

Integration of Directory Services into XEmacs

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Directory Services



Specialized Database Service



- - u

/etc/passwd, .mailrc, address books (BBDB)



Remote

finger, CSO/PH



Distributed

Lightweight Directory Access Protocol (LDAP)



The CCSO Nameserver

- Developed at the University of Illinois at Urbana Champaign
- Client/Server: qi, ph
- ASCII-based FTP-like Protocol
- Interfaces to sendmail
- In use in more than 340 universities and public organizations
 - Being obsoleted by LDAP



A Sample QI Session

query name=dorner phone=244-1765				
-200:1:	alias:	s-dorner		
-200:1:	name:	dorner steven c.		
-200:1:	email:	dorner@garcon.cso.uiuc.edu		
-200:1:	phone:	(w) 244-1765		
-200:1:	address:	181 DCL, MC 256		
-200:1:	:	1201 W. Washington, C, 61821		
-200:1:	department:	computing services office		
-200:1:	title:	res programmer		
200:Ok.				
query dorner return alias hours				
-200:1:	alias:	m-dorner		
-508:1:	hours:	Not present in entry.		
query alias=s-dorner return id				
-503:1:	id:	You may not view this field.		
200:Ok.				
query name=dorner address=moon				
501:No mat	ches to your	query.		

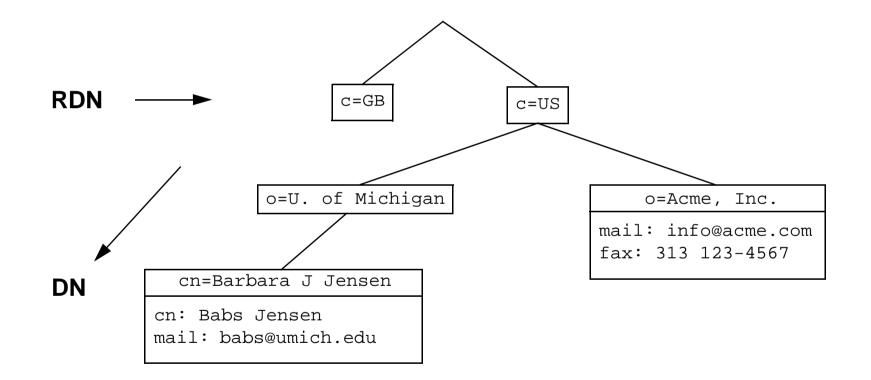


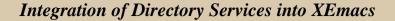
Lightweight Directory Access Protocol (LDAP)

- Based on the ISO X.500 directory model: hierarchical, distributed
- Binary protocol on top of TCP: BER of ASN.1
- Internet standard: RFC 1779 (v2) and 2251 (v3)
 - Strong support from software vendors: Netscape, Microsoft
 - Free software implementation available: OpenLDAP
- **Public servers: Four11, BigFoot**



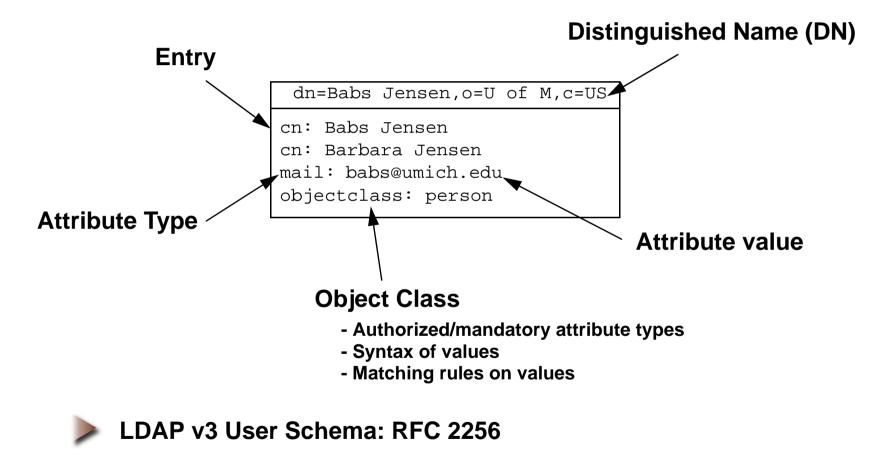
The LDAP Directory Information Tree (DIT)













