Introduction to LDAP: "The New Black"

With Two-Factor Authentication by Entrust

WPLUG Tutorial / Presentation
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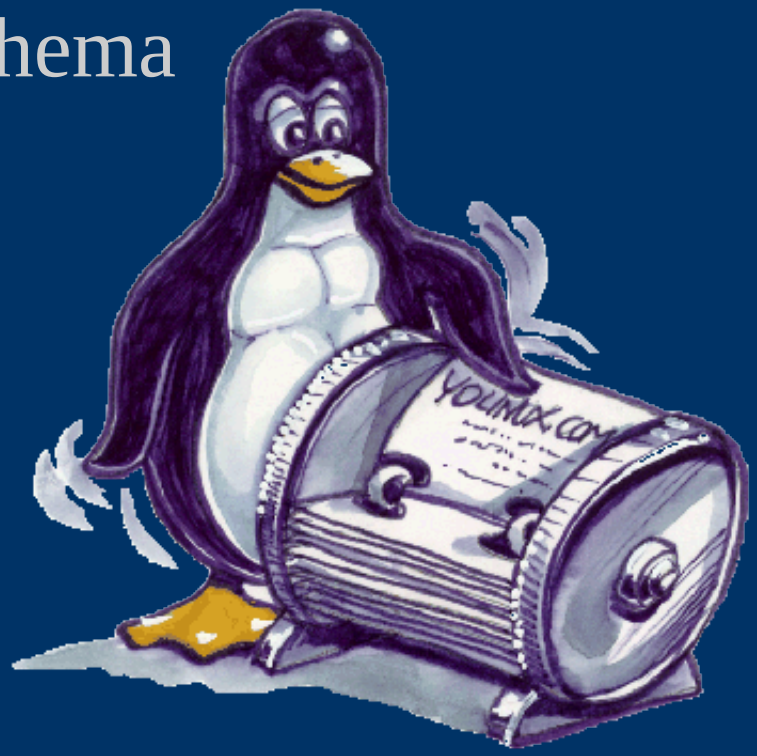
What is LDAP?

- LDAP = Lightweight Directory Access Protocol
- RFC2251, etc..
- What is a directory?
- A database with a quantified schema

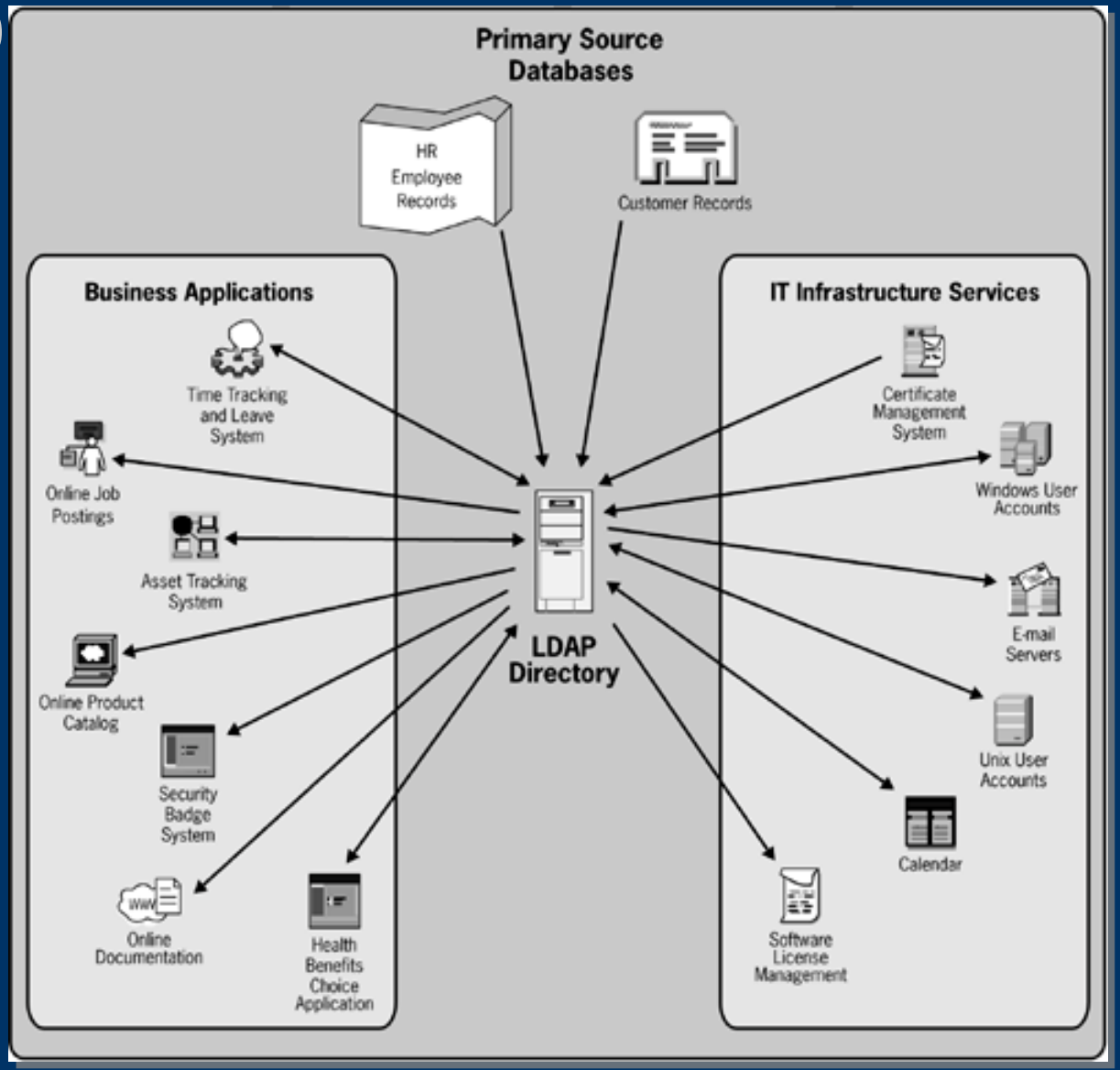


All the runway models in London are doing it...

Don't you want to do runways?

What can the directory store?

- Identity information (Employees, Users, Clients)
-
- Application / System Groups / Role Membership
-
- Systems / Servers / Devices
-
- Departmental / Organization
-
- Facilities
-
- Telephony / GIS

