Network Working Group
INTERNET-DRAFT

S.E. Hardcastle-Kille
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# Representing the O/R Address hierarchy in the Directory Information Tree

## Status of this Memo



## Abstract

This document defines a representation of the O/R Address hierarchy in the Directory Information Tree [7, 1]. This is useful for a range of purposes, including:

- Support for MHS Routing [3].
- Support for X.400/RFC 822 address mappings [6, 4].

This draft document will be submitted to the RFC editor as a protocol standard. Distribution of this memo is unlimited. Please send comments to the author or to the discussion group `<mhs-ds@mercury.udev.cdc.com>`.

# 1 The O/R Address Hierarchy

An O/R Address hierarchy is mapped onto the directory by associating directory name components with O/R Address components. An example of this is given in Figure 1, the schema definition is given in Figure 2, and the required object classes and attributes defined in Figure 3.

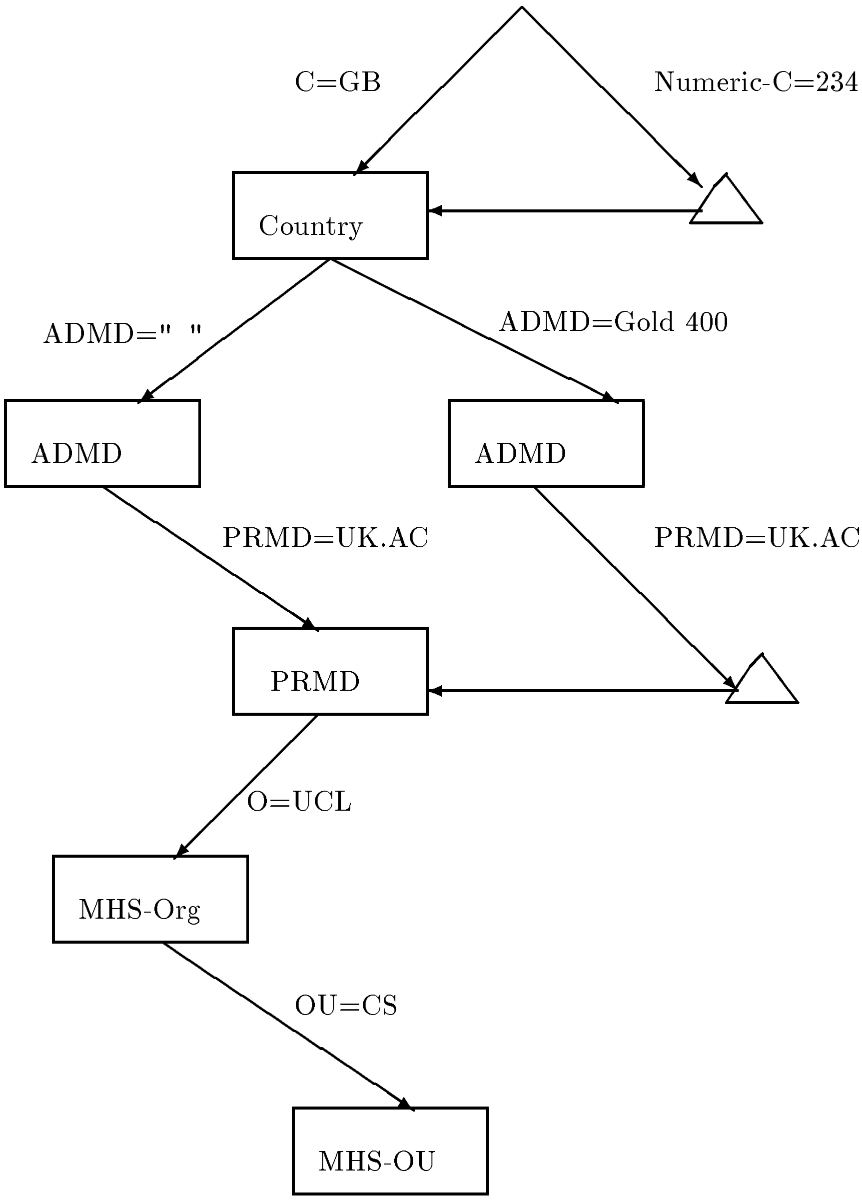


Figure 1: Example O/R Address Tree

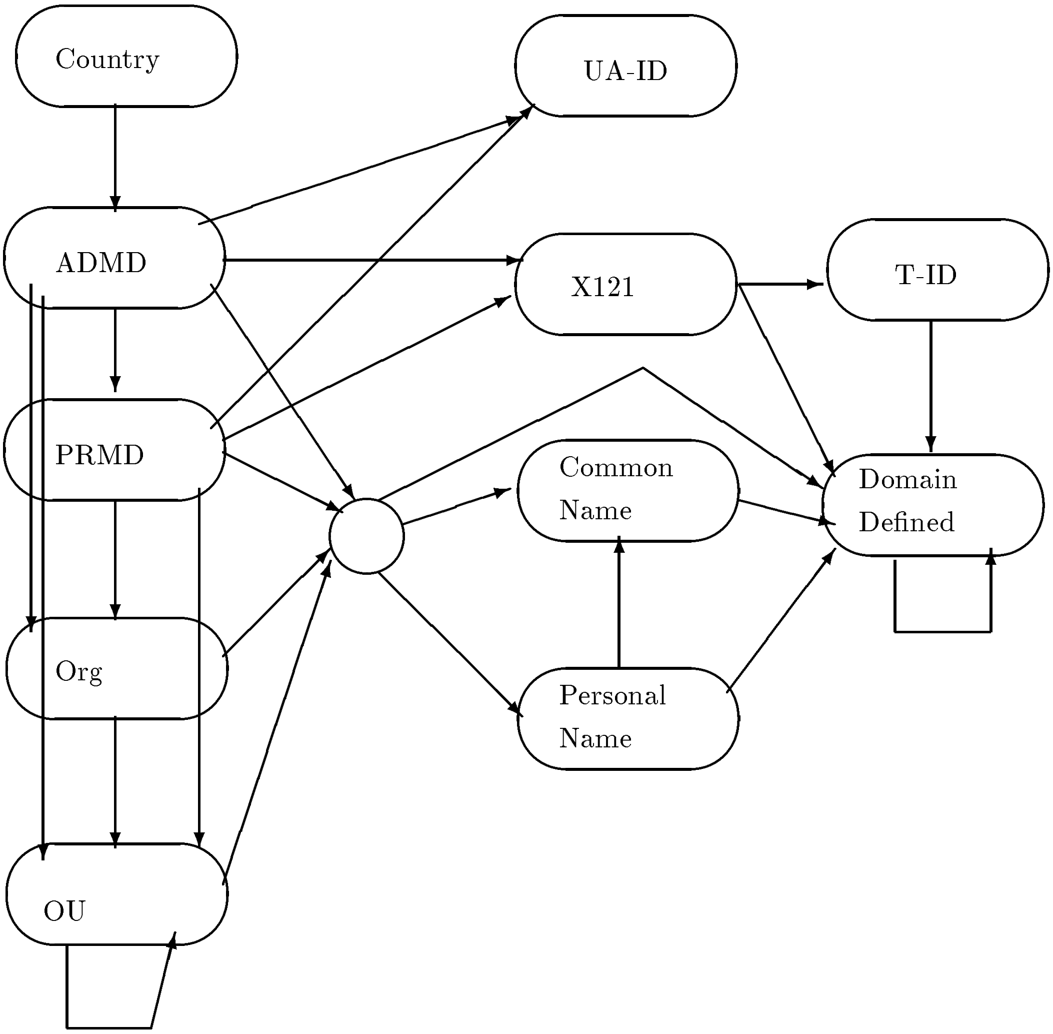


Figure 2: O/R Address Tree Schema

```
IMPORTS
 ub-domain-name-length, ub-domain-name-length, ub-organization-name-length,
 ub-organizational-unit-name-length, ub-common-name-length,
 ub-x121-address-length, ub-domain-defined-attribute-type-length,
 ub-domain-defined-attribute-value-length, ub-terminal-id-length,
 ub-numeric-user-id-length

   FROM MTSUpperBounds {joint-iso-ccitt mhs-motis(6) mts(3)
      modules(0) upper-bounds(3) };

mHSCountry OBJECT-CLASS
   SUBCLASS OF country
   MAY CONTAIN {
