A Minimum LDAPv3 White Pages Schema
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Abstract

Many different white pages schema proposals have been published for
use in LDAPv3 as well as other directory service protocols. While
these proposals define schema elements that are indeed useful in the
deployment of LDAPv3-based directory services, there are a few
problems common to the set of such proposals currently available to
implementors: inconsistent semantic and syntactic definitions of
similar attributes across schema, little or no semantic extensibility
of attribute definitions without changing source code for deployed
implementations, lack of standard object class definitions for
containing white pages meta schema elements, and lack of an attribute
grouping method. This document defines an object class for holding
IWPS attributes as mapped into existing and relatively few newly
defined extensible attribute types.

1.0 Introduction

The X.500 standards [X500] define many basic object classes, attribute types, syntaxes, and matching rules that are useful in the context of white pages directory services and applications. More recently, there have been a number of efforts ([LIPS], [RFC2218], [RFC2256], and [RFC2252]) to define object classes, attribute types, syntaxes, matching rules, and meta schema for use in building white pages applications. While this plethora of schema served as catalyst to early growth in a market acceptance of LDAP as a white pages technology of choice, it has become a barrier to true LDAP interoperability from the perspective of Intranet and Internet white pages directory service implementors and users.

This document makes use of existing white pages schema and meta schema elements and minimizes the creation of new elements to specify the minimum white pages schema for LDAPv3 interoperation.

2.0 Background and Intended Usage

The wpPerson object class is a general purpose object class that holds attributes about people. The attributes it holds were chosen to accommodate information requirements found in Internet and Intranet directory service deployments. The wpPerson object class is designed to be used within directory services based on the LDAP [RFC2251] and the X.500 family of protocols, and it may be useful in other contexts as well. Other attributes and auxiliary object classes defined in other documents MAY be included in white pages entries.

The attribute type and object class definitions are written using the BNF form of AttributeTypeDescription and ObjectClassDescription given in [RFC2252]. Lines have been folded for readability.

Attributes that are referenced but not defined in this document are included in the standard and pilot attribute definitions [RFC2256], in the labeledURI object class [RFC2079], or in the inetOrgPerson object class [IOPERSON].

BNF productions that are used, but not defined in this document are equivalent to those with the same name defined in [RFC822].

3.0 New Attribute Types Used in the wpPerson Object Class

3.1 objectGuid Attribute

{ 1.2.840.113556.1.4.2 NAME 'objectGuid'
EQUALITY octetStringMatch  
SYNTAX 1.3.6.1.4.1.1466.115.121.1.40  
SINGLE-VALUE USAGE directoryOperation )

3.2 mimeContent

The mimeContent attribute contains one or more values whose encodings are MIME contents [MIME]. Examples of MIME contents include images and sounds.

( OID-TBD NAME 'mimeContent' EQUALITY octetStringMatch  
SYNTAX OID-TBD )

Labels for the mimeContent attribute can be provided using the Content Transfer Disposition mechanism defined in [MIME].

4.0 New Syntactic Grammars

The following paragraphs define extensible syntactic grammars for specific attributes used in implementing white pages directory services. The mechanism used to enable extensibility is referred to as labelling. Contextual semantic labels, which may be used alone or in combination, are defined for each such attribute. Other such attribute labels MAY be defined in other documents.

4.1 telephoneNumber Attribute

labeled-number = telephonenumber [ "(" parameters ")" ]

telephonenumber = printablestring ; SHOULD be based on E.163

parameters = ( whsp parm whsp ) / ( parm "$" parameters )

parm = numericoid / telephone-label

television-label = "home" ; a residential telephone number  
/ "work" ; a business telephone number  
/ "fax" ; a facsimile telephone number  
/ "modem" ; a telephone number answered by a MODEM  
/ "voice" ; a voice telephone number  
/ "msg" ; a telephone number with voice mail  
/ "pref" ; a preferred telephone number  
/ "pager" ; a pager telephone number  
/ "cell" ; an analog cellular telephone number  
/ "car" ; a car cellular telephone number  
/ "isdn" ; an international ISDN telephone number  
/ "pcs" ; a digital PCS telephone number  
/ "temp" ; a temporary telephone number
4.2 mail Attribute

labeled-mail = mail [ "(" parameters ")" ]

mail = <any CHAR except specials, CTL, CRLF, wspc>

parameters = ( whsp parm whsp ) / ( parm "$" parameters )

parm = vendor-specific / mail-label

vendor-specific = numericoid

mail-label = "personal" ; a personal email address
   / "work"     ; a business email address
   / "pref"     ; a preferred email address
   / "temp"     ; a temporary email address
   / "vpim"     ; an RFC822 address for a [VPIM] mailbox
   / "internet" ; a general purpose RFC822 address

4.3 postalAddress Attribute

labeled-postal = postalAddress [ "$" "(" parameters ")" ]

postalAddress = <a postalAddress value as defined in [RFC2256]>

parameters = ( whsp parm whsp ) / ( parm "$" parameters )

parm = numericoid / postal-label

postal-label = "home"     ; a residential postal address
   / "work"     ; a business postal address
   / "pref"     ; a preferred postal address
   / "temp"     ; a temporary postal address

