probe. The Directory name is included if the originator supplied it or if it was specified as the the member of an expanded DL.

Note Redirection or DL expansion may cause the MTS to convey to a UA or MS at delivery, O/R names the UA or MS did not supply at direct submission.

### 18. Addressing

This clause specifies how users and DLs are addressed. It defines O/R addresses, describes the structure of the attribute lists from which they are constructed, discusses the character sets from which individual attributes are composed, gives

rules for determining that two attribute lists are equivalent and for the inclusion of conditional attributes in such lists, and defines the standard attributes that may appear in them.

To convey a message, probe, or report to a user, or to expand a DL specified as a potential recipient of a message or probe, the MTS must locate the user or DL relative to its own physical and organizational structures. O/R addresses are the data structures by means of which all such location is accomplished.

### 18.1 Attribute Lists

The O/R addresses of both users and DLs are attribute lists. An .I.gl:attribute list; is an ordered set of attributes.

An .I.gl:attribute; is an information item that describes a user or DL and that may also locate it in relation to the physical or organizational structure of the MHS (or the network underlying it).

An attribute has the following parts:

- a) .I.gl:attribute type; (or .I.gl:type;): An identifier that denotes a class of information (e.g., personal names).
- b) .I.gl:attribute value; (or .I.gl:value;): An instance of the class of information the attribute type denotes (e.g., a particular personal name).

Attributes are of the following two kinds:

- a) .I.gl:standard attribute;: An attribute whose type is bound to a class of information by this Recommendation. The value of every standard attribute except terminal-type is either a string or a collection of strings.
- b) .I.gl:domain-defined attribute;: An attribute whose type is bound to a class of information by an MD. Both the type and value of every domain-defined attribute are strings or collections of strings.

Note The widespread use of standard attributes produces more uniform and thus more user-friendly O/R addresses.

However, it is anticipated that not all MDs will be able to employ such attributes immediately. The purpose of domain-defined attributes is to permit an MD to retain its existing, native addressing conventions for a time. It is intended, however, that all MDs migrate toward the use of standard attributes, and that domain-defined attributes be used only for an interim period.

### 18.2 Character Sets

Standard attribute values and domain-defined attribute types and values are constructed from Numeric, Printable, and Teletex Strings as follows:

- a) The type or value of a particular domain-defined attribute may be a Printable String, a Teletex String, or both. The same choice shall be made for both the type and value.
- b) The kinds of strings from which standard attribute values may be constructed and the manner of construction (e.g., as one string or several) vary from one attribute to another (see clause 18.3).

The value of an attribute comprises strings of one of the following sets of varieties depending upon its type: Numeric only, Printable only, Numeric and Printable, and Printable and Teletex. With respect to this, the following rules govern each instance of communication:

- a) Wherever both Numeric and Printable Strings are permitted, strings of either variety (but not both) may be supplied equivalently.
- b) Wherever both Printable and Teletex Strings are permitted, strings of either or both varieties may be supplied, but Printable Strings shall be supplied as a minimum whenever attributes are conveyed internationally. If both Printable and Teletex Strings are supplied, the two should convey the same information so that either of them can be safely ignored upon receipt.

The length of each string and of each sequence of strings in an attribute shall be limited as indicated in the more detailed (i.e., ASN.1) specification of attributes in Recommendation X.411.

#### Notes

1. Teletex Strings are permitted in attribute values to allow inclusion, e.g., of the accented characters commonly used in many countries.

2. Not all input/output devices permit the entry and display, e.g., of accented characters. Printable Strings are required internationally to ensure that such device limitations do not prevent communication.

### 18.3 Standard Attributes

The standard attribute types are listed in the first column of Table 9/X.402. For each listed type, the second column indicates the character sets--numeric, printable, and teletex--from which attribute values may be drawn.

The table has three sections. Attribute types in the first are of a general nature, those in the second have to do with routing

to a PDS, and those in the third have to do with addressing within a PDS.