          countryName,                    -- one of these must be present
          mHSNumericCountryName }
   ::= oc-mhs-country

mHSNumericCountryName ATTRIBUTE
   WITH ATTRIBUTE-SYNTAX
          NumericString (3..3)
   SINGLE VALUE
   ::= at-mhs-numeric-country-name

aDMD OBJECT-CLASS
   SUBCLASS OF organization
   MUST CONTAIN {aDMDName }
   ::= oc-admd

aDMDName ATTRIBUTE
   WITH ATTRIBUTE-SYNTAX
          caseIgnoreStringSyntax (SIZE (1..ub-domain-name-length))
   ::= at-admd-name

pRMD OBJECT-CLASS
   SUBCLASS OF top
   MUST CONTAIN {pRMDName }
   ::= oc-prmd

pRMDName ATTRIBUTE
   WITH ATTRIBUTE-SYNTAX
          caseIgnoreStringSyntax (SIZE (1..ub-domain-name-length))
   ::= at-prmd-name

mHSOrganisation OBJECT-CLASS
   SUBCLASS OF top
   MUST CONTAIN {mHSOrganisationName }
   ::= oc-mhs-organisation

mHSOrganisationName ATTRIBUTE
   SUBTYPE OF organisationName
   WITH ATTRIBUTE-SYNTAX
          caseIgnoreStringSyntax (SIZE (1..ub-organization-name-length))
   ::= at-mhs-organisation-name


mHSOrganisationalUnit OBJECT-CLASS
```

```
   SUBCLASS OF top
   MUST CONTAIN {mHSOrganisationalUnitName }
   ::= oc-mhs-organisational-unit

mHSOrganisationalUnitName ATTRIBUTE
   SUBTYPE OF organizationalUnitName
   WITH ATTRIBUTE-SYNTAX
           caseIgnoreStringSyntax (SIZE (1..ub-organizational-unit-name-length))
   ::= at-mhs-organisation-name

mHSPerson OBJECT-CLASS
   SUBCLASS OF top
   MUST CONTAIN {personName}
   ::= oc-mhs-person

personName ATTRIBUTE
   SUBTYPE OF commonName
   ::= at-mhs-person-name

mHSNamedObject OBJECT-CLASS
   SUBCLASS OF top
   MUST CONTAIN {mHSCommonName}
   ::= oc-mhs-named-object

