

## A String Representation of LDAP Search Filters

### Status of this Memo

This memo provides information for the Internet community. This memo does not specify an Internet standard of any kind. Distribution of this memo is unlimited.

### Abstract

The Lightweight Directory Access Protocol (LDAP) [1] defines a network representation of a search filter transmitted to an LDAP server. Some applications may find it useful to have a common way of representing these search filters in a human-readable form. This document defines a human-readable string format for representing LDAP search filters.

### 1. LDAP Search Filter Definition

An LDAP search filter is defined in [1] as follows:

```
Filter ::= CHOICE {
    and                [0] SET OF Filter,
    or                 [1] SET OF Filter,
    not                [2] Filter,
    equalityMatch      [3] AttributeValueAssertion,
    substrings        [4] SubstringFilter,
    greaterOrEqual    [5] AttributeValueAssertion,
    lessOrEqual       [6] AttributeValueAssertion,
    present           [7] AttributeType,
    approxMatch       [8] AttributeValueAssertion
}

SubstringFilter ::= SEQUENCE {
    type      AttributeType,
    SEQUENCE OF CHOICE {
        initial [0] LDAPString,
        any    [1] LDAPString,
        final  [2] LDAPString
    }
}
```

```

AttributeValueAssertion ::= SEQUENCE
    attributeType  AttributeType,
    attributeValue  AttributeValue
}

```

```
AttributeType ::= LDAPString
```

```
AttributeValue ::= OCTET STRING
```

```
LDAPString ::= OCTET STRING
```

where the LDAPString above is limited to the IA5 character set. The AttributeType is a string representation of the attribute object identifier in dotted OID format (e.g., "2.5.4.10"), or the shorter string name of the attribute (e.g., "organizationName", or "o"). The AttributeValue OCTET STRING has the form defined in [2]. The Filter is encoded for transmission over a network using the Basic Encoding Rules defined in [3], with simplifications described in [1].

## 2. String Search Filter Definition

The string representation of an LDAP search filter is defined by the following BNF. It uses a prefix format.

```

<filter> ::= '(' <filtercomp> ')'
<filtercomp> ::= <and> | <or> | <not> | <item>
<and> ::= '&' <filterlist>
<or> ::= '|' <filterlist>
<not> ::= '!' <filter>
<filterlist> ::= <filter> | <filter> <filterlist>
<item> ::= <simple> | <present> | <substring>
<simple> ::= <attr> <filtertype> <value>
<filtertype> ::= <equal> | <approx> | <greater> | <less>
<equal> ::= '='
<approx> ::= '~='
<greater> ::= '>='
<less> ::= '<='
<present> ::= <attr> '=*'
<substring> ::= <attr> '=' <initial> <any> <final>
<initial> ::= NULL | <value>
<any> ::= '*' <starval>
<starval> ::= NULL | <value> '*' <starval>
<final> ::= NULL | <value>

```

<attr> is a string representing an AttributeType, and has the format defined in [1]. <value> is a string representing an AttributeValue, or part of one, and has the form defined in [2]. If a <value> must contain one of the characters '\*' or '(' or ')', these characters

should be escaped by preceding them with the backslash '\ ' character.

### 3. Examples

This section gives a few examples of search filters written using this notation.

```
(cn=Babs Jensen)
(!(cn=Tim Howes))
(&(objectClass=Person)(|(sn=Jensen)(cn=Babs J*)))
(o=univ*of*mich*)
```

### 4. Security Considerations

Security issues are not discussed in this memo.

### 5. References

- [1] Yeong, W., Howes, T., and S. Kille, "Lightweight Directory Access Protocol", RFC 1487, Performance Systems International, University of Michigan, ISODE Consortium, July 1993.
- [2] Howes, T., Kille, S., Yeong, W., and C. Robbins, "The String Representation of Standard Attribute Syntaxes", RFC 1488, University of Michigan, ISODE Consortium, Performance Systems International, NeXor Ltd., July 1993.
- [3] "Specification of Basic Encoding Rules for Abstract Syntax Notation One (ASN.1)", CCITT Recommendation X.209, 1988.

### 6. Author's Address

Tim Howes  
University of Michigan  
ITD Research Systems  
535 W William St.  
Ann Arbor, MI 48103-4943  
USA

Phone: +1 313 747-4454  
EMail: tim@umich.edu