

```
id-hook 'LaTeX-mode-hook
```

```
(lambda ()  
  (si: :key LaTeX-mode-map  
    [(C-c C-c) . (lambda ()  
                  (au: fill-r  
                    (append '(("\\.phtmls" . html-mode)  
                              ("\\.ehtmls" . html-mode))
```

XEmacs

Integration of Directory Services into XEmacs

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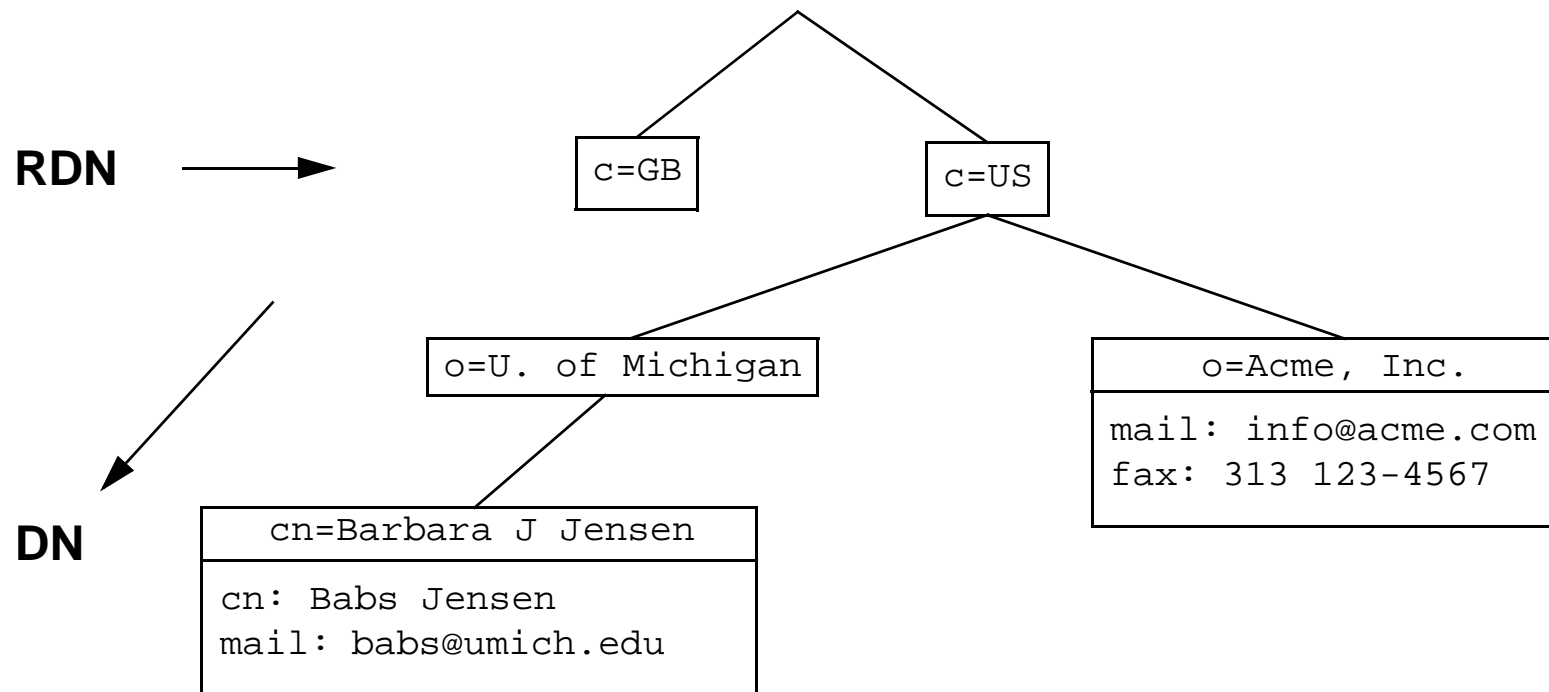
Directory Services

- ▶ **Specialized Database Service**
- ▶ **Local**
/etc/passwd, .mailrc, address books (BBDB)
- ▶ **Remote**
finger, CSO/PH
- ▶ **Distributed**
Lightweight Directory Access Protocol (LDAP)