Integration of CSO/PH into Emacs



ph.el: XEmacs 20.3, GNU Emacs 20.1



- Limited to the client functionality (query)



No authentication



Obsoleted by EUDC



Integration of LDAP into Emacs (1)

Using an external process



Idap.el, runs on XEmacs 19.15, GNU Emacs 19.34



Does not add code to the Emacs executable



Pure e-lisp implementation



Less efficient

Less reliable parsing of search results



Integration of LDAP into Emacs (2)

Using internal code linking to external LDAP libraries



Available in XEmacs 21.0





Multiple operations on the same connection



No need for external utilities, more flexible



Access to binary values



More difficult to code



Integration of LDAP into Emacs (3)

Using an XEmacs dynamic shared object library

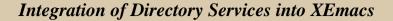




All the advantages of the internal implementation



Advantages of DSO libs





The XEmacs LDAP API



High-level interface: similar to LDAP command-line tools

(ldap-search FILTER & optional HOST ATTRIBUTES ATTRSONLY)



Low-level interface: closer to the C API

Currently limited to the (synchronous) search API



Unified Access to Directory Services

Objectives

- Provide the same user interface to all the directory services
- Expose directory servers as a single server

Problems

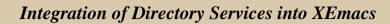
- Variety of protocols (local, client/server)
- Variety of query APIs
- Differences in naming



Emacs Unified Directory Client

Features at a glance:

- Three query interfaces: form-based, minibuffer and inline
- Custom/widget-based user interface
- Supports 3 back-ends for queries: CSO/PH, LDAP, BBDB
- Hotlist of directory servers
- Multi-server queries (inline mode only)
- BBDB record creation based on query results





The Form-based Query Interface

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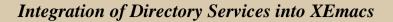
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First Name:	
E-Mail:	
Phone:	
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Handling Multiple Servers

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;; then enter the text		IVI - :	er.	,	
-	Shell Command on Region	\$v3 [
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	Debug (DBX)		-		
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			Expand milline Query	♦ Ispsun17.epfl.ch:9009 (Idap)	
			Get Email	\diamond cso.epfl.ch (ph)	
			Get Phone	\bigcirc Idap.four11.com (Idap)	
			List Valid Attribute Names	♦ Idap.bigfoot.com (Idap)	
			Customize	♦ ns.eurecom.fr (ldap)	
				Bookmark Current Server	
				Edit Server List	
				New Server	
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Multi-server Inline Queries



Uses (some of) the servers in the hotlist



Can perform multiple attempts on the same server



The Inside View

Define an extensible minimum common working set

Common attributes

name firstname email phone

Simple query function with server defined matching rules

Attribute conversion rules for BBDB (optional)

Architecture : single front-end / multiple back-ends

- Each back-end has its own implementation file: eudc-backend.el
 - Each back-end must implement the minimum working set



Interfacing to the Front-end

Protocol-local, Server-local variable bindings

(eudc-protocol-set	<pre>'eudc-query-function 'eudc-ldap-simple-query-internal 'ldap)</pre>
(eudc-protocol-set	<pre>'eudc-protocol-attributes-translation-alist 'eudc-ldap-attributes-translation-alist 'ldap)</pre>
(eudc-protocol-set	'eudc-bbdb-conversion-alist 'eudc-ldap-bbdb-conversion-alist
(eudc-protocol-set	'ldap) 'eudc-protocol-has-default-query-attributes nil 'ldap)

Registering

(eudc-register-protocol 'ldap)



Future work

XEmacs LDAP interface

Internationalization: UTF-8 encoding and decoding of string values

Support for binary values (JPEG photos, audio samples)

- Implement the add, modify and delete APIs
- Rewrite as a DSO module
- Handle LDAP v3 referrals

EUDC

- Internationalization: UTF-8 encoding and decoding of string values
- Support for binary values (JPEG photos, audio samples)