Table .T.:9/X.402 Standard Attributes

Standard Attribute Type			Character Sets		
Standard Attribute Type	NUM	PRT	TTX	General	
administration-domain-name	x	x	-	common-name	- x x
country-name	x	x	-	network-address	x(*) - -    numeric-user-
identifier	x	-	-	organization-name	- x x    organizational-unit-names
- x x    personal-name	-	x	x	private-domain-name	x x -
terminal-identifier	-	x	-	terminal-type	- - -  +- Postal Routing
PDS-name			-	x	-    physical-delivery-country-
name	x	x	-	postal-code	x x -  +- Postal Addressing
extension-O/R-address-components	-	x	x	extension-physical-delivery-address-	
components	-	x	x	local-postal-attributes	- x x    physical-delivery-office-name
x x    physical-delivery-office-number	-	x	x	physical-delivery-organization-name	- x x
physical-delivery-personal-name	-	x	x	post-office-box-address	- x x    poste-
restante-address	-	x	x	street-address	- x x    unformatted-postal-address
- x x    unique-postal-name	-	x	x		
Legend			NUM numeric	x permitted	PRT printable * Under prescribed
circum-	TTX teletex	stances a Printable String			

The standard attribute types, summarized in the table, are individually defined and described in the clauses below.

### 18.3.1 Administration-domain-name

An .I.gl:administration-domain-name; is a standard attribute that identifies an ADMD relative to the country denoted by a country-name.

The value of an administration-domain-name is a Numeric or Printable String chosen from a set of such strings that is administered for this purpose by the country alluded to above.

Note The attribute value comprising a single space (" ") shall be reserved for the following purpose. If permitted by the country denoted by the country-name attribute, a single space shall designate any (i.e., all) ADMDs within the country.

This affects both the identification of users within the country and the routing of messages, probes, and reports to and among the ADMDs of that country. Regarding the former, it requires that the O/R addresses of users within the country be chosen so as to ensure their unambiguousness, even in the absence of the actual names of the users' ADMDs. Regarding the latter, it permits both PRMDs within, and ADMDs outside of the country, to route messages, probes, and reports to any of the ADMDs within the country indiscriminantly, and requires that the ADMDs within the country interconnect themselves in such a way that the messages, probes, and reports are conveyed to their destinations.

Temporary note The inclusion of the above note is tentative, subject to the approval of Administrations. The note would resolve a long-standing difference between CCITT and ISO in this area. If CCITT rejects the note and ISO elects to include it in its corresponding International Standard, as is likely, a major difference between the CCITT Recommendation and ISO Standard will result.

### 18.3.2 Common-name

A .I.gl:common-name; is a standard attribute that identifies a user or DL relative to the entity denoted by another attribute (e.g., an organization-name).

The value of a common-name is a Printable String, Teletex String, or both. Whether Printable or Teletex, the string is chosen from a set of such strings that is administered for this purpose (and perhaps others) by the entity alluded to above.

Note Among many other possibilities, a common-name might identify an organizational role (e.g., "Director of Marketing").

### 18.3.3 Country-name

A .I.gl:country-name; is a standard attribute that identifies a country.

The value of a country-name is a Numeric String that gives the number assigned to the country by Recommendation X.121, or a Printable String that gives the character pair assigned to the country by ISO 3166.

### 18.3.4 Extension-O/R-address-components

An extension-postal-O/R-address-components; is a standard attribute that provides, in a postal address, additional information necessary to identify the addressee (e.g., an organizational unit).

The value of an extension-O/R-address-components is a Printable String, Teletex String, or both.

#### 18.3.5 Extension-physical-delivery-address-components

An .I.gl:extension-physical-delivery-address-components; is a standard attribute that specifies, in a postal address, additional information necessary to identify the exact point of delivery (e.g., room and floor numbers in a large building).

The value of an extension-physical-delivery-address-components is a Printable String, Teletex String, or both.

