LDAP v1.2

by Brainy Data Limited

About LDAP

LDAP is an Omnis Classic and Studio compatible external set of commands. Both Win32 and Mac OSX platforms are supported.

The following is a brief description of the various parts of this software.

- The LDAP external implements the LDAP commands. Place this file in your *External* folder.
- The example library ldap.lbr or ldap.lbs. The library implements a practical example relating to the use of the LDAP commands.
- The LDAP middle ware (Windows only) consisting of the files LDAPSDK.DLL, LDAPX.DLL, LDAPSSL.DLL, NMAS.DLL, NMASMSG.DLL and GSSKRB5.DLL. Place these files in the Omnis folder or the windows system folder.

Installing the Software

Place the external shared library LDAP (LDAP.DLL on windows) into the *External* folder of your OMNIS tree.

On Windows only, place the LDAP middle ware files LDAPSDK.DLL, LDAPX.DLL, LDAPSSL.DLL, NMAS.DLL, NMASMSG.DLL and GSSKRB5.DLL into the Omnis root folder or the Windows System folder.

You can open the example library directly from the LDAP folder.

Deploying your software

Please refer to the license agreement for rules on deployment.

Documentation

This documentation describes the functionality provided by the external.

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Changes

Version	Description
v1.2	unicode/studio 5 support
	new command LDAP USE UTF8.



Introduction

Overview

The LDAP software consists of the following

- 1. The LDAP example window in the "ldap.lbs" library.
- 2. The external commands library LDAP (LDAP.DLL on windows)

Examples

The example library implements a single window that shows you how to connect to an LDAP server and return a result.

External component Library

The external commands library provides a number of LDAP related commands. In the method editor's commands list, navigate to the external group and you should see a series of commands beginning with LDAP. If you cannot see these commands, please make sure you have installed the software correctly and restart your Omnis.

For a description of the external commands please read the chapter External Commands Reference



Designing LDAP

This chapter gives a brief description of what is involved to connect to an LDAP server and return a result. An assumption is made that you have a working LDAP server and that you are familiar with the LDAP language. For a detailed description of the supported commands please read the chapter External Commands Reference. The LDAP example library implements a functional interface for connecting to an LDAP server and searching and manipulating entries in an LDAP database.

Check the LDAP middle ware.

Before you can connect to your server you must make sure that your LDAP middle ware is functioning correctly. To do this you execute the LDAP AVAILABLE command.

Example:

```
LDAP AVAILABLE Returns #F

If flag true

;; LDAP is available

Else

;; LDAP is not available - Check the installation

End If
```

Connecting to an LDAP server.

Connecting to an LDAP server requires the execution of the two commands LDAP INIT and LDAP SIMPLE BIND S. LDAP INIT connects to the actual server using the given host name and port, and LDAP BIND SIMPLE S will establish your access rights using the given DN (Distinguished Name) and password.

When connecting to an LDAP version 3 compliant server you should tell the external to use UTF8 characters for communications using the LDAP USE UTF8 command.

The following example connects to a server and then disconnects using LDAP UNBIND S.

Example:

Searching an LDAP database

Searching an LDAP database and dissecting the result involves a series of commands. First you call LDAP SEARCH EXT S with a scope and a filter. Then you use LDAP FIRST ATTRIBUTE and LDAP NEXT ATTRIBUTE together with LDAP GET VALUES.

Example:

The following example connects to a server and then disconnects using LDAP UNBIND S.

Searching MS Active Directory

The Omnis LDAP external is build against traditional LDAP client software. When connecting to a Microsoft Active Directory server some searches may not work correctly, in particular when searching root level directories using LDAP_SCOPE_ONELEVEL or LDAP_SCOPE_SUBTREE.



External Commands Reference

This chapter documents the external commands provided by the LDAP software.

LDAP Commands

Please note: where constant names are given, these must be specified as text. Classic style externals have no means of providing constants for the use with Omnis.

LDAP ADD ATT (Collection, Name, Value)

LDAP ADD ATT adds an attribute and its value to an attribute collection. Attribute collections are used for the attribute parameters in the LDAP ADD EXT S and LDAP MODIFY EXT S functions.

