

Mfmod_ldap

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1 Overview

This package adds LDAP support to `mailfromd`, a powerful mail filtering utility designed for use with mail transport agents supporting the *militer* protocol.

It is written as a loadable module (see Section “`mfmmod`” in *Mailfromd Manual*) and requires `mailfromd` version 8.14.91 or later.

This document supposes that the reader is sufficiently acquainted with `mailfromd` and LDAP basics.

For a complete description of `mailfromd`, refer to *Mailfromd Manual*.

2 Configuration

LDAP functions take their configuration from file `ldap.conf`, searched in the *LDAP configuration path*, which is initialized as `‘/etc:/etc/ldap:/etc/openldap’`. Directories in that path are scanned sequentially until the file `ldap.conf` is found in one of them. The file is then read, and further scanning stops¹. The format of the configuration file is described elsewhere (see Section “`ldap.conf`” in *ldap.conf manpage*). `mfmmod_ldap` uses the following settings:

<code>uri</code>	[LDAP setting]
Specifies the URI of an LDAP server or servers to which the <code>mfmmod_ldap</code> should connect.	
<code>base</code>	[LDAP setting]
The default base DN to use when performing ldap operations.	
<code>ldap_version</code>	[LDAP setting]
Version of the LDAP protocol to use. Valid values are 2 and 3 (default).	
<code>binddn</code>	[LDAP setting]
Specifies the default bind DN to use when performing ldap operations.	
<code>bindpw</code>	[LDAP setting]
Specifies the password of <code>binddn</code> .	
<code>bindpwfile</code>	[LDAP setting]
A more secure alternative to <code>bindpw</code> . It specifies the name of a (plaintext) file from which to read the password. Note that the file is read verbatim, which means that it should not end with a newline (unless it is part of the password, of course).	
<code>tls</code>	[LDAP setting]
Configures TLS. The allowed values for this setting are:	
<code>yes</code>	Use TLS when possible.
<code>only</code>	Use of TLS required. If TLS is not available, binding will fail.
<code>no</code>	Don't use TLS.

¹ See `[set_config_path]`, page 4, for a discussion of how to modify the LDAP configuration path.

`tls_cacert` [LDAP setting]
 Specifies the file that contains certificates for all of the Certificate Authorities the client will recognize.

3 Basic Usage

To load `mfmod_ldap` into your MFL program, first make sure that `mailfromd` search path (see Section “include search path” in *Mailfromd Manual*) contains directory where the `ldap.mf` interface file is installed, and the search path for dynamically loaded modules (see Section “mfmod-path” in *Mailfromd Manual*) contains directory where the loaded library `mfmod_ldap.so` resides. Once these prerequisites are met, add the `require` statement:

```
require 'ldap'
```

To look up objects in the database, use the `search` function. It takes two mandatory and arbitrary number of optional arguments. First argument supplies the *base DN* to use. If an empty string is given, the `basedn` value from `ldap.conf` will be used instead. Second argument gives the *filter* string to use. Additional arguments specify the names of attributes to retrieve.

For example, the following statement looks for objects with the `uid` attribute matching the variable `user` and retrieves the `cn` and `telephoneNumber` attributes.

```
number rd search('ou=people,dc=example,dc=org',
                "(uid=%user)", "cn", "telephoneNumber")
```

The function returns *result set descriptor*, a non-negative integer value identifying the *result set* returned by the search. The result set has zero or more *entries* describing objects in the database that satisfy the filter. The number of entries can be obtained by calling `search_result_count_entries`. At each moment of time, there is a *current entry*, from which attributes and their values can be obtained. To switch to the next entry in the set and make it current, use the `search_result_next_entry` function.

The following example illustrates the usual approach for scanning result sets: it prints the values of ‘`cn`’ attributes for each object in the database.

```
number rd search('', '(objectClass=*)', 'cn')
loop
do
  echo search_result_attr_value_get(rd, 'cn', 0)
done while search_result_next_entry(rd)
search_result_free(rd)
```

The `search_result_attr_value_get` function retrieves the value of the attribute named in its second argument. Its third arguments gives the index of the value, if the attribute can have multiple values.

Notice the use of `search_result_free` function after the loop: when the result is no longer needed, it must be disposed of using that function. It reclaims the resources associated with the result set and returns its descriptor to the pool of available ones.

4 Functions

This chapter discusses functions exported from the `mfmod_ldap` module. The functions are grouped by their purpose.

4.1 Search

number search (*string basedn, string filter, ...*) [Function]
 Searches for objects matching *filter* in DN *basedn* and retrieves attributes specified by the variable arguments. If *basedn* is an empty string, the `base` setting from the `ldap.conf` file is used.
 On success, returns a non-negative *result set descriptor*.
 On error, it raises the `e_failure` exception (see Section “Built-in Exceptions” in *Mailfromd Manual*) with an appropriate explanatory message.

void search_result_free (*number rd*) [Function]
 Reclaims the memory and other resources allocated for the result set *rd*. Use this function when the result set is no longer needed.
 If *rd* does not refer to a valid result set, the function reports the `e_range` exception.