4.4 organization Attribute

labeled-organization = organization [ "$" "(" parameters ")" ]

organization = <an organization attribute value of syntax defined in [RFC2256]>

parameters = ( whsp parm whsp ) / ( parm "$" parameters )

parm = numericoid / org-label

org-label = "home" ; a personal organization name
   / "work" ; a business or professional organization name
   / "temp" ; a temporary organization name
4.5 locality Attribute

labeled-locality = locality [ "$" "(" parameters ")" ]

locality = <a locality attribute value of syntax defined in [RFC2256]>

parameters = ( whsp parm whsp ) / ( parm "$" parameters )

parm = numericoid / locality-label

locality-label = "home" ; a locality associated with a person’s residence

/ "work" ; a locality associated with a business location

/ "temp" ; a locality associated with a temporary location

4.6 title Attribute

labeled-title = title [ CRLF "(" parameters ")" ]

title = <a title attribute value of syntax defined in [RFC2256]>

parameters = ( whsp parm whsp ) / ( parm "$" parameters )

parm = numericoid / title-label

title-label = "personal" ; a personal title

/ "work" ; a business title

/ "pref" ; a preferred title

4.7 description Attribute

labeled-descr = description [ CRLF "(" parameters ")" ]

description = <a description attribute value of syntax defined in [RFC2256]>

parameters = ( whsp parm whsp ) / ( parm "$" parameters )

parm = numericoid / descr-label

descr-label = "home" ; a personal description

/ "work" ; a business description

/ "pref" ; a preferred description

4.8 MIME Content Syntax
(This is a new syntax)

The MIME Content syntax has the following definition:

```
( TBD NAME 'MIME Content' )
```

The contents of a value of an attribute with this syntax is a MIME content encoded according to [MIME]. Content Transfer Encodings may be used, however transfer of LDAP values can be assumed to be 8 bit clean.