#### 18.3.6 Local-postal-attributes

A .I.gl:local-postal-attributes; is a standard attribute that identifies the locus of distribution, other than that denoted by a physical-delivery-office-name attribute (e.g., a geographical area), of a user's physical messages.

The value of a local-postal-attributes is a Printable String, Teletex String, or both.

#### 18.3.7 Network-address

A .I.gl:network-address; is a standard attribute that gives the network address of a terminal.

The value of a network-address is any one of the following:

- a) A Numeric String governed by Recommendation X.121.
- b) Two Numeric Strings governed by Recommendations E.163 and E.164.
- c) A PSAP address.

Note - Among the strings admitted by Recommendation X.121 is a Telex number preceded by the Telex escape digit (8).

#### 18.3.8 Numeric-user-identifier

A .I.gl:numeric-user-identifier; is a standard attribute that numerically identifies a user relative to the ADMD denoted by an administration-domain-name.

The value of a numeric-user-identifier is a Numeric String chosen from a set of such strings that is administered for this purpose by the ADMD alluded to above.

Note - In countries choosing country-wide unique organization-names, a national registration authority for organization-names is required.

#### 18.3.9 Organization-name

An organization-name is a standard attribute that identifies an organization. As a national matter, this identification may be either relative to the country denoted by a country-name (so that organization names are unique within the country), or relative to the MD identified by a private-domain-name, or an administration-domain-name, or both.

The value of an organization-name is a Printable String, Teletex String, or both. Whether Printable or Teletex, the string is chosen from a set of such strings that is administered for this purpose (and perhaps others) by the country alluded to above.

Note - In countries choosing country-wide unique organization-names, a national registration authority for organization-names is required.

#### 18.3.10 Organizational-unit-names

An .I.gl:organizational-unit-names; is a standard attribute that identifies one or more units (e.g., divisions or departments) of the organization denoted by an organization-name, each unit but the first being a sub-unit of the units whose names precede it in the attribute.

The value of an organizational-unit-names is an ordered sequence of Printable Strings, an ordered sequence of Teletex Strings, or both. Whether Printable or Teletex, each string is chosen from a set of such strings that is administered for this purpose (and perhaps others) by the organization (or encompassing unit) alluded to above.

#### 18.3.11 Physical-delivery service-name

A Physical-delivery-name is a standard attribute that identifies a PDS relative to the ADMD denoted by an administration-domain-name.

The value of a PDS-name is a Printable String chosen from a set of such strings that is administered for this purpose by the ADMD alluded to above.

### 18.3.12 Personal-name

A .I.gl:personal-name; is a standard attribute that identifies a person relative to the entity denoted by another attribute (e.g., an organization-name).

The value of a personal-name comprises the following four pieces of information, the first mandatory, the others optional:

- a) The person's surname.
- b) The person's given name.
- c) The initials of all of his names but his surname.
- d) His generation (e.g., "Jr.").

The above information is supplied as Printable Strings, Teletex Strings, or both.

### 18.3.13 Physical-delivery-country-name

A .I.gl:physical-delivery-country-name; is a standard attribute that identifies the country in which a user takes delivery of physical messages.

The value of a physical-delivery-country-name is subject to the same constraints as is the value of a country-name.

### 18.3.14 Physical-delivery-office-name

A .I.gl:physical-delivery-office-name; is a standard attribute that identifies the city, village, etc. in which is situated the post office through which a user takes delivery of physical messages.

The value of a physical-delivery-office-name is a Printable String, Teletex String, or both.

### 18.3.15 Physical-delivery-office-number

A .I.gl:physical-delivery-office-number; is a standard attribute that distinguishes among several post offices denoted by a single physical-delivery-office-name.

The value of a physical-delivery-office-number is a Printable String, Teletex String, or both.

### 18.3.16 Physical-delivery-organization-name

A .I.gl:physical-delivery-organization-name; is a standard attribute that identifies a postal patron's organization.

The value of a physical-delivery-organization-name is a Printable String, Teletex String, or both.

### 18.3.17 Physical-delivery-personal-name

A .I.gl:physical-delivery-personal-name; is a standard attribute that identifies a postal patron.