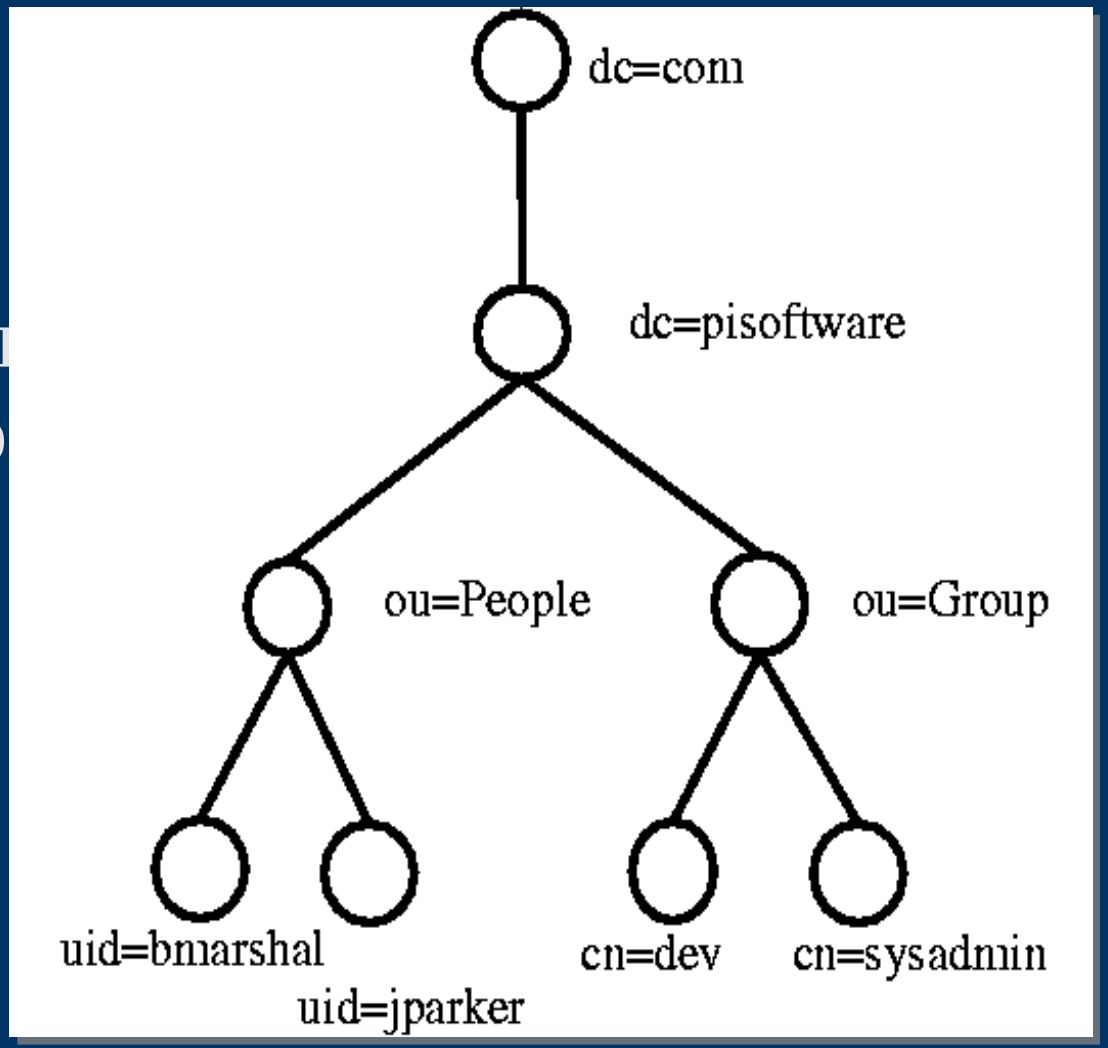


What does all of that mean? What problems can it solve?

- Centralized identity storage
- Application-neutral format
- Widely supported
- Easily integrates
- Think: Active Directory

The LDAP Directory Layout

- Data is stored in a hierarchy
- Facilities to let you model your LDAP tree after the departmental or geographical structure of your organization
- More details later

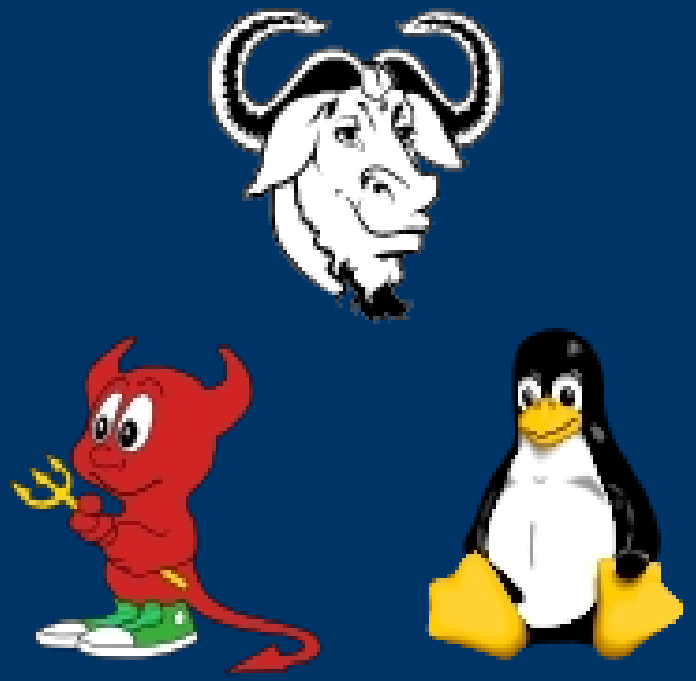


LDAP By Itself = Useless

- POSIX Systems for Centralized User Management: NSS + PAM
- Databases and Applications for Role Population
- E-Mail Systems for simplified database
- MUA Address Book population
- RADIUS (VPN/Wireless/802.1x)
- VOIP/SIP/H.232 Directories
- Integrate/Align with PKI (RFC2559)

When to Use LDAP ?

- When you have more than one user
- And you have at least two systems
- Any heterogeneous environment



When to quit drinking?

OpenLDAP

- Development status: Mature
- Organizational Model: Dictatorial / Totalitarian
- Dual-head release engineering cycle
- Highly portable
- Modular: Servers, Client, Libraries, Dev
- Legacy support for Krb/SASL
- Uses BDB Backend
- Strong man pages
- FAQ-o-Matic / vim-style web site
- License: Custom BSD-Style
- Responsible Security Posture

OpenLDAP Pose

Prove it!

- Fedora
- $ sudo yum install openldap-{client,server,devel}
- $ sudo vim /etc/openldap/slapd.conf && sudo \
  mkdir /var/db/openldap-data
- $ sudo chkconfig –level 345 ldap on && sudo \
  service ldap restart

More about the Daemon

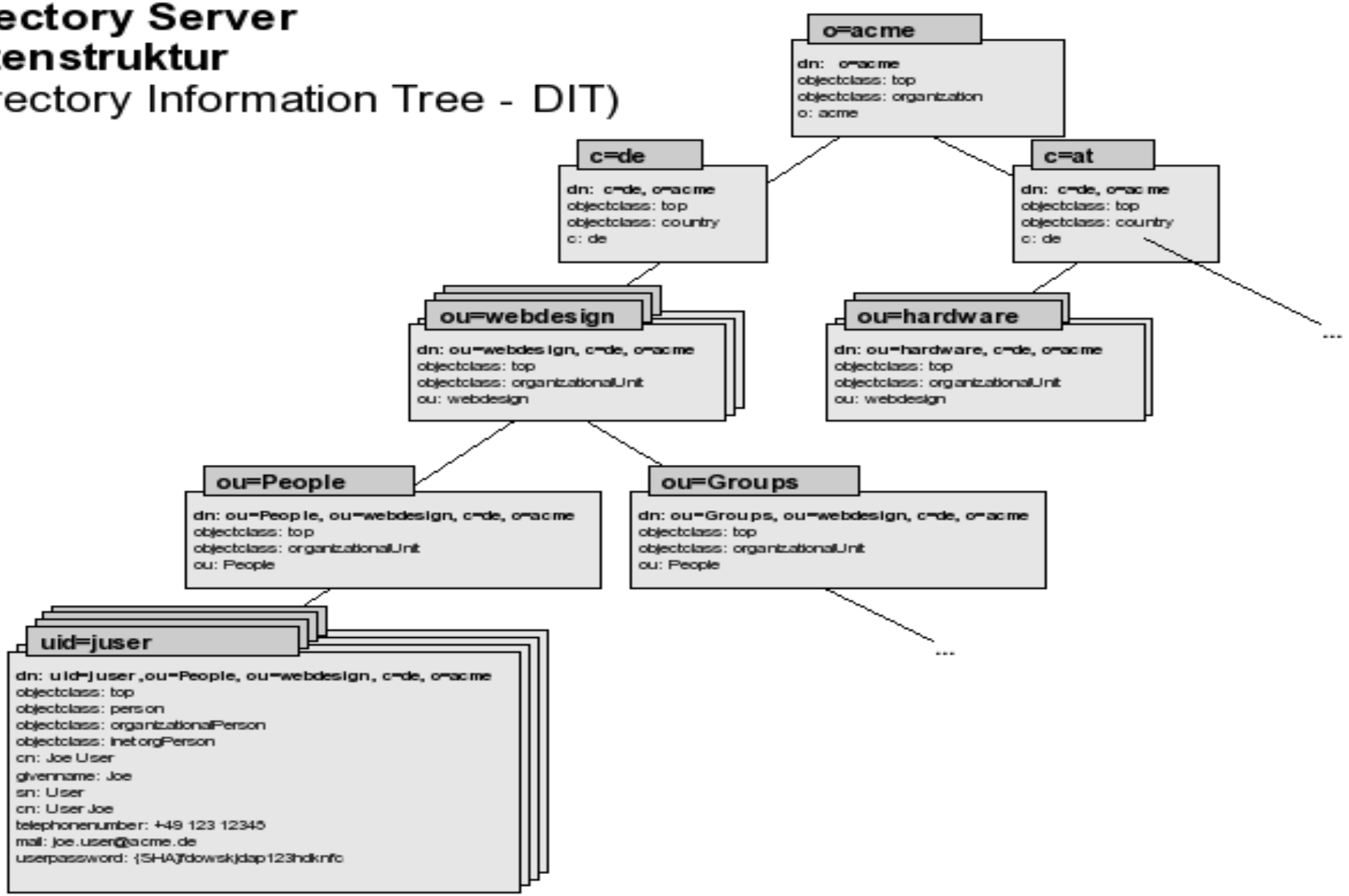
- slapd(8) daemon - TCP listener (SSL/TLS)
- Two implied nodes: The root, the admin
- Rest of data is stored in a BDB backend
- Listens on TCP sockets

