Network Working Group
INTERNET-DRAFT

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Representing the O/R Address hierarchy in the Directory Information Tree

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Abstract

This document defines a representation of the O/R Address hierarchy in the Directory Information Tree [MHS88, CCI88]. This is useful for a range of purposes, including:

- Support for MHS Routing [HK92a].
- Support for X.400/RFC 822 address mappings [Kil92, HK92b].

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.

*** need to tidy arrows on pictures (or get a new drawing package). All arrowheads should meet box edges. ***

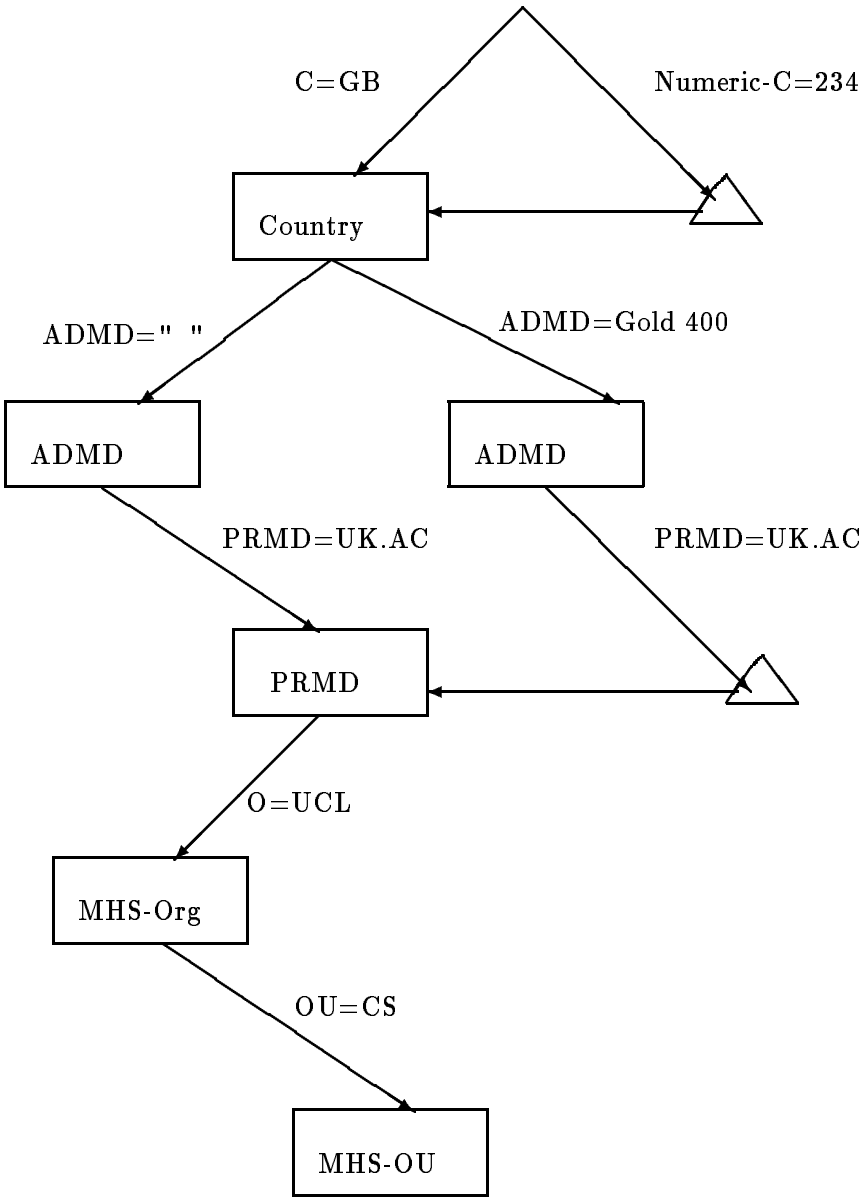

Figure 1: Example O/R Address Tree

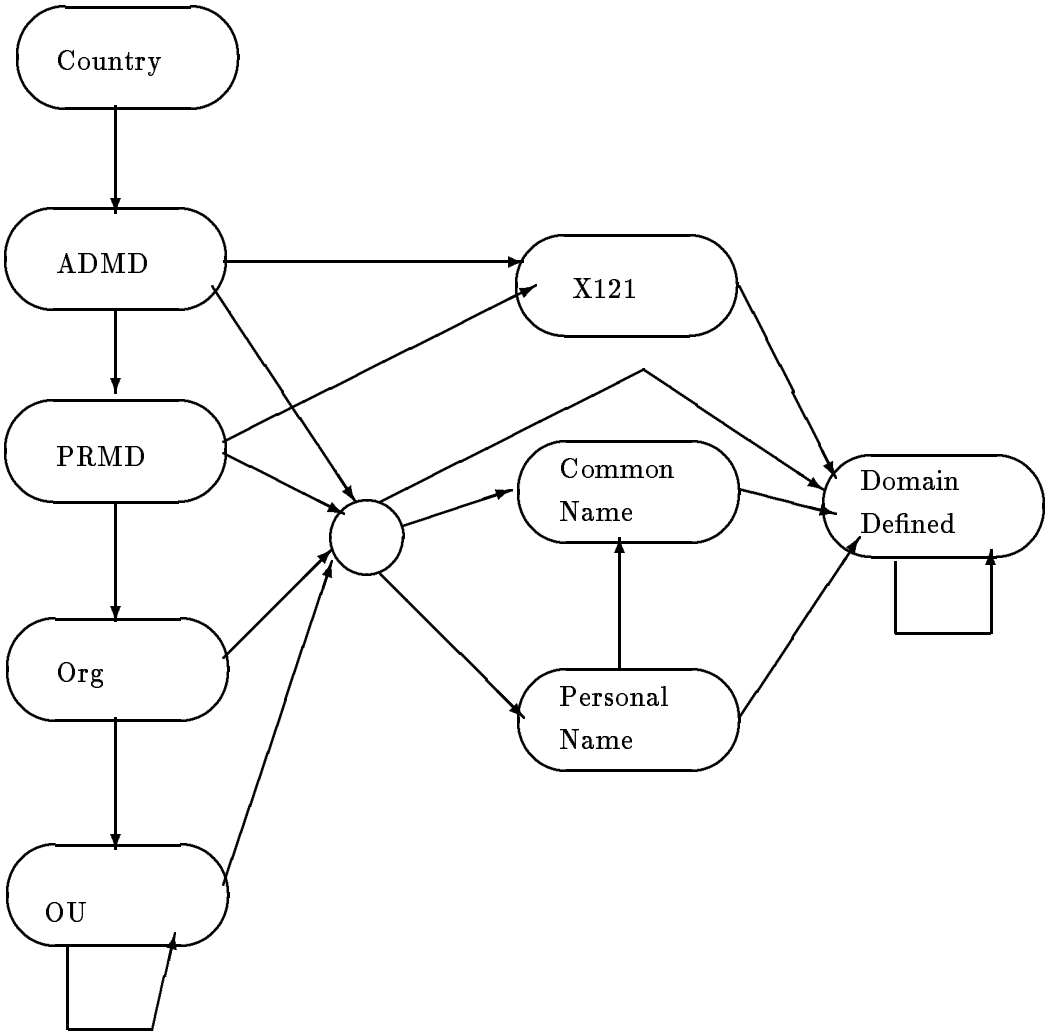

Figure 2: O/R Address Tree Schema

```
-- upper bounds are mostly imported from X.411

mHSCountry OBJECT-CLASS
   SUBCLASS OF  country
   MAY CONTAIN {
         countryName,                    -- one of these must be present
         mHSNumericCountryName }
   ::= oc-mhs-country
                                                                        10
mHSNumericCountryName ATTRIBUTE
   WITH ATTRIBUTE-SYNTAX
         NumericString (3..3)
   SINGLE VALUE
   ::= at-mhs-numeric-country-name

aDMD OBJECT-CLASS
   SUBCLASS OF top
   MUST CONTAIN {aDMDName }
   ::= oc-admd                                                          20

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                                                          30

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                                              40

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


mHSOrganisationalUnit OBJECT-CLASS
   SUBCLASS OF top                                                      50