The value of a physical-delivery-personal-name is a Printable String, Teletex String, or both.

### 18.3.18 Post-office-box-address

A .I.gl:post-office-box-address; is a standard attribute that specifies the number of the post office box by means of which a user takes delivery of physical messages.

The value of a post-office-box-address is a Printable String, Teletex String, or both chosen from the set of such strings assigned for this purpose by the post office denoted by a physical-delivery-office-name attribute.

### 18.3.19 Postal-code

A .I.gl:postal-code; is a standard attribute that specifies the postal code for the geographical area in which a user takes delivery of physical messages.

The value of a postal-code is a Numeric or Printable String chosen from the set of such strings that is maintained and standardized for this purpose by the postal administration of the country identified by a physical-delivery-country-name attribute.

### 18.3.20 Poste-restante-address

A .I.gl:poste-restante-address; is a standard attribute that specifies the code that a user gives to a post office in order to collect the physical messages that await delivery to him.

The value of a poste-restante-address is a Printable String, Teletex String, or both chosen from the set of such strings assigned for this purpose by the post office denoted by a physical-delivery-office-name attribute.

### 18.3.21 Private-domain-name

A private-domain-name is a standard attribute that identifies a PRMD. As a national matter, this identification may be either relative to the country denoted by a country-name (so that PRMD names are unique within the country), or relative to the ADMD identified by an administration-domain-name.

The value of a private-domain-name is a Numeric or Printable String chosen from a set of such strings that is

administered for this purpose by the ADMD alluded to above.

Note - In countries choosing country-wide unique PRMD names, a national registration authority for private-domain-names is required.

#### 18.3.22 Street-address

A .I.gl:street-address; is a standard attribute that specifies the street address (e.g., house number and street name and type (e.g., "Road")) at which a user takes delivery of physical messages.

The value of a street-address is a Printable or Teletex String.

#### 18.3.23 Terminal-identifier

A .I.gl:terminal-identifier; is a standard attribute that gives the terminal identifier of a terminal (e.g., a Telex answer back or a Teletex terminal identifier).

The value of a terminal-identifier is a Printable String.

#### 18.3.24 Terminal-type

A .I.gl:terminal-type; is a standard attribute that gives the type of a terminal.

The value of a terminal-type is any one of the following: Telex, Teletex, G3 facsimile, G4 facsimile, IA5 terminal, and Videotex.

#### 18.3.25 Unformatted-postal-address

An .I.gl:unformatted-postal-address; is a standard attribute that specifies a user's postal address in free form.

The value of an unformatted-postal-address is a sequence of Printable Strings, each representing a line of text; a single Teletex String, lines being separated as prescribed for such strings; or both.

#### 18.3.26 Unique-postal-name

A .I.gl:unique-postal-name; is a standard attribute that identifies the point of delivery, other than that denoted by a street-address, post-office-box-address, or poste-restante-address, (e.g., a building or hamlet) of a user's physical messages.

The value of a unique-postal-name is a Printable String, Teletex String, or both.

### 18.4 Attribute List Equivalence

Several O/R addresses, and thus several attribute lists, may denote the same user or DL. This multiplicity of O/R addresses results in part (but not in full) from the following attribute list equivalence rules:

- a) The relative order of standard attributes is insignificant.
- b) Where the value of a standard attribute may be a Numeric String or an equivalent Printable String, the choice between them shall be considered insignificant.
- c) Where the value of a standard attribute may be a Printable String, an equivalent Teletex String, or both, the choice between the three possibilities shall be considered insignificant.
- d) Where the value of a standard attribute may contain letters, the cases of those letter shall be considered insignificant.
- e) In a domain-defined attribute type or value, or in a standard attribute value, all leading, all trailing, and all but one consecutive embedded spaces shall be considered insignificant.

#### Notes

1. An MD may impose additional equivalence rules upon the attributes it assigns to its own users and DLs. It might define, e.g., rules concerning punctuation characters in attribute values, the case of letters in such values, or the relative order of domain-defined attributes.