The LDAP Tree (Important Concepts)

- Each node on the tree is accessible by a X.500 name
- The prefix is defined by the root in the config:
- - e.g., dc=wplug, dc=org
- Dc = Domain Control
- O = Organization
- Ou = Organizational Unit
- ex.: “dn: ou=People, dc=wplug,dc=org”
- A “DN” (Distinguished Name) is any point on the LDAP tree referenced by its unique X.500 Path
- Syntax in examples, documents is ambiguous

LDAP Tree Reference Slide

Directory Server Datenstruktur
(Directory Information Tree - DIT)



More about DNs

- A DN object is a collection of Attribute + Value pairs
- The valid Attributes in a DN are defined/constrained by the Special Attribute +Value found in each DN known as the objectClass
- Some Attributes can be multi-row arrays
- Some Attributes are required/compelled by the objectClass per the Schema
-

OpenLDAP Interaction / Bindings

- Perl
- PHP
- C
- CLI
- Python

LDAP CLI Utilities

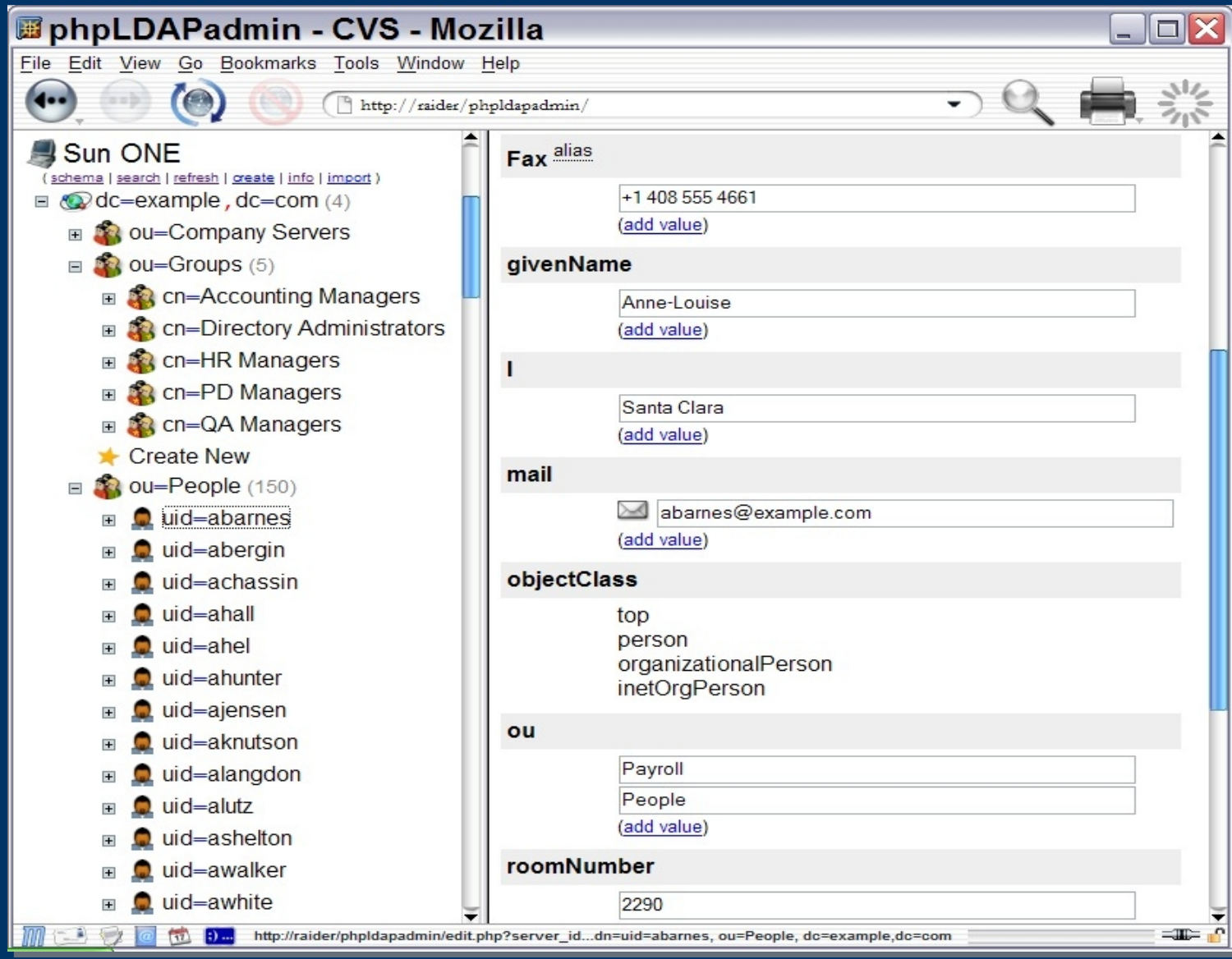
- slapd.conf(5), slapd.access(5), slapacl(8), slapadd(8), slapauth(8), slapcat(8), slapdn(8), slapindex(8), slappasswd(8), slaptest(8), slurpd(8), slapcat(8), ldapadd(1), ldapdelete(1), ldapmodrdn(1), ldapsearch(1)
-
- LDAP Bind Syntax Overview
- Search syntax is LISP-like

Initial Population using slapadd(1)

