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A String Representation of Distinguished Names (OSI-DS 23 (v3))

Status of this Memo

The OSI Directory uses distinguished names as the primary keys to entries in the directory. Distinguished Names are encoded in ASN.1. When a distinguished name is communicated between to users not using a directory protocol (e.g., in a mail message), there is a need to have a user-oriented string representation of distinguished name.

This specification defines a string format for representing names, which is designed to give a clean representation of commonly used names, whilst being able to represent any distinguished name.

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 <osi-ds@CS.UCL.AC.UK>.

Contents

1 Why a notation is needed

Many OSI Applications make use of Distinguished Names (DN) as defined in the OSI Directory [CCI88]. It is important to have a common format to be able to unambiguously represent a distinguished name. This might be done to represent a directory name on a business card or in an email message. There is a need for a format to support human to human communication, which must be string based (not ASN.1) and user oriented.

This notation is targeted towards a general user oriented system, and in particular to represent the names of humans. Other syntaxes may be more appropriate for other uses of the directory. For example, the OSF Syntax may be more appropriate for some system oriented uses.

2 A notation for Distinguished Name

2.1 Goals

The following goals are laid out:

- It should be intuitive for the majority of names encountered
- It should be fully general
- It should be possible to lay it out in a number of ways
- Is should be a clear representation of the distinguished name

2.2 Informal definition

This notation is designed to be convenient for common forms of name. Some examples are given. The author's directory distinguished name would be written:

```
CN=Steve Hardcastle-Kille, OU=Computer Science, O=University College London, C=GB
```

This may be folded, perhaps to display in multi-column format. For example:

```
CN=Steve Hardcastle-Kille,
OU=Computer Science,
O=University College London,
C=GB
```

Another name might be:

```
CN=Christian Huitema, O=INRIA, C=FR
```

Semicolon (";") may be used as an alternate separator.

```
CN=Christian Huitema; O=INRIA; C=FR
```

In running text, this would be written as <CN=Christian Huitema; O=INRIA; C=FR>. Another example, shows how different attribute types are handled:

```
CN=James Hacker
L=Basingstoke
O=Widget Inc
CN=GB
```

The final example shows quoting of a comma in an Organisation name:

```
CN=L. Eagle, O="Sue, Grabbit and Runn", C=GB
```

2.3 Formal definition

A formal definition can now be given. The structure is specified in a BNF grammar in Figure 1. This definition is in an abstract character set, and so may be written in any character set supporting the explictly defined special characters.

The quoting mechanism is used for the following cases:

- Strings containing ",", "+", "="or """ or <CR>
- Strings with leading or trailing spaces
- Strings containing consecutive spaces

There is an escape mechanism, so that this syntax may be used to print any valid distinguished name. This is ugly. It is expected to be used only in pathological cases. There are two parts:

1. Attributes types are represented in a (big-endian) dotted notation. (e.g., OID.2.6.53).
2. Attribute values are represented in hexadecimal (e.g. #0A56CF).

The keyword specification is optional. This is so that the same BNF may be used for the related specification on User Friendly Naming [HK92]. WHen this specification is followed, the attribute type keywords must always be present.

A list of valid keywords for well known attribute types used in naming is given in Table 1. This is a list of keywords which must be supported. These

```
<name> ::= <name-component> ( <spaced-separator> )
       | <name-component> <spaced-separator> <name>

<spaced-separator> ::= <optional-space>
                <separator>
                <optional-space>

<separator> ::=  "," ( <CR> ) | ";" ( <CR> )

<optional-space> ::= ( <CR> ) *( " " )

<name-component> ::= <attribute>
        | <attribute> <optional-space> "+" ( <CR> )
          <optional-space> <name-component>

<attribute> ::= <string>
        | <key> <optional-space> "=" <optional-space> <string>

<key> ::= 1*( <keychar> ) | "OID." <oid>
<keychar> ::= letters, numbers, and space

<oid> ::= <digitstring> | <digitstring> "." <oid>
<digitstring> ::= 1*<digit>
<digit> ::= digits 0-9

<string> ::= *( <stringchar> | <pair> )
         | '"' *( <stringchar> | <special> | <pair> ) '"'
 | "#" <hex>


<special> ::= "," | "=" | '"' | <CR> | "+" | ">" | "#" | ";"

<pair> ::= "\" ( <special> | "\" )
<stringchar> ::= any char except <special> or "\"

<hex> ::= 2*<hexchar>
<hexchar> ::= 0-9, a-f, A-F
```

Figure 1: BNF Grammar for Distinguished and Purported Name

Key	Attribute (X.520 keys)
CN	CommonName
L	LocalityName
ST	StateOrProvinceName
O	OrganizationName
OU	OrganizationalUnitName
C	CountryName

Table 1: Standardised Keywords

are chosen because they appear in common forms of name, and can do so in a place which does not correspond to the default schema used. If other attributes are used for naming, this can always be extended locally.

Only string type attributes are considered, but other attribute syntaxes could be supported locally. It is assumed that the interface will translate from the supplied string into PrintableString or T.61.

The "+" notation is used to specify multi-component RDNs. In this case, the types for attributes in the RDN must be explicit.

The name is presented/input in a little-endian order (most significant component last).

When an address is written in a context where there is a need to delimit the entire address (e.g., in free text), it is recommended that the delimiters <> are used. The terminator > is a special in the notation to facilitate this delimitation.

2.3.1 An Alternative Approach

An alternative approach is described in this section. It is NOT recommended by these guidelines. Whilst this approach has merits, it is diametrically opposite to the recommended approach. A mixture of both approaches is not beneficial.

This alternative is to use short names, which will be easily memorable by users (e.g., UCL for University College London, and CS for Computer Science). In general, the style of name component should be similar to that chosen for names in the domain system.

The benefit of this approach is that it will lead to mnemonic names, which are easy to remember and to type. The directory will then be able to operate mainly on the read operation, with much less use of the more expensive search operation.

It is argued that name conflicts may be dealt with by introducing more levels into the DIT.

3 Examples

This section gives a few examples of distinguished names written using this notation:

```
CN=Marshall T. Rose, OU=Dover Beach Consulting, L=Santa Clara,
ST=California, C=US

CN=FTAM Service, CN=Bells, OU=Computer Science,
OU=University College London, C=GB

CN=Steve Hardcastle-Kille,
OU=Computer Science,
O=University College London,
C=GB

CN=Steve Hardcastle-Kille, OU=Computer Science,
O=University College London, C=GB
```

References

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

[HK92] S.E. Hardcastle-Kille. Using the OSI directory to achieve user friendly naming. Request for Comments in preparation, Department of Computer Science, University College London, January 1992.

4 Security Considerations

Security considerations are not discussed in this INTERNET–DRAFT .

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DN: CN=Steve Hardcastle-Kille, OU=Computer Science,
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