2. As a national matter, MDs may impose additional equivalence rules regarding standard attributes whose values are given as Teletex Strings, in particular, the rules for deriving the equivalent Printable Strings.

### 18.5 O/R Address Forms

Every user or DL is assigned one or more O/R addresses. An .I.gl:O/R address; is an attribute list that distinguishes one user from another and identifies the user's point of access to the MHS or the DL's expansion point.

An O/R address may take any of the forms summarized in Table 10/X.402. The first column of the table identifies the attributes available for the construction of O/R addresses. For each O/R address form, the second column indicates the attributes that may appear in such O/R addresses and their grades (see also clause 18.6).

The table has four sections. Attribute types in the first are those of a general nature, attribute types in the second and third those specific to physical delivery. The fourth section encompasses domain-defined attributes.

Table .T.:10/X.402 Forms of O/R Address

O/R Address Forms									
TERM	General	POST	Attribute Type	MNEM	NUMR	F	U		
C	common-name	C - C - -	country-name	M	M	M	M	C	network-
address	- - - - M	numeric-user-identifier	- M - - -	organization-name					
C - C - -	organizational-unit-names	C - - - -	personal-name	C - C - -					
private-domain-name	C C C C C	terminal-identifier	- - - - C	terminal-type					
- - - - C	Postal Routing	PDS-name		- - O					
O -	physical-delivery-country-name	- - M M -	postal-code	- - M M -					
Postal Addressing	extension-O/R-address-components	- - C - -							
extension-physical-delivery	- - C - -	-address-components							
attributes	- - C - -	physical-delivery-office-name	- - C - -	physical-delivery-office-					
number	- - C - -	physical-delivery-organization-name	- - C - -	physical-delivery-personal-name					
- - C - -	post-office-box-address	- - C - -	poste-restante-address	- - C - -					
street-address	- - C - -	unformatted-postal-address	- - - M -	unique-postal-name					
- - C - -	Domain-defined	domain-defined (one or more)		C					
C - - C									
Legend									
MNEM	mnemonic	F	formatted	M	mandatory	NUMR	numeric	U	unformatted
O	optional	POST	postal						
C	conditional	TERM	terminal						

The forms of O/R address, summarized in the table, are individually defined and described in the clauses below.

#### 18.5.1 Mnemonic O/R Address

A .I.gl:mnemonic O/R address; is one that mnemonically identifies a user or DL. It identifies an ADMD, and a user or DL relative to it.

A mnemonic O/R address comprises the following attributes:

- One country-name and one administration-domain-name, which together identify an ADMD.
- One private-domain-name, one organization-name, one organizational-unit-names, one personal-name or common-name, or a combination of the above; and optionally one or more domain-defined attributes; which together identify a user or DL relative to the ADMD in item a above.

#### 18.5.2 Numeric O/R Address

A .I.gl:numeric O/R address; is one that numerically identifies a user. It identifies an ADMD, and a user relative to it.

A numeric O/R address comprises the following attributes:

- One country-name and one administration-domain-name, which together identify an ADMD.
- One numeric-user-identifier and, conditionally, one private-domain-name, which together identify the user relative to the ADMD in item a above.
- Conditionally, one or more domain-defined attributes which provide information additional to that which identifies the user.

#### 18.5.3 Postal O/R Address

A .I.gl:postal O/R address; is one that identifies a user by means of its postal address. It identifies the PDS through which the user is to be accessed and gives the user's postal address.

The following kinds of postal O/R address are distinguished:

- .I.gl:formatted;: Said of a postal O/R address that specifies a user's postal address by means of several attributes. For this form of postal O/R address, this Recommendation prescribes the structure of postal addresses in some detail.
- .I.gl:unformatted;: Said of a postal O/R address that specifies a user's postal address in a single attribute. For this form of postal O/R address, this Recommendation largely does not prescribe the structure of postal addresses.