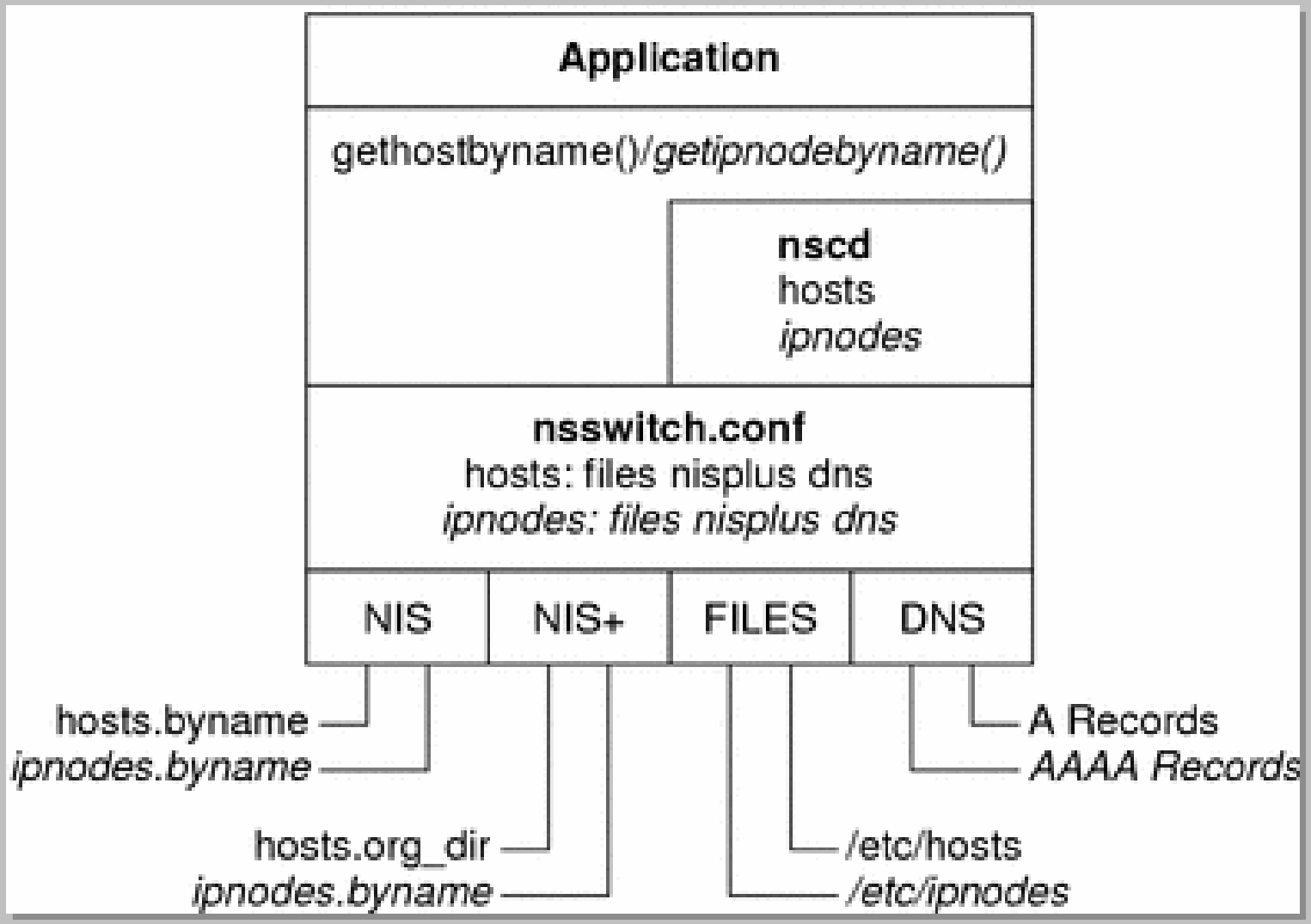
- $ slapadd
-
- Common command syntax notes
-
- Example LDIF
-
- Last that you'll see of LDIF