   MUST CONTAIN {mHSOrganisationalUnitName }
   ::= oc-mhs-organisational-unit

mHSOrganisationalUnitName ATTRIBUTE
   SUBTYPE OF organizationalUnitName
   WITH ATTRIBUTE-SYNTAX
```

```
        caseIngoreStringSyntax (SIZE (1..ub-organizational-unit-name-length))
    ::= at-mhs-organisation-name

mHSPerson OBJECT-CLASS                                                    60
    SUBCLASS OF top
    MUST CONTAIN {personName}
    ::= oc-mhs-person

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

mHSNamedObject OBJECT-CLASS
    SUBCLASS OF top                                                       70
    MUST CONTAIN {mHSCommonName}
    ::= oc-mhs-named-object

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

mHSX121 OBJECT-CLASS                                                      80
    SUBCLASS OF top
    MUST CONTAIN {mHSX121Address}
    ::= oc-mhs-x121

mHSX121Address ATTRIBUTE
    WITH ATTRIBUTE-SYNTAX
        caseIngoreStringSyntax (SIZE (1..ub-x121-address-length))
    ::= at-mhs-organisation-name

mHSDomainDefinedAttribute OBJECT-CLASS                                    90
    SUBCLASS OF top
    MUST CONTAIN {
        mHSDomainDefineAttributeType,
        mHSDomainDefineAttributeValue}
    ::= oc-mhs-domain-defined-attribute

mHSDomainDefinedAttributeType ATTRIBUTE
    WITH ATTRIBUTE-SYNTAX
        caseIngoreStringSyntax
 (SIZE (1..ub-domain-defined-attribute-type-length))                     100
    SINGLE VALUE
    ::= at-mhs-domain-defined-attribute-type

mHSDomainDefinedAttributeValue ATTRIBUTE
    WITH ATTRIBUTE-SYNTAX
        caseIngoreStringSyntax
 (SIZE (1..ub-domain-defined-attribute-value-length))
    SINGLE VALUE
    ::= at-mhs-domain-defined-attribute-value
                                                                          110
```