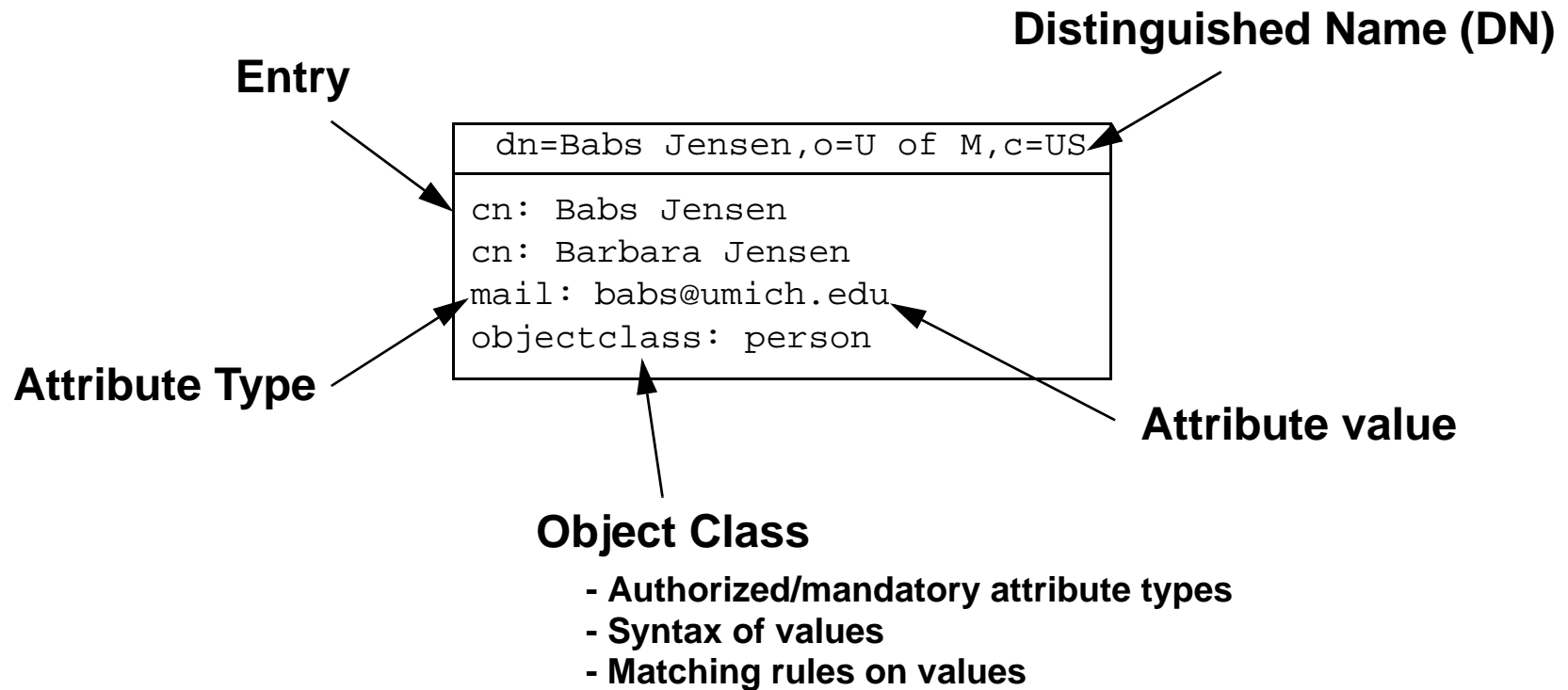
Lightweight Directory Access Protocol (LDAP)

- ▶ **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)



LDAP Schemas



▶ LDAP v3 User Schema: RFC 2256

Integration of CSO/PH into Emacs

- ▶ **ph.el: XEmacs 20.3, GNU Emacs 20.1**
- ▲ **Pure e-lisp implementation**
- ▼ **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
- ▲ No process spawning
- ▲ 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

- ▶ (Hopefully !) available in XEmacs 21.2
- ▶ All the advantages of the internal implementation
- ▶ Advantages of DSO libs

The XEmacs LDAP API

Two-level API

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

```
(ldap-search FILTER &optional HOST ATTRIBUTES ATTRONLY)
```

- ▶ **Low-level interface: closer to the C API**

```
(ldap-open HOST &optional PLIST)
```

```
(ldap-close LDAP)
```

```
(ldap-search-internal LDAP FILTER &optional BASE SCOPE  
ATTRS ATTRONLY)
```