Install PHPLDAPAdmin

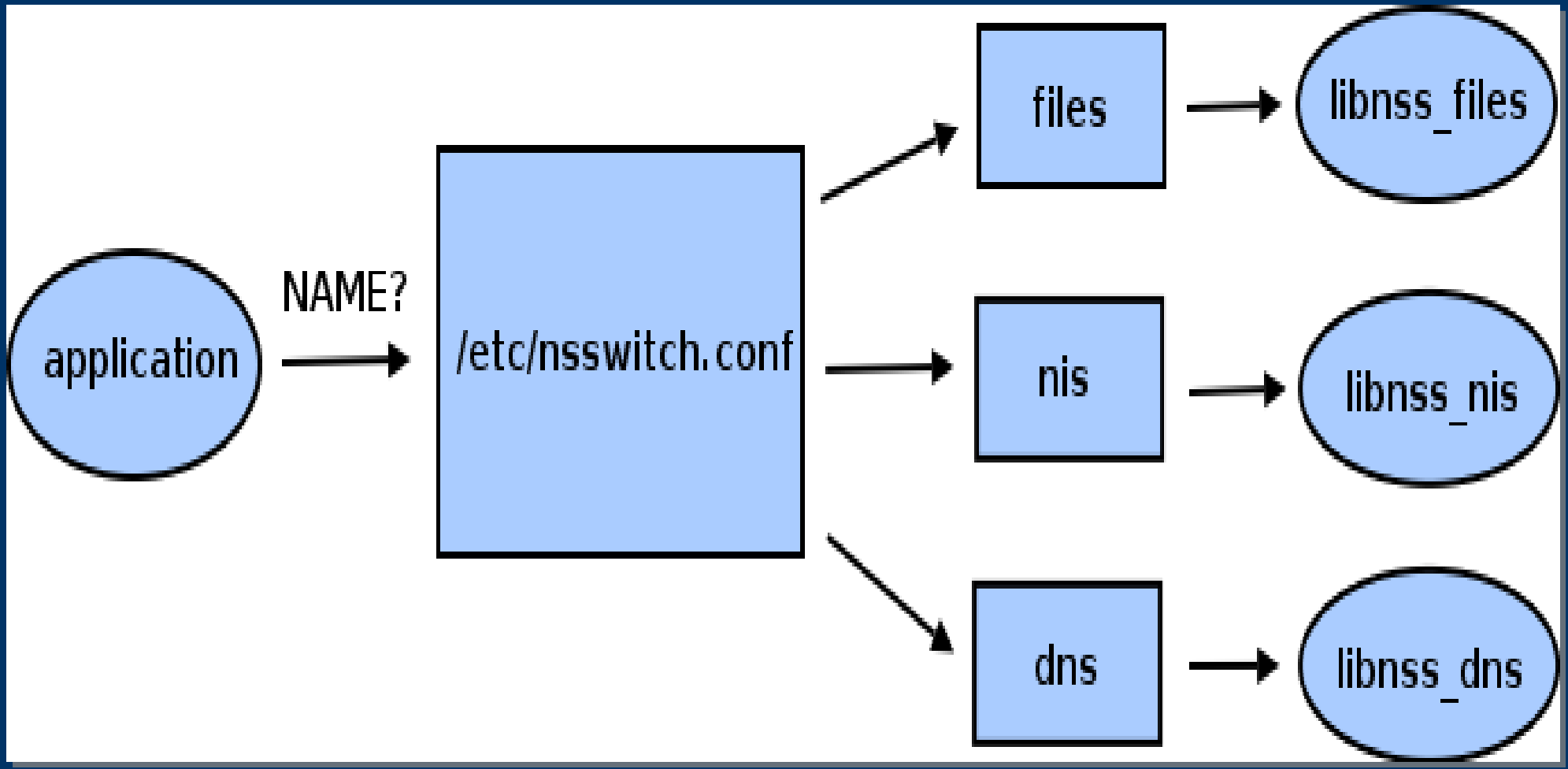
- Screen-shot
- Localhost



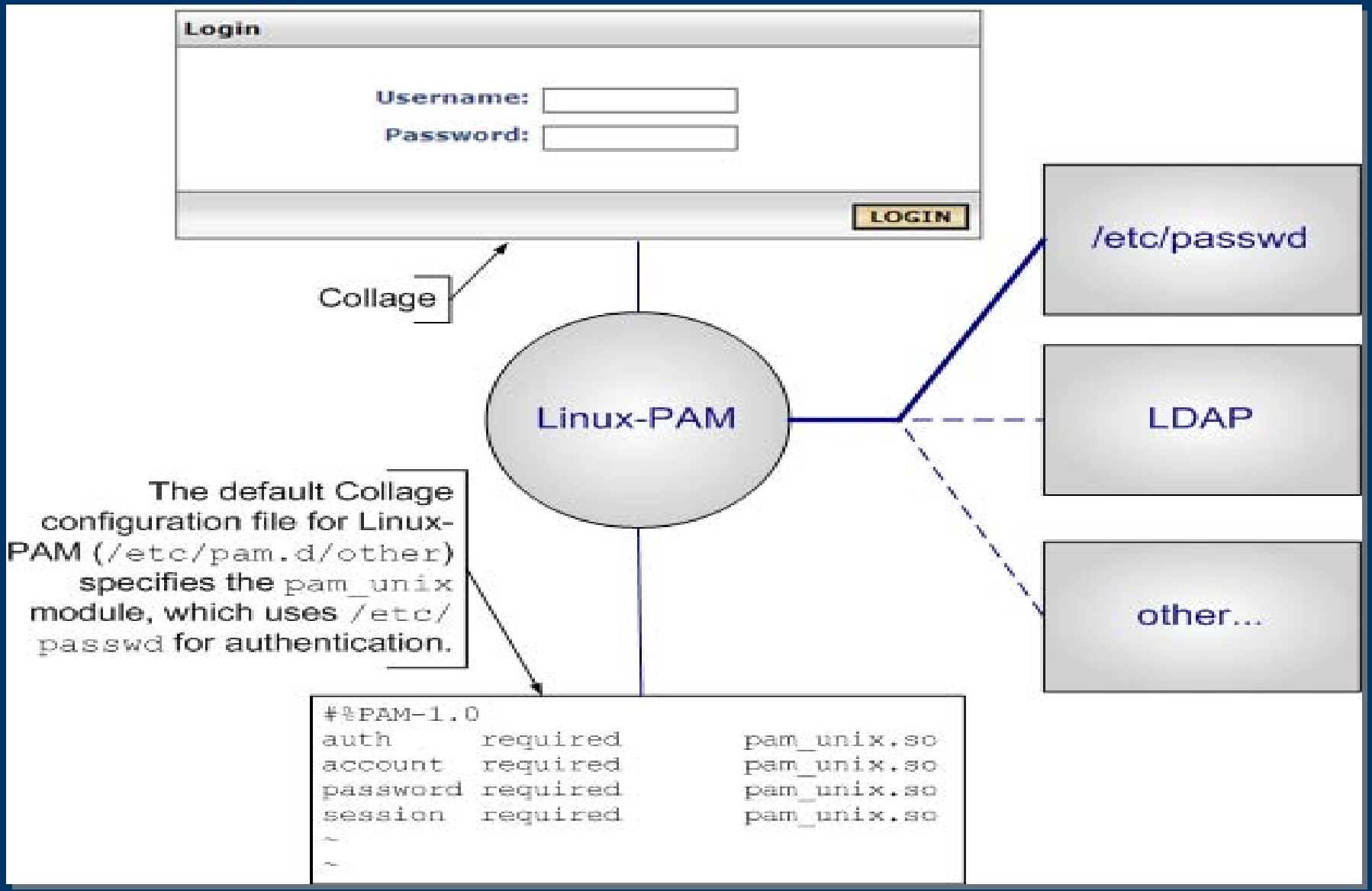
NSS + PAM – libC calls



NSS/PAM API


application
NAME?
/etc/nsswitch.conf
files
nis
dns
libnss_files
libnss_nis
libnss_dns

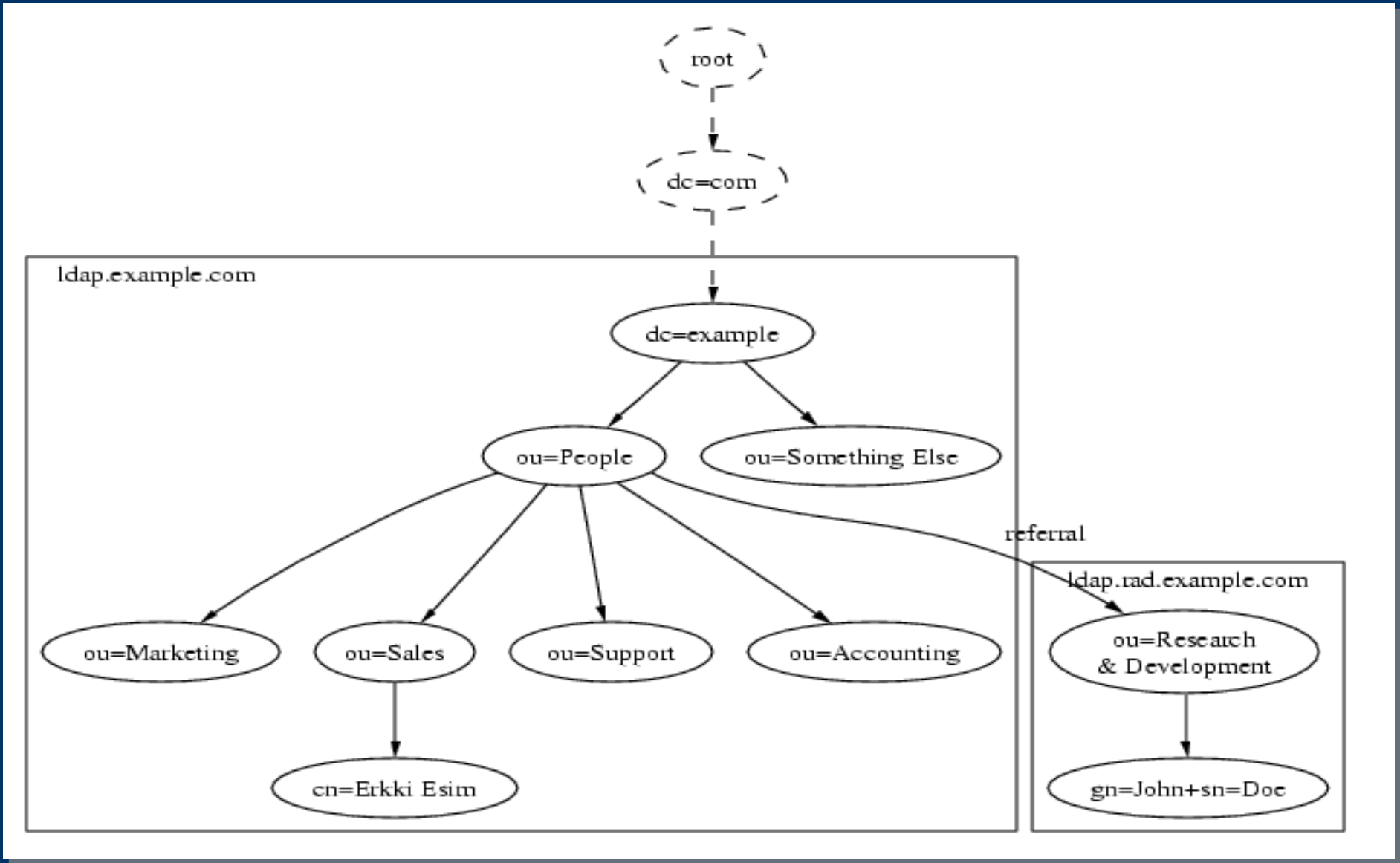
PAM_LDAP


Login
Username:
Password:
LOGIN
Collage
Linux-PAM
/etc/passwd
LDAP
other...
The default Collage configuration file for Linux-PAM (/etc/pam.d/other) specifies the pam_unix module, which uses /etc/passwd for authentication.
#%PAM-1.0
auth required pam_unix.so
account required pam_unix.so
password required pam_unix.so
session required pam_unix.so
~
~