mHSCommonName ATTRIBUTE
   SUBTYPE OF commonName
   WITH ATTRIBUTE-SYNTAX
           caseIgnoreStringSyntax (SIZE (1..ub-common-name-length))
   ::= at-mhs-common-name

mHSX121 OBJECT-CLASS
   SUBCLASS OF top
   MUST CONTAIN {mHSX121Address}
   ::= oc-mhs-x121

mHSX121Address ATTRIBUTE
   WITH ATTRIBUTE-SYNTAX
           caseIgnoreStringSyntax (SIZE (1..ub-x121-address-length))
   ::= at-x121-address

mHSDomainDefinedAttribute OBJECT-CLASS
   SUBCLASS OF top
   MUST CONTAIN {
           mHSDomainDefineAttributeType,
           mHSDomainDefineAttributeValue}
   ::= oc-mhs-domain-defined-attribute

mHSDomainDefinedAttributeType ATTRIBUTE
   WITH ATTRIBUTE-SYNTAX
           caseIgnoreStringSyntax
 (SIZE (1..ub-domain-defined-attribute-type-length))
   SINGLE VALUE
   ::= at-mhs-domain-defined-attribute-type

mHSDomainDefinedAttributeValue ATTRIBUTE
   WITH ATTRIBUTE-SYNTAX
           caseIgnoreStringSyntax
```

```
 (SIZE (1..ub−domain−defined−attribute−value−length))
    SINGLE VALUE
    ::= at−mhs−domain−defined−attribute−value


mHSTerminalID OBJECT−CLASS
    SUBCLASS OF top
    MUST CONTAIN {mHSTerminalIDName}
    ::= oc−mhs−terminal−id

mHSTerminalIDName ATTRIBUTE
    WITH ATTRIBUTE−SYNTAX
            caseIgnoreStringSyntax (SIZE (1..ub−terminal−id−length))
    ::= at−mhs−terminal−id−name


mHSNumericUserIdentifier OBJECT−CLASS
    SUBCLASS OF top
    MUST CONTAIN {mHSNumericIdentifierName}
    ::= oc−mhs−numeric−user−id

mHSNumericeUserIdentifierName ATTRIBUTE
    WITH ATTRIBUTE−SYNTAX
            caseIgnoreStringSyntax (SIZE (1..ub−numeric−user−id−length))
    ::= at−mhs−numeric−user−id−name
```