Collection (Char)	Specifies the collection.
Name (Char)	Specifies the name.
Value (Char)	Specifies the value.
Returns	The updated collection is returned.
See also LDAP ADD	EXT S, LDAP MODIFY EXT S, LDAP SET ATT,
LDAP GET ATT, LD	AP GET ATT ARRAY ITEM

LDAP ADD EXT S (Session, DN, Attributes, ServerControls, ClientControls)

Synchronously adds an entry to the directory using LDAP client or server controls.

Session (Char)	Specifies the session (as returned by LDAP INIT).	
DN (Char)	Specifies the distinguished name of the entry to add, for example "cn=kim".	
Attributes (Char)	A collection of attributes and values to add with the entry. See LDAP ADD ATT.	
ServCtrls (Char)	Reference to server controls. Specify an empty string if no server controls.	
ClientCtrls (Char)	Reference to client controls. Specify an empty string if no client controls.	
Returns	See LDAP Error Codes.	
See also LDAP DELETE EXT S LDAP MODIFY EXT S LDAP ADD ATT		

See also LDAP DELETE EXT S, LDAP MODIFY EXT S, LDAP ADD AT

LDAP AVAILABLE ()

LDAP AVAILABLE returns a boolean state indicating whether the LDAP functions are

available. If this returns kFalse then please refer to the installation instructions. See also LDAP INIT

LDAP COMPARE S (Session, DN, Attributes, Value)

Synchronously determines whether a specified entry contains a specified attribute value.

Session (Char)	Specifies the session (as returned by LDAP INIT).
DN (Char)	Specifies the distinguished name of the entry to compare.
Attributes (Char)	Specifies the name of the attribute to compare.
Value (Char)	Specifies the string value of the attribute to compare.
Returns	0 (True), 1(False),2 (no such attribute), 3(No such object). If other value then see LDAP Error Codes.

LDAP COUNT ENTRIES (Session, Search Reference)

Counts the number of entries in the search.

Session (Char)	Specifies the session (as returned by LDAP INIT).
Reference (Char)	Reference to the result chain as returned by LDAP RESULT or by a synchronous search function.
Returns	the number of LDAP messages that are of type LDAP_RES_SEARCH_ENTRY.

See also LDAP RESULT, LDAP SEARCH EXT S

LDAP COUNT MESSAGES (Session, Search Reference)

Counts the number of messages in the search.

Character SessionSpecifies the session (as returned by LDAP INIT).Character ReferenceReference to the result chain as returned by LDAP RESULT or by
a synchronous search function.Returnsthe number of LDAP messages that are of any type.

See also LDAP RESULT, LDAP SEARCH EXT S

LDAP COUNT REFERENCES (Session, Search Reference)

Counts the number of references in the search.

Session (Char)	Specifies the session (as returned by LDAP INIT).
Reference (Char)	Reference to the result chain as returned by LDAP RESULT or by a synchronous search function.

Returns

the number of LDAP messages that are of type LDAP_RES_SEARCH_REFERENCE.

See also LDAP RESULT, LDAP SEARCH EXT S

LDAP CREATE PERSISTENT SEARCH CONT (Session,Type,ChangesOnly,ReturnEntryChanges,IsCritical,Control)

Creates and encodes a persistent search control. The control can then be used in LDAP SEARCH EXT

Session (Char)	Specifies the session (as returned by LDAP INIT).	
Type (Int)	Integer specifying changes (can be or'd). ADD(Value 1), DELETE (2), MODIFY (4), MODDN(8), ANY(15).	
ChangesOnly (Bool)	If true, the initial search is only used to establish a result set on the server. No results are returned from this initial search.	
RtnEntryChge (Bool)	If true, a entry change notification control is included with each entry. If 0, entry change notification controls are not included with the entries returned from the server.	
IsCritical (Bool)	If true, the control is critical to the search operation. If the server does not support persistent searches, the server will return the error LDAP_UNAVAILABLE_CRITICAL_EXTENSION.	
	If false, the control is not critical to the search operation. Even if the server does not support persistent searches, the search operation is still performed.	
Control (Char)	Returned reference to the control which is created. When you are finished with this control, you must free the reference.	
Returns	See LDAP Error Codes.	
See also LDAP SEARCH EXT		

LDAP DELETE EXT S (Session, DN[, ServerControls, UserControls])

Synchronously deletes the specified entry using LDAP client or server controls.