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 [HK92a], and there is no need for this representation.

  Editors Note: It was agreed to put some Physical Delivery attributes into the hierarchy. I cannot understand why this was agreed. This should be discussed in Boston.

- 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 1148 [Kil90]. This 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 [Cro82, HK92c, HK92a].

O/R Address	Object Class	Naming Attribute
C	mHSCountry	countryName or mHSNumericCountryName
ADMD	aDMD	aDMDName
PRMD	pRMD	pRMDName
O	mHSOrganisation	mHSOrganisationName
OU	mHSOrganisationalUnit	mHSOrganisationalUnitName
PN	mHSPerson	personName
CN	mHSNamedObject	mHSCommonName
X121	mHSX121	mHSX121Address
DDA	mHSDomainDefinedAttribute	mHSDomainDefinedAttributeType and mHSDomainDefinedAttributeValue

Table 1: O/R Address relationship to Directory Name

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.

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
```

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

4 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

[CCI88] The Directory — overview of concepts, models and services, December 1988. CCITT X.500 Series Recommendations.

[Cro82] D.H. Crocker. Standard of the format of ARPA internet text messages. Request for Comments 822, University of Delaware, August 1982.

[HK92a] S.E. Hardcastle-Kille. MHS use of the directory to support MHS routing, April 1992. Internet Draft.

[HK92b] S.E. Hardcastle-Kille. Use of the directory to support mapping between X.400 and RFC 822 addresses, April 1992. Internet Draft.

[HK92c] S.E. Hardcastle-Kille. Use of the directory to support routing for RFC 822 and related protocols, April 1992. Internet Draft.

[Kil90] S.E. Kille. Mapping between X.400(1988) / ISO 10021 and RFC 822. Request for Comments 1148, DDN Network Information Center, SRI International, March 1990. Also available as MailGroup Note 23.

[Kil92] 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.

[MHS88] CCITT recommendations X.400 / ISO 10021, April 1988. CCITT SG 5/VII / ISO/IEC JTC1, Message Handling: System and Service Overview.

5 Security Considerations

Security considerations are not discussed in this INTERNET–DRAFT .

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A Object Identifier Assignment

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

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


at-admd-name OBJECT IDENTIFER ::= {oc 1}
at-mhs-common-name OBJECT IDENTIFER ::= {oc 2}
at-mhs-domain-defined-attribute-type OBJECT IDENTIFER ::= {oc 3}
at-mhs-domain-defined-attribute-value OBJECT IDENTIFER ::= {oc 4}
at-mhs-numeric-country-name OBJECT IDENTIFER ::= {oc 5}
at-mhs-organisation-name OBJECT IDENTIFER ::= {oc 6}
at-mhs-organisation-name OBJECT IDENTIFER ::= {oc 7}
at-mhs-organisation-name OBJECT IDENTIFER ::= {oc 8}
at-mhs-person-name OBJECT IDENTIFER ::= {oc 9}
at-prmd-name OBJECT IDENTIFER ::= {oc 10}


oc-admd OBJECT IDENTIFER ::= {at 1}
oc-mhs-country OBJECT IDENTIFER ::= {at 2}
oc-mhs-domain-defined-attribute OBJECT IDENTIFER ::= {at 3}
oc-mhs-named-object OBJECT IDENTIFER ::= {at 4}
oc-mhs-organisation OBJECT IDENTIFER ::= {at 5}
oc-mhs-organisational-unit OBJECT IDENTIFER ::= {at 6}
oc-mhs-person OBJECT IDENTIFER ::= {at 7}
oc-mhs-x121 OBJECT IDENTIFER ::= {at 8}
oc-prmd OBJECT IDENTIFER ::= {at 9
```

Figure 4: Object Identifier Assignment