- ▼ **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

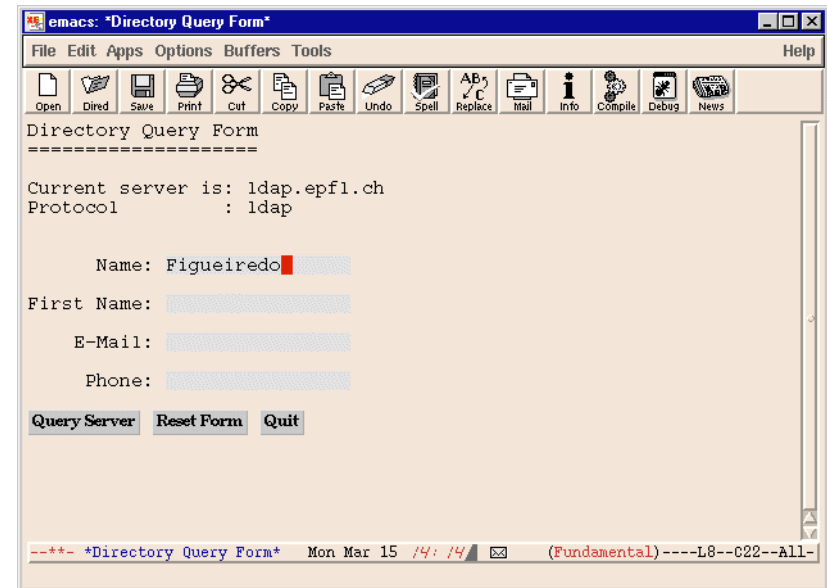
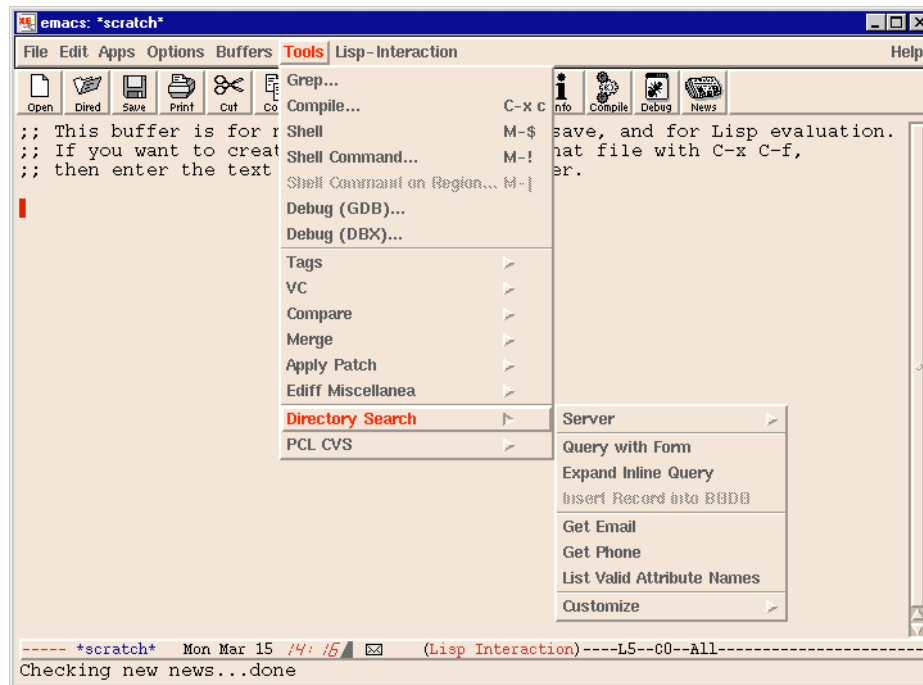
- ▶ Variety of protocols (local, client/server)
- ▶ Variety of query APIs
- ▶ Differences in naming