Session (Char)	Specifies the session (as returned by LDAP INIT).	
DN (Char)	Specifies the distinguished name of the entry to delete.	
ServCtrls (Char)	Reference to the server controls. May be empty if no server controls.	
UserCtrls (Char)	Reference to the user controls. May be empty if no user controls.	
Returns	See LDAP Error Codes.	
See also LDAP ADD EXT S, LDAP MODIFY EXT S		

LDAP FIRST ATTRIBUTE (Session, Reference, BerElement Reference)

This returns the name of the first attribute in an entry.

Session (Char)	Specifies the session (as returned by LDAP INIT).	
Reference (Char)	nce (Char) Reference to the entry whose attributes are being read.	
BerRef (Char)	Reference to the BerElement. Can be used in further LDAP NEXT ATTRIBUTE calls. This reference must be freed by using LDAP FREE.	
Returns	the name of the first attribute in an entry.	
See also LDAP NEXT ATTRIBUTE		

LDAP FIRST ENTRY (Session, Search reference)

This returns the first entry of message type, LDAP_RES_SEARCH_ENTRY from a search result chain.

Session (Char)	Specifies the session (as returned by LDAP INIT).
Reference (Char)	Reference to the result chain as returned by LDAP RESULT or by a synchronous search function.
Returns	character reference to the next entry in the chain or empty if no more entries or failure.

See also LDAP NEXT ENTRY

LDAP FIRST MESSAGE (Session, Reference)

This returns the first message in the result chain.

Session (Char)	Specifies the session (as returned by LDAP INIT).
Reference (Char)	Reference to the result chain as returned by LDAP RESULT or by a synchronous search function.
Returns	a character reference to the first message in the chain, or empty if no more messages or failure. This may be of type LDAP_RES_SEARCH_ENTRY, LDAP_RES_SEARCH_RESULT or LDAP_RES_SEARCH_REFERENCE.

See also LDAP NEXT MESSAGE

LDAP FREE (Reference)

Free a Ber, Control or Search reference. This must be called after the reference is no longer

required.

Reference (Char) The reference to release.

No return

LDAP GET ATT (Collection, Name)

LDAP GET ATT returns the value of the attribute from an attribute collection. Attribute collections are used for the attribute parameters in the LDAP ADD EXT S and LDAP MODIFY EXT S functions.

Collection (Char)	Specifies the collection.
Name (Char)	Specifies the attribute name.
Returns	The attribute's value.

See also LDAP ADD EXT S, LDAP MODIFY EXT S, LDAP SET ATT, LDAP ADD ATT, LDAP GET ATT ARRAY ITEM

LDAP GET ATT ARRAY ITEM (Collection, Name, Index)

LDAP GET ATT ARRAY ITEM returns the value of the nth attribute from an attribute collection. It is possible for a collection to contain more than one value for the same attribute. When this is the case, you use this command to retrieve the individual values of the same attribute. If the index is out of range, an empty value is returned. Attribute collections are used for the attribute parameters in the LDAP ADD EXT S and LDAP MODIFY EXT S functions.

Specifies the collection.
Specifies the name.
Specifies the index (from 1).
The updated collection is returned.

See also LDAP ADD EXT S, LDAP MODIFY EXT S, LDAP SET ATT, LDAP GET ATT, LDAP ADD ATT

LDAP GET DN (Session, Reference)

Obtains the distinguished name of an entry from a search result chain.

Session (Char)	Specifies the session (as returned by LDAP INIT.
Reference (Char)	Reference to the chain as returned by LDAP FIRST ENTRY or LDAP NEXT ENTRY.
Returns	name of the entry, or empty if failure.

See also LDAP FIRST ENTRY, LDAP NEXT ENTRY

LDAP GET OPTION (Session, Option)

LDAP get Option gets the value of the session-wide parameters.

Session (Char)	Specifies the session (as returned from LDAP INIT). This may be empty to get the global defaults.
Option (Char)	Option which may be one of the following:
	LDAP OPT API INFO
	LDAP OPT DESC
	LDAP OPT REFERRALS
	LDAP OPT RESTART
	LDAP OPT PROTOCOL VERSION
	LDAP_OPT_SERVER_CONTROLS
	LDAP_OPT_CLIENT_CONTROLS
	LDAP_OPT_API_FEATURE_INFO
	LDAP_OPT_HOST_NAME
	LDAP_OPT_RESULT_CODE
	LDAP_OPT_ERROR_NUMBER
	LDAP_OPT_ERROR_STRING
	LDAP_OPT_MATCHED_DN
	LDAP_OPT_DEBUG_LEVEL
	LDAP_OPT_TIMEOUT
	LDAP_OPT_REFHOPLIMIT
	LDAP_OPT_NETWORK_TIMEOUT
	LDAP_OPT_URI
	LDAP_OPT_REFERRAL_LIST
	LDAP_OPT_IO_FUNCS
	LDAP_OPT_SESSION_REFCNT
Returns	Character or Integer (depending on the option) specifying the current value.