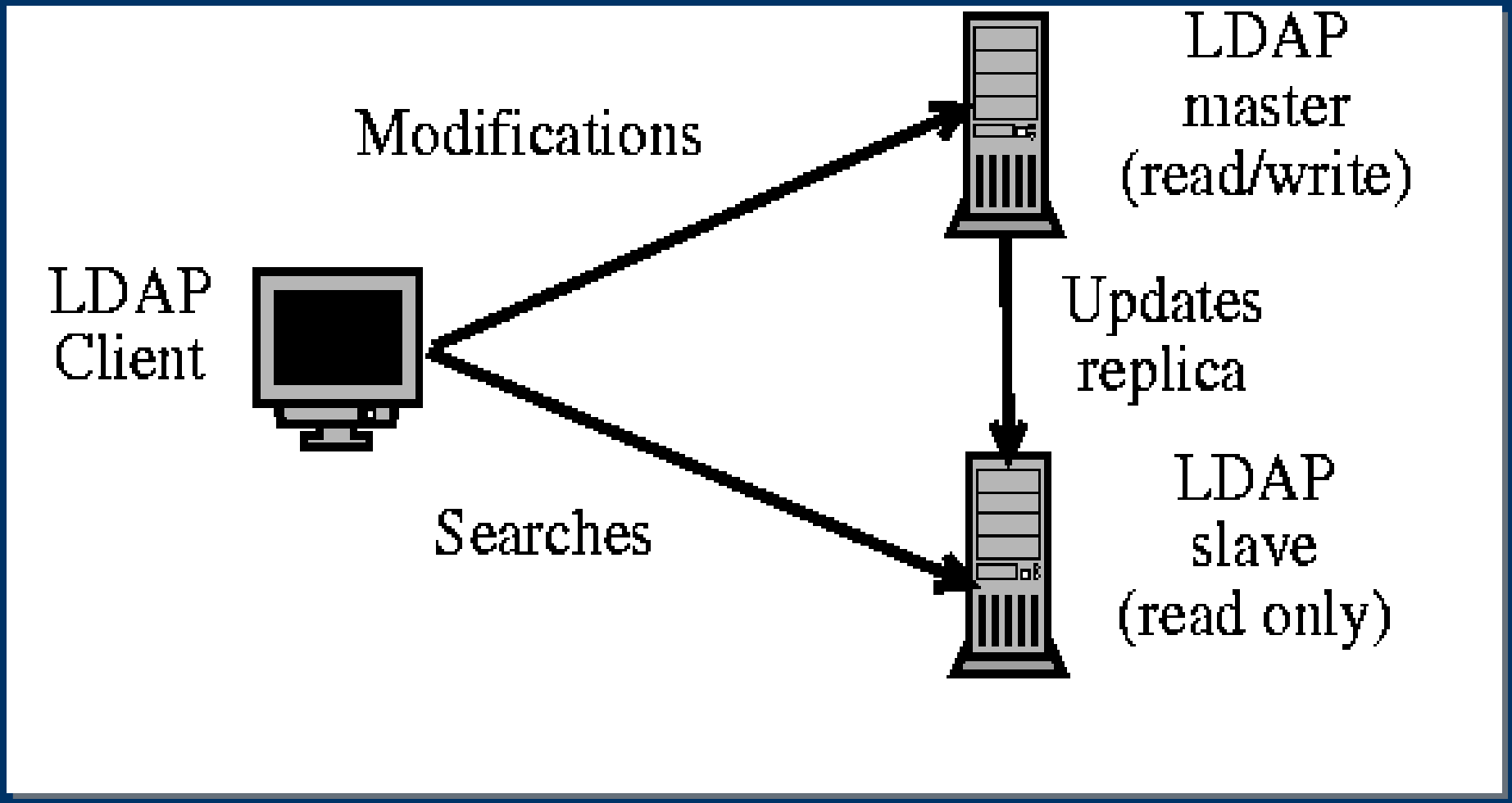
How Groups and Attributes are Used

- PAM/NSS
- Apache
- LDAPAuthentication
- Mediawiki
- FreeRADIUS
- Entrust

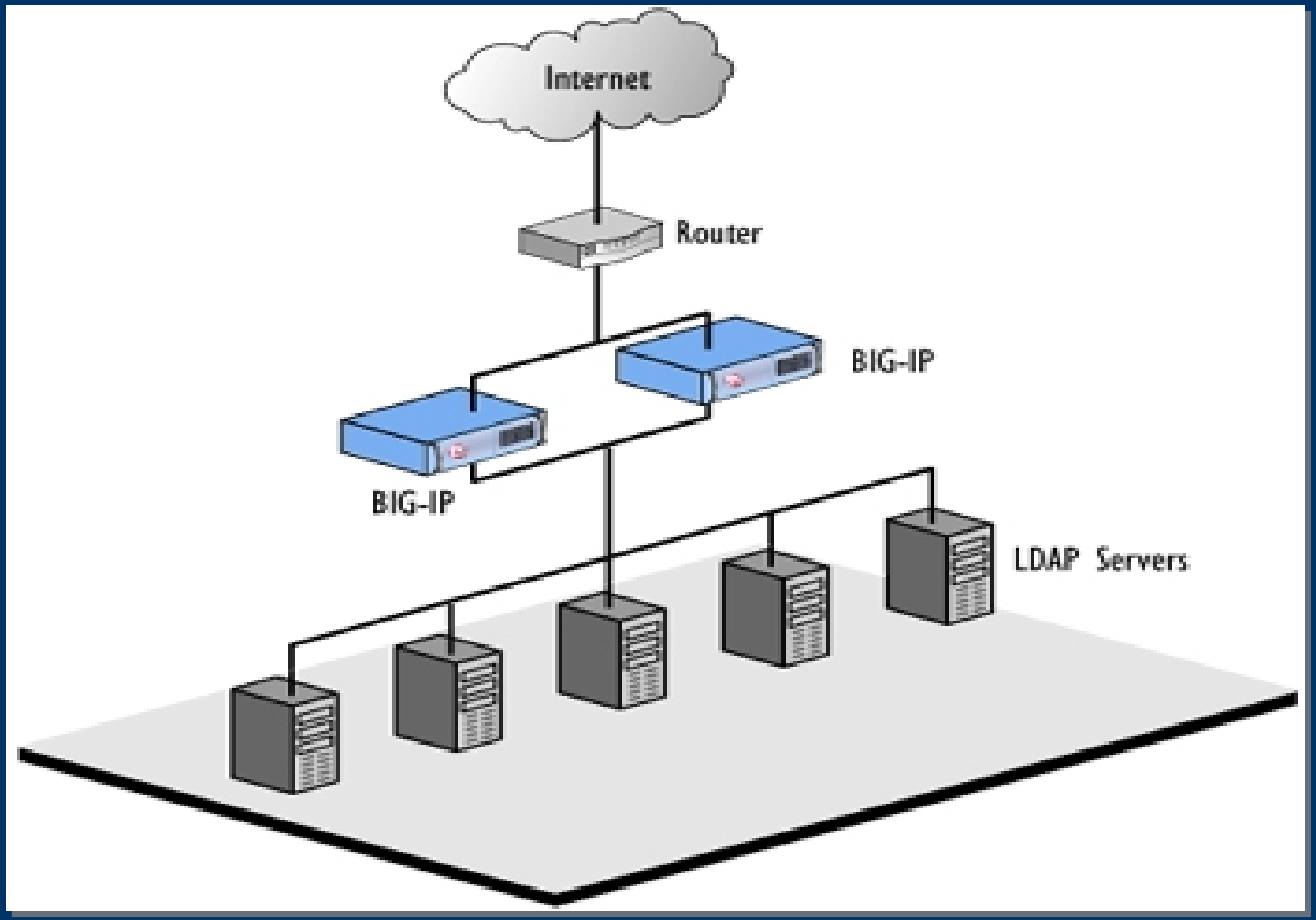
Other: Referrals



Replication



HA with Referrals and Replication



Other: Add a schema

- slapd.conf(5)
  - Add RADIUS

Where do we go from here?