An example value in this syntax is provided below. Lines are wrapped for readability. "\r\n" is used to indicate a CRLF pair.

```
Content-Type: text/plain\r\nContent-Transfer-Encoding: 8bit\r\n\r
Hello world\r\n```

5.0 Language Tags

Language tags as specified in [LANGTAGS] MAY be used for the following wpPerson attributes: title, description, and postalAddress. Language tags MAY also be used with other attributes.

6.0 Operational Attributes

The LDAPv3 operational attributes createTimestamp, creatorsName, modifyTimestamp, and modifiersName SHOULD be used. These attributes corresponding to the ancillary attributes defined in [RFC2218].

7.0 Naming Attributes

Naming of wpPerson entries is a subject for other documents.

8.0 Definition of the wpPerson Object Class

The wpPerson object class represents people who are associated with an organization, ISP, or on-line service connected to the Internet. It is a structural class and is derived from the Person object class.

This object class definition includes the LDAP attribute types required to form attributes defined in [RFC2218] and [LIPS] when used in combination with the attribute labelling techniques defined above. Specific attribute types that express in the attribute type name the same information as that expressible using the attribute labels defined above are not included in this objectclass definition; all attributes fitting this description are included as allowable attribute types in an auxiliary compatibility object class defined in section 9.0.
See paragraph 8.1 for the mapping of IWPS attributes to wpPerson LDAPv3 attribute types.

( OID-TBP
  NAME 'wpPerson'
  SUP person
  STRUCTURAL
  MUST ( objectGuid
  )
  MAY ( #
      # the attribute values of the following types
      # SHOULD be labelled using the conventions
      # defined in section 4.0
      # mail $
      telephoneNumber $
      postalAddress $
      c $
      title $
      description $
      #
      # the attribute values of the following types
      # MUST NOT be labelled using the conventions
      # in section 4.0
      #
      manager $
      ou $
      userCertificate $
      givenName $
      generationQualifier $
      initials $
      middleName $
      preferredLanguage $
      mimeContent $
      #
      # the following attribute should be labelled
      # according to the convention specified in [RFC2079]
      # labeledURI
  )
)
### 8.1 IWPS to LDAPv3 wpPerson Object Class Mapping

<table>
<thead>
<tr>
<th>IWPS Field Name</th>
<th>wpPerson Attribute</th>
<th>label(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Email</td>
<td>mail</td>
<td>see 4.1</td>
</tr>
<tr>
<td>Cert</td>
<td>userCertificate</td>
<td>N/A</td>
</tr>
<tr>
<td>Home Page</td>
<td>labeledURI</td>
<td>home AND/OR work</td>
</tr>
<tr>
<td>Common Name</td>
<td>cn</td>
<td>N/A</td>
</tr>
<tr>
<td>Given Name</td>
<td>givenName</td>
<td>N/A</td>
</tr>
<tr>
<td>Surname</td>
<td>sn</td>
<td>N/A</td>
</tr>
<tr>
<td>Organization</td>
<td>o</td>
<td>home OR work</td>
</tr>
<tr>
<td>Locality</td>
<td>l</td>
<td>home AND/OR work</td>
</tr>
<tr>
<td>Country</td>
<td>c</td>
<td>N/A</td>
</tr>
<tr>
<td>Language Spoken</td>
<td>preferredLanguage</td>
<td>N/A</td>
</tr>
<tr>
<td>Personal Phone</td>
<td>telephoneNumber</td>
<td>home AND voice</td>
</tr>
<tr>
<td>Personal Fax</td>
<td>telephoneNumber</td>
<td>home AND fax</td>
</tr>
<tr>
<td>Personal Mobile Phone</td>
<td>telephoneNumber</td>
<td>home AND mobile</td>
</tr>
<tr>
<td>Personal Pager Number</td>
<td>telephoneNumber</td>
<td>home AND pager</td>
</tr>
<tr>
<td>Personal Postal Address</td>
<td>postalAddress</td>
<td>home</td>
</tr>
<tr>
<td>Description</td>
<td>description</td>
<td>home OR work</td>
</tr>
<tr>
<td>Title</td>
<td>title</td>
<td>home OR work</td>
</tr>
<tr>
<td>Office Phone</td>
<td>telephoneNumber</td>
<td>work AND voice</td>
</tr>
<tr>
<td>Office Fax</td>
<td>telephoneNumber</td>
<td>work AND fax</td>
</tr>
<tr>
<td>Office Mobile Phone</td>
<td>telephoneNumber</td>
<td>work AND mobile</td>
</tr>
<tr>
<td>Office Pager</td>
<td>telephoneNumber</td>
<td>work AND pager</td>
</tr>
<tr>
<td>Office Postal Address</td>
<td>postalAddress</td>
<td>work</td>
</tr>
<tr>
<td>Creation Date</td>
<td>createTimestamp</td>
<td>N/A</td>
</tr>
<tr>
<td>Creator Name</td>
<td>creatorsName</td>
<td>N/A</td>
</tr>
<tr>
<td>Modified Date</td>
<td>modifyTimestamp</td>
<td>N/A</td>
</tr>
<tr>
<td>Modifier Name</td>
<td>modifiersName</td>
<td>N/A</td>
</tr>
</tbody>
</table>

### 8.2 LIPS to LDAPv3 wpPerson Object Class

TBP.
9.0 wpCompatible Object Class

The wpCompatible object class has been defined to provide backward compatibility with deployed LDAPv3 implementations that support either [LIPS] or [RFC2218].

( OID-TBP
  NAME 'wpCompatible'
  AUXILIARY
  MAY (
    personalTitle $ 
    homePhone $ 
    homeFax $ 
    homePostalAddress $ 
    facsimileTelephoneNumber $ 
    mobile $ 
    pager $ 
    MHSORAddress $ 
    roomNumber $ 
    telexNumber $ 
    thumbnailPhoto $ 
    thumbnailLogo $ 
    uid
  )
)

10.0 Example of a wpPerson Entry

The following example is expressed using the LDIF notation defined in [LDIF].

dn: cn=Barbara Jensen, ou=Product Development, o=Ace Industry, c=US
objectClass: top
objectClass: person
objectClass: wpPerson
cn: Barbara Jensen
cn: Babs Jensen
sn: Jensen
givenName: Barbara
title;lang-en: manager, product development
mail: bjensen@aceindustry.com (work $ pref)
mail: bjensen@bjj.isp.net (home)
telephoneNumber: +1 408 555 1862 (voice $ msg $ work $ pref)
telephoneNumber: +1 408 555 1992 (fax $ work)
telephoneNumber: +1 408 555 1941 (mobile)
preferredLanguage: fr
preferredLanguage: en-gb
preferredLanguage: en
labeledURI: http://www.aceindustry.com/users/bjensen work

11.0 Security Considerations

Attributes of directory entries are used to provide descriptive information about the real-world objects they represent, which can be people, organizations or devices. Most countries have privacy laws regarding the publication of information about people.

Transfer of cleartext passwords (e.g., a clear-text userPassword value) are strongly discouraged where the underlying transport service cannot guarantee confidentiality and may result in disclosure of the password to unauthorized parties.

12.0 Acknowledgments

The engineering team for the schema specified in this document:

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Tim Howes - Netscape Communications Corp.
Mark Wahl - Critical Angle Inc.
Chris Weider - Microsoft Corp.

13.0 References


[MIME] [RFC2045] [RFC2046] [RFC2047].


[RFC2046] N. Freed & N. Borenstein, "Multipurpose Internet Mail..."
Extensions (MIME) Part Two: Media Types", RFC 2046, November 1996.


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15.0 Appendix A - Open Issues

15.1 jpegPhoto, photo, and audio syntaxes are too limiting

We have defined a new attribute type named mimeContent that supports extensible syntaxes based on MIME content-types.

We need to add examples to this document demonstrating how this syntax can be used to construct attributes that would normally have as a value image or audio data encoded according to a non-extensible image or audio syntax.

15.2 Specify Meta Syntax for Labelled Attributes?

15.3 New Matching Rules for Labelled Attributes?

15.4 Use of Surname Attribute

The Person object class defined by X.520 requires that the surname attributes be present in all entries from the person object class. In some cultures, there may not be a clear distinction between name components. Future versions of this document may define how to represent names which do not have a surname.

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