See also LDAP SET OPTION

LDAP GET VALUES (Session, Entry Reference, Attribute)

Obtains the string value of a specified attribute from an entry.

Session (Char)	Specifies the session (as returned by LDAP INIT).
Reference (Char)	Reference to the message chain as returned by LDAP FIRST ENTRY or LDAP NEXT ENTRY.
Attribute (Char)	The attribute as returned from LDAP FIRST ATTIBUTE, LDAP NEXT ATTRIBUTE or the name of an attribute.
Returns	a comma-separated list. For binary data, use LDAP GET VALUES LEN.

See also LDAP GET VALUES LEN

LDAP GET VALUES LEN (Session, Entry Reference, Attribute)

Obtains the binary value of a specified attribute from an entry.

Session (Char)	Specifies the session (as returned by LDAP INIT).
Reference (Char)	Reference to the message chain as returned by LDAP FIRST ENTRY or LDAP NEXT ENTRY.
Attribute (Char)	The attribute as returned from LDAP FIRST ATTIBUTE, LDAP NEXT ATTRIBUTE or the name of an attribute.
Returns	binary value.
See also LDAP GET VALUES	

LDAP INIT (Host,Port)

LDAP Init opens the specified port on the host and returns a character string indicating the LDAP reference (empty on failure). You must call LDAP USE UTF8 with the appropriate setting prior to calling this command.

Host (Char)	Specifies the host.
Port (Int)	Specifies the port.
Returns	a character reference to the LDAP connection.
See also LDAP USE	UTF8, LDAP AVAILABLE, LDAP UNBIND S

LDAP MODIFY EXT S (Session, DN, Mods, ServerControls, ClientControls)

Synchronously modifies the specified attributes of an entry on an LDAP server, using LDAP client or server controls.

Session (Char)	Specifies the session (as returned by LDAP INIT).	
DN (Char)	Specifies the distinguished name of the entry to modify, for example "cn=kim".	
Mods (Char)	Collection of attributes and values.	
ServCtrls (Char)	Reference to server controls. Specify an empty string if no server controls.	
ClientCtrls (Char)	Reference to client controls. Specify an empty string if no client controls.	
Returns	See LDAP Error Codes.	
See also LDAP ADD EXT S, LDAP DELETE EXT S, LDAP ADD ATT		

LDAP MSGID (Message Reference)

Obtains the ID of the message.

Reference (Char)	Reference to the message.
Returns	The message ID or -1 if failure.

LDAP MSGTYPE (Message Reference)

Obtains the type of message.

Reference (Char)	Reference to the message.
Returns	The message type or -1 if failure.

LDAP NEXT ATTRIBUTE (Session, Reference, BerElement Reference)

This returns the name of the next attribute in an entry.

Session (Char)	Specifies the session (as returned by LDAP INIT).
Reference (Char)	Reference to the entry whose attributes are being read.
BerRef (Char)	Reference to the BerElement. Can be used in further LDAP NEXT ATTRIBUTE calls. This reference must be freed by using LDAP FREE.
Returns	the name of the next attribute in an entry, or empty if no more attributes.

See also LDAP FIRST ATTRIBUTE

LDAP NEXT ENTRY (Session, Reference)

This returns the next entry of message type, LDAP_RES_SEARCH_ENTRY from a search result chain.

Session (Char)	Specifies the session (as returned by LDAP INIT).
Reference (Char)	Reference to the chain as returned by LDAP FIRST ENTRY.
Returns	character reference to the next entry in the chain or empty if no more entries or failure.

See also LDAP FIRST ENTRY

LDAP NEXT MESSAGE (Session, Message Reference)

This returns the next message in the result chain.

Session (Char)	Specifies the session (as returned by LDAP INIT).
Reference (Char)	Reference to the message chain as returned by LDAP FIRST MESSAGE.
Returns	a character reference to the next message in the chain or empty if no more messages or failure. This may be of type LDAP_RES_SEARCH_ENTRY, LDAP_RES_SEARCH_RESULT or LDAP_RES_SEARCH_REFERENCE.