A postal O/R address, whether formatted or unformatted, comprises the following attributes:

- One country-name and one administration-domain-name, which together identify an ADMD.
- Conditionally, one private-domain-name, one physical-delivery-service- name, or both which together identify the PDS by means of which the user is to be accessed.
- One physical-delivery-country-name and one postal-code, which together identify the geographical region in

which the user takes delivery of physical messages.

A formatted postal O/R address comprises, additionally, one of each postal addressing attribute (see Table 9/X.402), except unformatted-postal-address, that the PDS requires to identify the postal patron.

An unformatted postal O/R address comprises, additionally, one unformatted-postal-address attribute.

Note - The total number of characters in the values of all attributes but country-name, administration-domain-name, and physical-delivery-service-name in a postal O/R address should be small enough to permit their rendition in 6 lines of 30 characters, the size of a typical physical envelope window. The rendition algorithm is PDAU-specific but is likely to include inserting delimiters (e.g., spaces) between some attribute values.

#### 18.5.4 Terminal O/R Address

A .I.gl:terminal O/R address; is one that identifies a user by means of the network address and, if required, the type of his terminal. It may also identify the ADMD through which that terminal is accessed. In the case of a Telematic terminal, it gives the terminal's network address and possibly its terminal identifier and terminal type. In the case of a Telex terminal, it gives its Telex number.

A terminal O/R address comprises the following attributes:

- a) One network-address.
- b) Conditionally, one terminal-identifier.
- c) Conditionally, one terminal-type.
- d) Conditionally, both one country-name and one administration-domain-name which together identify an ADMD.
- e) Conditionally, one private-domain-name and, conditionally, one or more domain-defined attributes, all of which provide information additional to that which identifies the user.

The private-domain-name and the domain-defined attributes shall be present only if the country-name and administration-domain-name attributes are present.

#### 18.6 Conditional Attributes

The presence or absence in a particular O/R address of the attributes marked conditional in Table 10/X.402 is determined as follows.

If a user or DL is accessed through a PRMD, attributes used to route messages to the PRMD are present in the O/R address at the discretion of, and in accordance with rules established by the ADMD denoted by the country-name and administration-domain-name attributes of the O/R address. The ADMD imposes no other constraints on the attributes in the O/R address. If a user is not accessed through a PRMD, all conditional attributes except those specific to postal O/R addresses are present in an O/R address at the discretion of, and in accordance with rules established by, the ADMD denoted by the country-name and administration-domain-name attributes.

All conditional attributes specific to postal O/R addresses are present or absent in such O/R addresses so as to satisfy the postal addressing requirements of the users they identify.

### 19. Routing

to convey a message, probe, or report toward a user or the expansion point of a DL, an MTA must not only locate the user or DL (i.e., obtain its O/R address) but also select a route to that location.

External routing is an incremental and only loosely standardized process. Suggested below are several principles of external routing. Internal routing is outside the scope of this Recommendation.

The following principles are illustrative, not definitive:

- a) In an MHS that comprises a single MD, of course, routing is not an issue.
- b) A PRMD may be connected to a single, ADMD. When this is so, routing always involves the ADMD necessarily.
- c) An ADMD may be connected to multiple PRMDs. When this is so, routing may be based upon conditional O/R address attributes, including but not limited to private-domain-name.



- d) An MD may be directly connected to some but not all other MDs. When the O/R address identifies a MD to which no direct connection exists, routing may be based upon .I.ba:routing;bilateral agreements with the MDs to which direct connections do exist and other local rules.
  - e) When the MD is directly connected to the MD identified by the O/R address, the object is typically routed to that MD directly.
  - f) By .I.ba:routing;bilateral agreement, one MD might route an object to another MD for the purpose, e.g., of conversion.
  - g) An MD may route to a malformed O/R address provided (of course) that it contains at least the attributes required to do so.
- Note The bilateral agreements and local rules alluded to above are beyond the scope of this Recommendation and may be based upon technical, policy, economic, or other considerations.