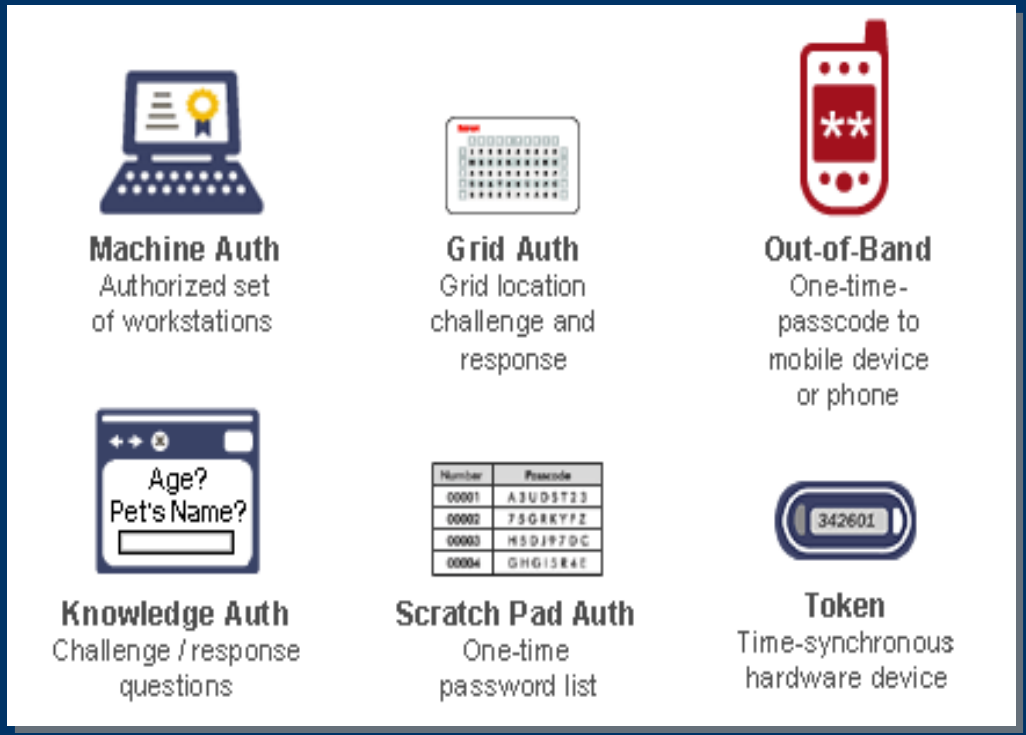
- Lurk the mailing lists
- Install it yourself
- Intermission
- Pizza

Introducing Entrust IdentityGuard

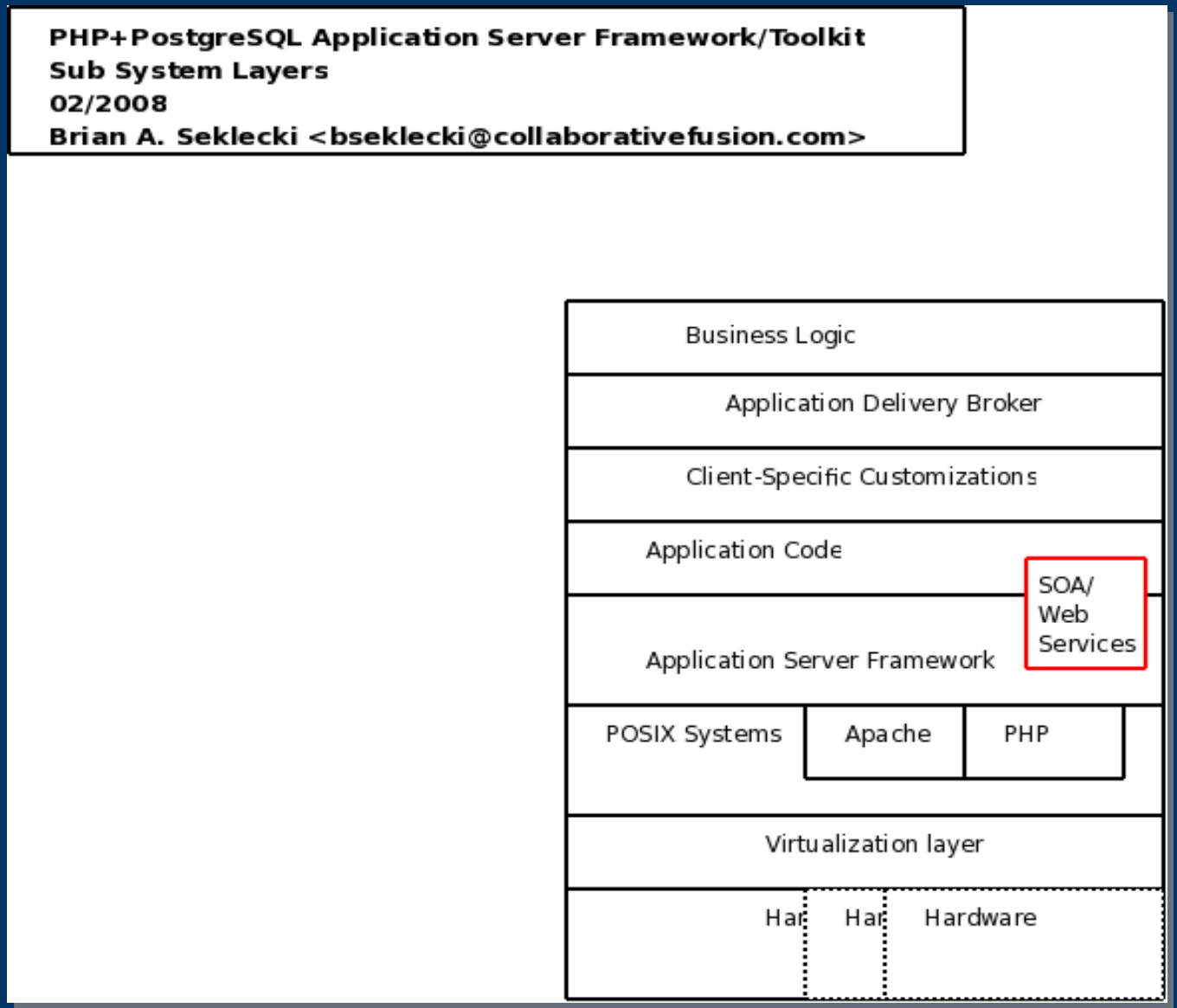
- Two Factor Authentication
- Identity Management
- Linux/POSIX Platform
- Tomcat/Jakarta Platform
- RADIUS (PAM, Dot1x)
- SOAP-XML