Figure 3: O/R Address Hierarchy

Some choices of interest that are made in this hierarchy:

- The representation is defined so that it is straightforward to make a mechanical transformation in either direction. This requires that each node is named by an attribute whose type can determine the mapping.
- Where there are multiple domain defined attributes, the first in the sequence is the most significant.
- Physical Delivery (postal) addresses are not represented in this hierarchy. This is primarily because physical delivery can be handled by the Access Unit routing mechanisms defined in [3], and there is no need for this representation.
- Terminal and network forms of address are not handled, except for X.121 form, which is useful for addressing faxes.
- MHSCountry is defined as a subclass of Country, and so the same entry will be used for MHS Routing as for the rest of the DIT.

- The numeric country code will be an alias.
- ADMD will always be present in the hierarchy. This is true in the case of "␣" and of "0". This facilitates an easy mechanical transformation between the two forms of address.
- Each node is named by the relevant part of the O/R Address.
- Aliases may be used in other parts of the tree, in order to normalise alternate values. Where an alias is used, the value of the alias should be present as an alternate value in the node aliased to. Aliases may not be used for domain defined attributes.
- Domain Defined Attributes are named by a multi-valued RDN (Relative Distinguished Name), consisting of the type and value. This is done so that standard attribute syntaxes can be used.
- Where an O/R Address has a valid Printable String and T.61 form, both must be present, with one as an alias for the other. When both are present in the O/R Address, either may be used to construct the distinguished name.
- Personal name is normalised into a string, according to RFC 1327 [6]. For some forms of personal name, such as one which includes TeletextString, this will lead to a "/=" encoding. This used of a string attribute is more convenient than having structure by name components, and allows for mailboxes to be cleanly used for both RFC 822 and X.400 routing [2, 5, 3].

  If this sharing is done, mailboxes must be specified using the printable string character set only. T.61 names should be restricted to X.400 only sites.

The relationship between X.400 O/R Addresses and the X.400 Entries (Attribute Type and Object Class) are given in Table 1. Where there are multiple Organisational Units or Domain Defined Attributes, each components is mapped onto a single X.500 entry.

## 2 Example Representation

The O/R Address:

```
I=S; S=Kille; OU=CS; O=UCL,
PRMD=UK.AC; ADMD=Gold 400; C=GB;
```

would be represented in the directory as:

```
CN=S.Kille, MHS-OU=CS, MHS-O=UCL,
PRMD=UK.AC, ADMD=Gold 400, C=GB
```

| O/R Address | Object Class | Naming Attribute |
|---|---|---|
| C | mHSCountry | countryName<br>or<br>mHSNumericCountryName |
| ADMD | aDMD | aDMDName |
| PRMD | pRMD | pRMDName |
| O | mHSOrganisation | mHSOrganisationName |
| OU | mHSOrganisationalUnit | mHSOrganisationalUnitName |
| PN | mHSPerson | personName |
| CN | mHSNamedObject | mHSCommonName |
| X121 | mHSX121 | mHSX121Address |
| T-ID | mHSTerminalID | mHSTerminalIDName |
| UA-ID | mHSNumericUserIdentifier | mHSNumericUserIdentifierName |
| DDA | mHSDomainDefinedAttribute | mHSDomainDefinedAttributeType<br>and<br>mHSDomainDefinedAttributeValue |

Table 1: O/R Address relationship to Directory Name

# 3 Mapping from O/R Address to Directory Name

The primary application of this mapping is to take an X.400 encoded O/R Address and to generate an equivalent directory name. This mapping is only used for selected types of O/R Address:

- Mnemonic form
- Numeric form
- Terminal form, where country is present and X121 addressing is used

Other forms of O/R address are handled by Access Unit mechanisms.

The O/R Address is treated as an ordered list, with the order as implied in Figure 2. For each O/R Address attribute, generate the equivalent directory naming attribute. In most cases, the mapping is mechanical. Printable String or Teletex encodings are chosen as appropriate. Where both forms are present in the O/R Address, the Teletex form only should be used to generate the distinguished name. There are two special cases:

1. A DDA generates a multi-valued RDN
2. The Personal Name is mapped to the attribute according to RFC 1327

In many cases, an O/R Address will be provided, and only the higher components of the address will be represented in the DIT. In this case, the "longest possible match" should be returned.