4.2 Operations on result sets

The functions below take result set descriptor as their first argument (*rd*), returned by a previous call to `search`. If the descriptor does not refer to a valid result set, they raise the `e_range` exception.

string search_result_dn (*number rd*) [Function]
 Returns DN of the returned LDAP object.

number search_result_count_entries (*number rd*) [Function]
 Returns count of entries in the result.

boolean search_result_next_entry (*number rd*) [Function]
 Selects the next entry in the result set.
 The function returns `true` (1) on success and `false` (0) if all entries in the result set have already been visited.

number search_result_count_attrs (*number rd*) [Function]
 Returns number of attributes available in each entry of the result set *rd*.

string search_result_attr_name (*number rd, number n*) [Function]
 Returns name of the *n*th attribute in the result set *rd*.
 If *n* is negative or is greater than the actual number of attributes, the `e_range` exception is raised.

number search_result_attr_value_count (*number rd, string attr*) [Function]
 Returns number of values for the attribute *attr* in the current entry of the result set *rd*.

`string search_result_attr_value_get` (*number rd, string attr,* [Function]
number n)

Retrieves *n*th value of the attribute *attr* from the current entry of the result set *rd*. If *n* is negative or is greater than the actual number of values retrieved for that attribute (as reported by `search_result_attr_value_count`), the `e_range` exception is raised.

4.3 Auxiliary functions

`void set_debug_level` (*number lev; number ldap_lev*) [Function]
Sets debug levels: *lev* is the module-specific debug level and the optional *ldap_lev* is the LDAP library debug level.

`string get_config_path` () [Function]
Returns current value of the LDAP configuration path.

`void set_config_path` (*string path*) [Function]
Sets the LDAP configuration path. The *path* argument is a colon-delimited list of directory names where to look for the `ldap.conf` file.

5 LDAP as a DBM Database

You can use LDAP as a storage backend for DBM database, accessible using MFL `db*` functions (see Section “Database functions” in *Mailfromd Manual*). Any number of such *databases* can be defined, allowing for different key \Rightarrow value mappings.

An LDAP-backed database is defined using the following function:

`void ldap_define_db` (*string name, string base, string get_filter,* [Function]
string resp_fmt, string seq_filter, string key_fmt)

Defines new database. Arguments:

name Name of the database. The new database can be accessed as ‘`ldap://name`’.

base Base DN. If empty, the default base DN (as configured in `ldap.conf` will be used.

get_filter Template string for generating LDAP filter for use by `dbget` routine. It can get refer to at most one input attribute using the syntax ‘`$attr`’ or ‘`${attr}`’. For example, if this argument is given as

‘`(&(objectClass=posixAccount)(uid=$uid))`’

then the call to ‘`dbget("smith")`’ will use the following filter string when accessing the LDAP database: ‘`(&(objectClass=posixAccount)(uid=smith))`’.

resp_fmt A *format* string used to convert the returned LDAP object to a string. It can refer to object’s attributes using the same syntax as described for *get_filter*. Any number of attribute references is allowed. Example:

‘ `"$cn" <$mail>`’

seq_filter Template string used to generate filter for sequential access to the database (see Section “dbm-seq” in *Mailfromd Manual*). It will be used as is, no attribute references are allowed.

Normally this filter is a sub-set of *get_filter*, e.g.:

```
'(objectClass=posixAccount)'
```

key_fmt A format string used to convert the returned LDAP object to a key string. The syntax is as described under *resp_fmt*. Calling *dbget* with the resulting string as argument must return the object used as input to generate the key.

An example usage:

```
prog begin
do
  ldap_define_db('users', 'ou=People,dc=example,dc=org',
                 '(&(objectClass=posixAccount)(uid=${uid}))',
                 '$cn <$mail>',
                 '(objectClass=posixAccount)',
                 '$uid')
done
```

The defined database maps the user ID to their full email address. It can be addressed as ‘ldap://users’. For example:

```
set email dbget('ldap://users')
```

or

```
#pragma dbprop users ldap://
...
set email dbget('users')
```

The following code fragment illustrates the use of sequential access functions to list all user emails:

```
#pragma dbprop users ldap://

func main(...)
  returns number
do
  loop for number dbn dbfirst('users')
  do
    echo dbkey(dbn)." ".dbvalue(dbn)
  done while dbnext(dbn)
done
```

6 Downloads and Other Links

The program can be downloaded from https://download.gnu.org.ua/release/mfmod_ldap.

The source repository is available at https://git.gnu.org.ua/mfmod_ldap.git/.

The package development page is at https://puszcza.gnu.org.ua/projects/mfmod_ldap.

Mailfromd home page is: <https://www.gnu.org.ua/software/mailfromd>.

7 Bug Reports

If you think you found a bug in `mfmod_ldap` or in its documentation, please send a mail to gray@gnu.org (Sergey Poznyakoff) or use the bug tracker at https://puszcza.gnu.org.ua/bugs/?group=mfmod_ldap (requires authorization).

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