Types of Authentication

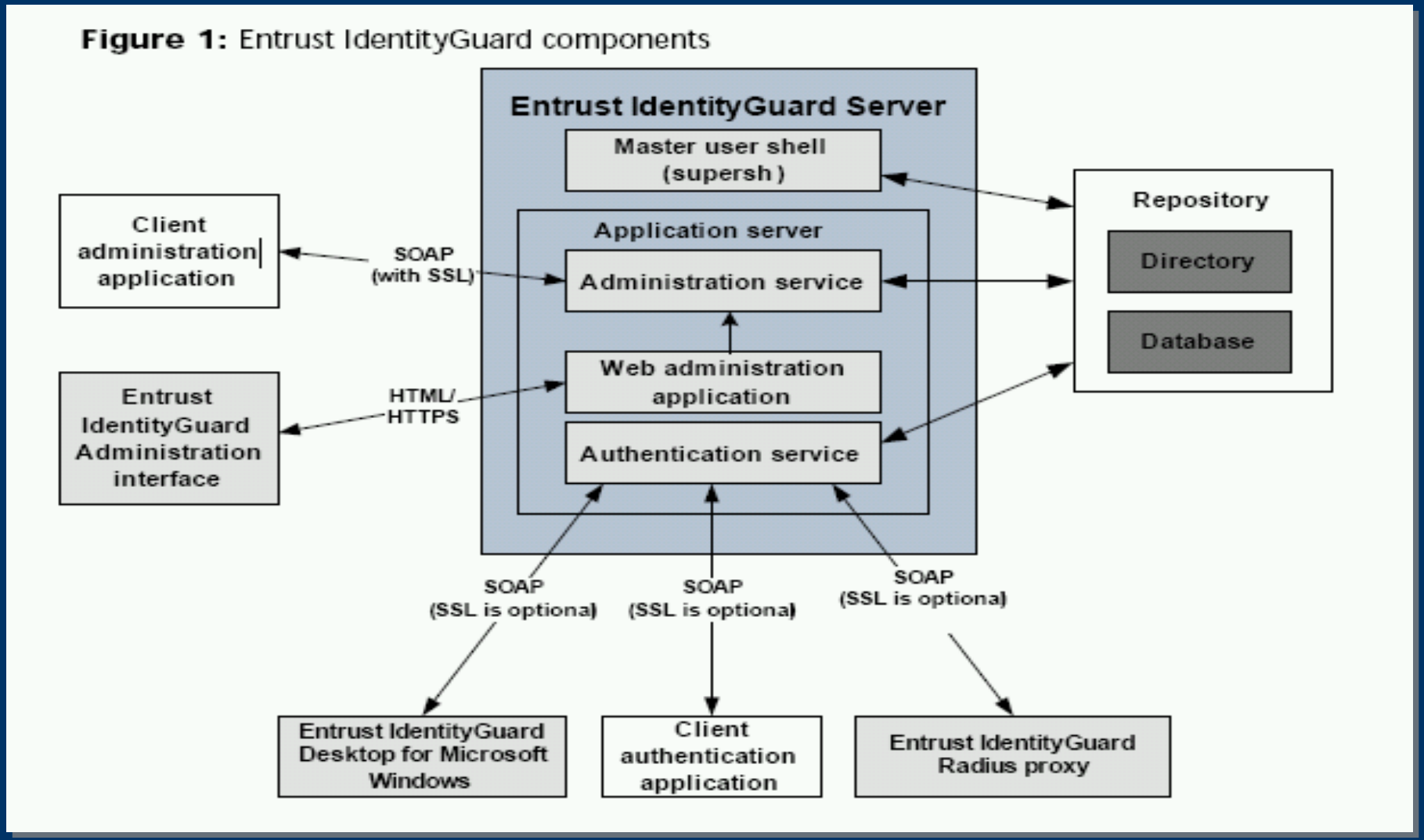
- Tokens
- Grids
- OTP Lists
- Out-of-Band
- Knowledge-Tokens
- Machine Authentication



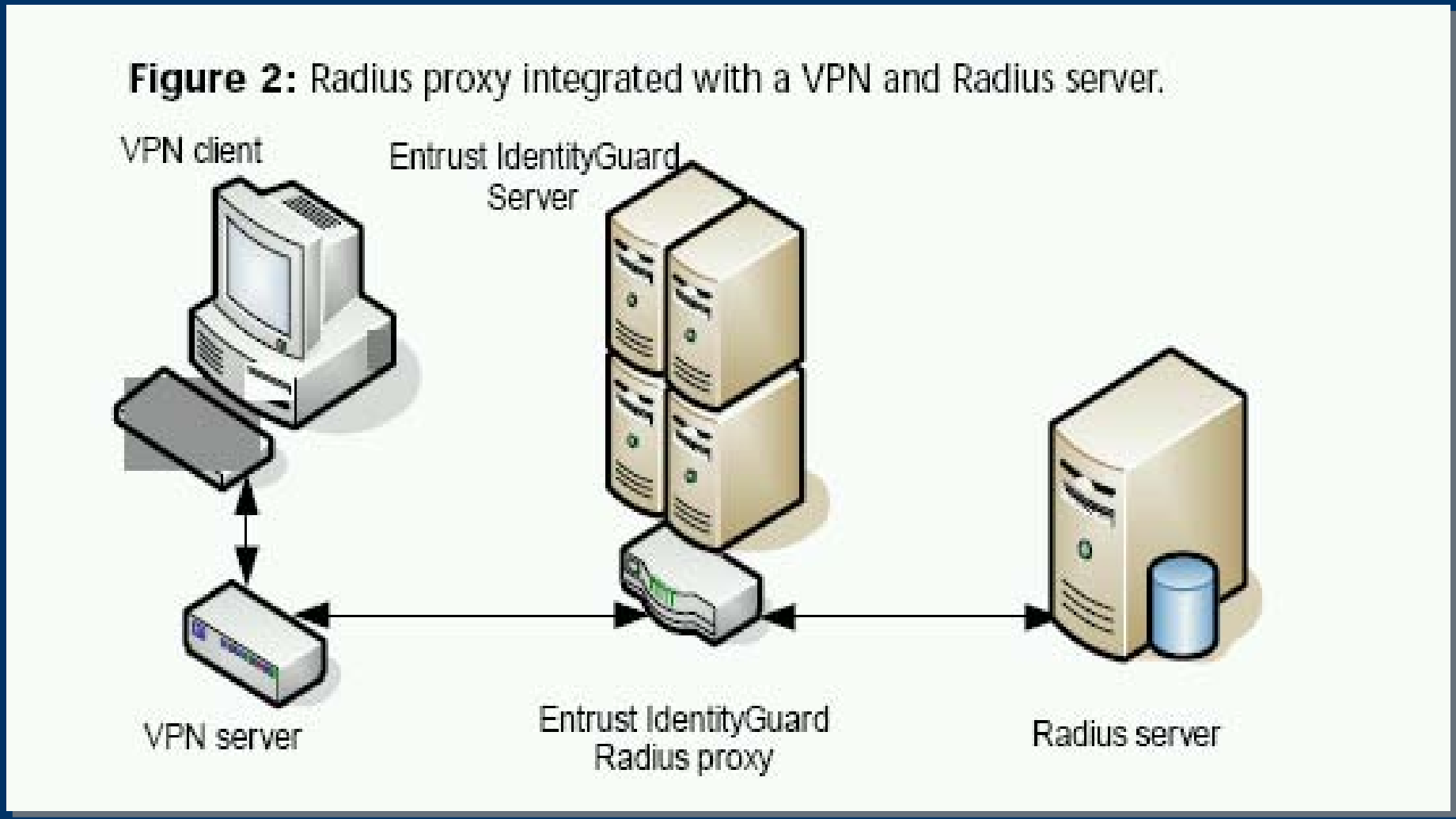
Application Framework Model



Logical Component Overview



RADIUS Proxy



JSP Web Interface

- Localhost Presenation