See also LDAP FIRST MESSAGE

LDAP PARSE REFERENCE (Session,Message,Referral,ServerControl,FreeRes)

Extracts URLs and controls from a Message of type LDAP_RES_SEARCH_REFERENCE

Session (Char)	Specifies the session (as returned by LDAP INIT).
Message (Char)	Specifies the message reference.
Referral (Char)	Returned comma-separated string containing alternative LDAP server URLs.
SerControls (Char)	Returned server control references. You must free this reference.
SerControls (Char) FreeRes (Bool)	Returned server control references. You must free this reference. Boolean specifying whether you wish to release the resources. If you specify kFalse then you must free the Message.

LDAP PARSE RESULT (Session,Message,ErrorCode,MatchString,ErrorMsg,Referral,ServerControl, FreeRes)

Session (Char)	Specifies the session (as returned by LDAP INIT).
Message (Char)	Specifies the message reference.
Error code (Int)	Returned error code of last LDAP operation.
MatchString (Char)	Returned character string specifying how much of the name in the request was recognized.
ErrorMsg (Char)	Returned character string of error message associated with error code.
Referral (Char)	Returned comma-separated string containing alternative LDAP server URLs.
SerControls (Char)	Returned server control references. You must free this reference.
FreeRes (Bool)	Boolean specifying whether you wish to release the resources. If

you specify kFalse then you must free the Message.

Returns See LDAP Error Codes.

LDAP RESULT (Session, MsgId, All[, Timeout])

Obtains results from a previous asynchronously initiated operation.

Session (Char)	Specifies the session (as returned by LDAP INIT).
MsgId (Char)	Specifies the message ID returned. Can be LDAP_RES_UNSOLICITED or LDAP_RES_ANY.
All (Char)	Specifies how many messages to be retrieved in a single call to LDAP RESULT. Can be a number or "LDAP_MSG_ONE", "LDAP_MSG_ALL" or "LDAP_MSG_RECEIVED".
Timeout (Int)	Specifies how long (in seconds) to wait for the results to be returned.
Returns	a character reference to the results of the search. If no results are returned this may be 0 (time out) or -1 (error). Free this reference when you are done with it.

See also LDAP COUNT ENTRIES, LDAP COUNT REFERENCES, LDAP COUNT MESSAGES

LDAP SEARCH EXT (Session, Base, Scope [,Filter, Attrs, ServerControls, UserControls, AttrsOnly, Timeout])

Asynchronously searches the directory using LDAP client or server controls.

Session (Char)	Specifies the session (as returned by LDAP INIT).
Base (Char)	Specifies the distinguished name of the entry from which to start the search.
Scope (Char)	Specifies the scope of the search and can be "LDAP_SCOPE_BASE", "LDAP_SCOPE_ONELEVEL" or "LDAP_SCOPE_SUBTREE".
Filter (Char)	Filter string if none is specified then the default filter ("objectclass=*") is used.
ServerControls (Char)Reference to server controls, if any.
UserControls (Char)	Reference to user controls, if any.
Attrs (Char)	Comma-separated list specifies which attributes to return.
AttrsOnly (Char)	Specifies whether to return both attributes & values (default) or only attributes.
Timeout (Int)	Specifies the time out in seconds. Default is 10 seconds.

Returns -1 if failure otherwise the message id of the operation.

See also LDAP SEARCH EXT S

LDAP SEARCH EXT S (Session, Base, Scope [,Filter, Attrs, ServerControls, UserControls, AttrsOnly, Timeout])

Synchronously searches the directory using LDAP client or server controls.

Session (Char)	Specifies the session (as returned by LDAP INIT).
Base (Char)	Specifies the distinguished name of the entry from which to start the search.
Scope (Char)	Specifies the scope of the search and can be "LDAP_SCOPE_BASE", "LDAP_SCOPE_ONELEVEL" or "LDAP_SCOPE_SUBTREE".
Filter (Char)	Filter string if none is specified then the default filter ("objectclass=*") is used.
ServerControls (Char) Reference to server controls, if any.	
UserControls (Char)	Reference to user controls, if any.
Attrs (Char)	Comma-separated list specifies which attributes to return.
AttrsOnly (Bool)	Specifies whether to return both attributes & values (default) or only attributes.
Timeout (Int)	Specifies the time out in seconds. Default is 10 seconds.
Returns	a character reference to the result messages if successful; empty if otherwise.