Emacs Unified Directory Client

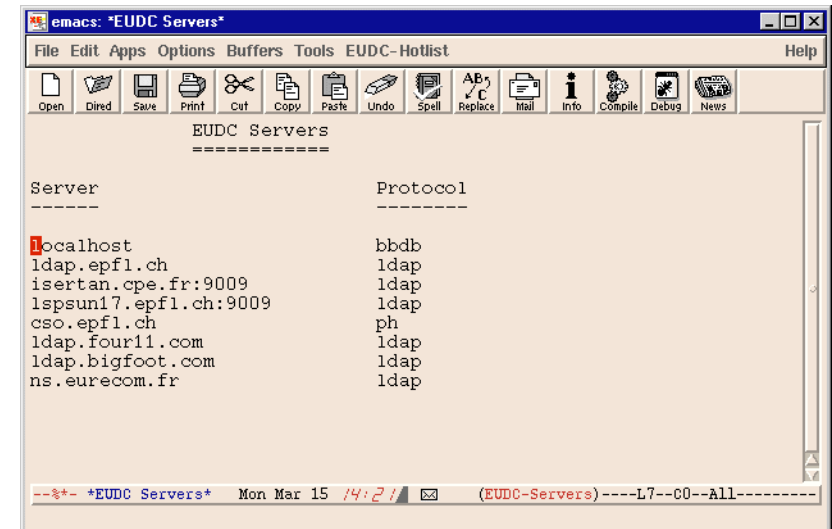
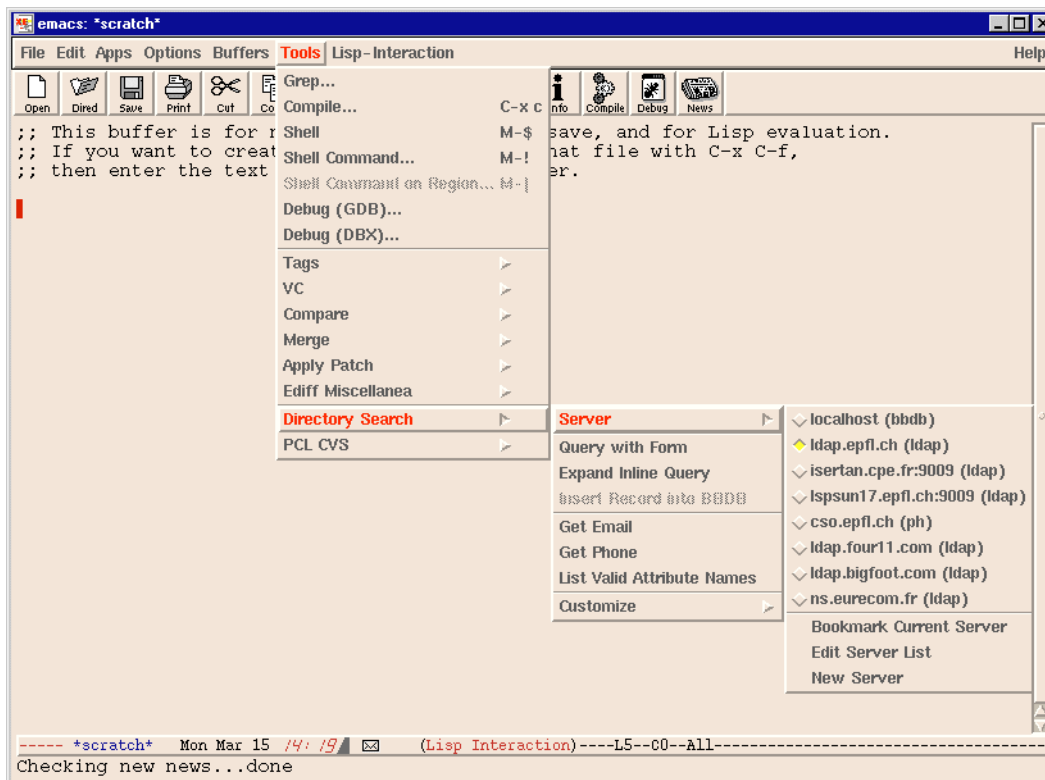
Features at a glance:

- ▶ **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



Handling Multiple Servers



Multi-server Inline Queries

- ▶ **Used for e-mail address completion**
- ▶ **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 'eudc-query-function  
                  'eudc-ldap-simple-query-internal  
                  'ldap)  
(eudc-protocol-set 'eudc-protocol-attributes-translation-alist  
                  'eudc-ldap-attributes-translation-alist  
                  'ldap)  
(eudc-protocol-set 'eudc-bbdb-conversion-alist  
                  'eudc-ldap-bbdb-conversion-alist  
                  'ldap)  
(eudc-protocol-set '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)