# 4 Underspecified O/R Addresses

X.400 requires that some underspecified O/R Addresses are handled in a given way. Where an underspecified O/R Address should be treated as if it were another O/R Address, an alias should be used. If the O/R Address should be rejected as ambiguous, and entry should be created in the DIT, and forced non-delivery specified for this reason.

# 5 Mapping from Directory Name to O/R Address

The reverse mapping is also needed in some cases. All of the naming attributes are unique, so the mapping is mechanically reversible.

# References

[1] The Directory — overview of concepts, models and services, December 1988. CCITT X.500 Series Recommendations.

[2] D.H. Crocker. Standard of the format of ARPA internet text messages. Request for Comments 822, University of Delaware, August 1982.

[3] S.E. Hardcastle-Kille. MHS use of the directory to support MHS routing, April 1992. Internet Draft.

[4] S.E. Hardcastle-Kille. Use of the directory to support mapping between X.400 and RFC 822 addresses, April 1992. Internet Draft.

[5] S.E. Hardcastle-Kille. Use of the directory to support routing for RFC 822 and related protocols, April 1992. Internet Draft.

[6] S.E. Kille. Mapping between X.400(1988) / ISO 10021 and RFC 822. Request for Comments 1327, Department of Computer Science, University College London, May 1992.

[7] CCITT recommendations X.400 / ISO 10021, April 1988. CCITT SG 5/VII / ISO/IEC JTC1, Message Handling: System and Service Overview.

# 6 Security Considerations

Security considerations are not discussed in this INTERNET–DRAFT .

# 7 Author's Address

Steve Hardcastle-Kille
ISODE Consortium
PO Box 505
London
SW11 1DX
England

Phone: +44-71-223-4062

EMail: S.Kille@ISODE.COM

DN: CN=Steve Hardcastle-Kille,
O=ISODE Consortium, C=GB

UFN: S. Hardcastle-Kille, ISODE Consortium, GB

# A Object Identifier Assignment

```
tree OBJECT IDENTIFIER ::= {mhs–ds 2}

oc OBJECT IDENTIFIER ::= {tree 1}
at OBJECT IDENTIFIER ::= {tree 2}

oc–admd OBJECT IDENTIFER ::= {oc 1}
oc–mhs–country OBJECT IDENTIFER ::= {oc 2}
oc–mhs–domain–defined–attribute OBJECT IDENTIFER ::= {oc 3}
oc–mhs–named–object OBJECT IDENTIFER ::= {oc 4}
oc–mhs–organisation OBJECT IDENTIFER ::= {oc 5}
oc–mhs–organisational–unit OBJECT IDENTIFER ::= {oc 6}
oc–mhs–person OBJECT IDENTIFER ::= {oc 7}
oc–mhs–x121 OBJECT IDENTIFER ::= {oc 8}
oc–prmd OBJECT IDENTIFER ::= {oc 9}
oc–mhs–terminal–id OBJECT IDENTIFER ::= {oc 10}
oc–mhs–numeric–user–id OBJECT IDENTIFER ::= {oc 11}

at–admd–name OBJECT IDENTIFER ::= {at 1}
at–mhs–common–name OBJECT IDENTIFER ::= {at 2}
at–mhs–domain–defined–attribute–type OBJECT IDENTIFER ::= {at 3}
at–mhs–domain–defined–attribute–value OBJECT IDENTIFER ::= {at 4}
at–mhs–numeric–country–name OBJECT IDENTIFER ::= {at 5}
at–mhs–organisation–name OBJECT IDENTIFER ::= {at 6}
at–mhs–organisation–name OBJECT IDENTIFER ::= {at 7}
at–mhs–organisation–name OBJECT IDENTIFER ::= {at 8}
at–mhs–person–name OBJECT IDENTIFER ::= {at 9}
at–prmd–name OBJECT IDENTIFER ::= {at 10}
at–x121–address OBJECT IDENTIFER ::= {at 12}
at–mhs–terminal–id–name OBJECT IDENTIFER ::= {at 13}
at–mhs–numeric–user–id–name  OBJECT IDENTIFER ::= {at 14}
```

Figure 4: Object Identifier Assignment