See also LDAP SEARCH EXT, LDAP COUNT ENTRIES, LDAP COUNT MESSAGES, LDAP COUNT REFERENCES

LDAP SET ATT (Collection, Name, Value)

LDAP SET ATT sets the value of an existing attribute in the attribute collection. Attribute collections are used for the attribute parameters in the LDAP ADD EXT S and LDAP MODIFY EXT S functions.

Collection (Char)	Specifies the collection.
Name (Char)	Name of the existing attribute.
Value (Char)	Specifies the new value.
Returns	The undated collection is returned

See also LDAP ADD EXT S, LDAP MODIFY EXT S, LDAP ADD ATT, LDAP GET ATT, LDAP GET ATT ARRAY ITEM

LDAP SETDEBUG (DebugLevel)

Sets the debug level of the Omnis external. Useful if you need verbose output.

DebugLevel (Int) Specifies the debug level (0 Is off). Debug messages are written to LDAP.LOG file.

No return.

LDAP SET OPTION (Session, Option, Value)

LDAP Set Option sets the value of the session-wide parameters.

Session (Character) Specifies the session (as returned from LDAP INIT). This may be empty to set the global defaults. Option (Character) Option which may be one of the following: LDAP OPT API INFO LDAP OPT DESC LDAP OPT REFERRALS LDAP OPT RESTART LDAP OPT PROTOCOL VERSION LDAP OPT SERVER CONTROLS LDAP OPT CLIENT CONTROLS LDAP OPT API FEATURE INFO LDAP OPT HOST NAME LDAP OPT RESULT CODE LDAP OPT ERROR NUMBER LDAP OPT ERROR STRING LDAP OPT MATCHED DN LDAP OPT DEBUG LEVEL LDAP OPT TIMEOUT LDAP OPT REFHOPLIMIT LDAP OPT NETWORK TIMEOUT LDAP OPT URI LDAP OPT REFERRAL LIST LDAP OPT IO FUNCS LDAP_OPT_SESSION REFCNT Value (Char/Int) The new value. LDAP SUCCESS(0) or -1 on failure. Returns See also LDAP GET OPTION

LDAP SIMPLE BIND S (Session[,LoginDN,Password])

Synchronously authenticates the specified client to the LDAP server using a distinguished

name and password.

Session (Char)	Specifies the session (as returned by LDAP INIT).
LoginDN (Char)	Distinguished name of the entry who is authenticating. For an anonymous authentication, do not specify this parameter.
Password (Char)	Client's password. For anonymous authentication, do not specify this parameter.
Returns	See LDAP Error Codes.
See also LDAP INIT. LDAP UNBIND S	

LDAP UNBIND S (Session)

Unbinds from the directory, closes the connection.

Session (Char)Specifies the session (as returned by LDAP INIT).ReturnsLDAP error codes.See also LDAP INIT, LDAP SIMPLE BIND S

LDAP USE UTF8 (Flag) new for v1.2

Tells the LDAP external to send UTF8 characters to the server and expect UTF8 characters from the server. You should always set this to true prior to connecting to a LDAP version 3 compliant server.

Flag (Boolean)If true, enable UTF8.ReturnsLDAP error codes.

See also LDAP INIT



LDAP Error Codes

LDAP_SUCCESS	0
LDAP_OPERATIONS_ERROR	1
LDAP_PROTOCOL_ERROR	2
LDAP_TIMELIMIT_EXCEEDED	3
LDAP_SIZELIMIT_EXCEEDED	4
LDAP_COMPARE_FALSE	5
LDAP_COMPARE_TRUE	6
LDAP_AUTH_METHOD_NOT_SUPPORTED	7
LDAP_STRONG_AUTH_NOT_SUPPORTED	LDAP_AUTH_METHOD_NOT_SUPPORTED
LDAP_STRONG_AUTH_REQUIRED	8
LDAP_PARTIAL_RESULTS	9
LDAP_REFERRAL	10
LDAP_ADMINLIMIT_EXCEEDED	11
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LDAP_CONFIDENTIALITY_REQUIRED	13
LDAP_SASL_BIND_IN_PROGRESS	14
LDAP_NO_SUCH_ATTRIBUTE	16
LDAP_UNDEFINED_TYPE	17
LDAP_INAPPROPRIATE_MATCHING	18
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