OpenLDAP

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1 Introduction to LDAP

2 OpenLDAP

3 Other free software LDAP implementations

Introduction to LDAP

What is LDAP?

LDAP or Lightweight Directory Access Protocol is a standards-based protocol for accessing and maintaining distributed directory information services. LDAP has always been considered a standard for user management in organizations of all sizes.

What is directory service?

- Directory is a specialized database specifically designed for searching and browsing, in additional to supporting basic lookup and update functions.
- Directories tend to contain descriptive, attribute-based information and support filtering capabilities.
- Directories generally do not support complicated transaction or roll-back schemes found in database management systems designed for handling high-volume complex updates.
- Directories are generally tuned to give quick response to high-volume lookup or search operations.

What kind of information can be stored in the directory?

LDAP information model is based on entries. An entry is a collection of attributes that has a globally-unique Distinguished Name (DN). The DN is used to refer to the entry unambiguously. Each of the entry's attributes has a type and one or more values.

How is the information arranged?

Directory entries are arranged in a hierarchical tree-like structure.

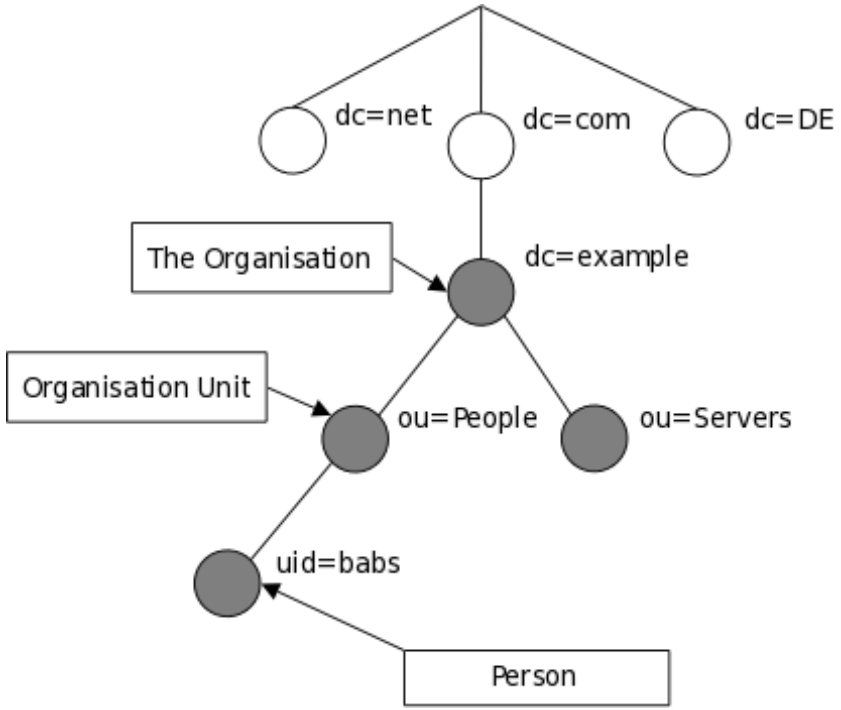


Figure 1: LDAP Tree

Differences between traditional databases

- LDAP is a open standard protocol.
- LDAP is heavily read optimized.
- LDAP is lightweight.

Usecases

Some of the usecases of LDAP are:

- Machine Authentication
- User Authentication
- User/System Groups
- Address book
- Organization Representation
- Asset Tracking
- Telephony Information Store
- User resource management
- E-mail address lookups
- Application Configuration store Machine Authentication
- etc

OpenLDAP

What is OpenLDAP?

- OpenLDAP is an free and open source implementation of LDAP. The project started at University of Michigan, now maintained by the OpenLDAP Foundation.

Features

- Lightweight
- Supports a wide variety of backends or databases.
- Supports components called overlays which can be used to customize backend behaviour without the need to write a custom backend.
- Has support for wide variety of OS and services.
- OpenLDAP is highly flexible. Has code-reliant functionality which doesn't lock users into predetermined workflows; rather, we can manipulate the software to our exact needs.

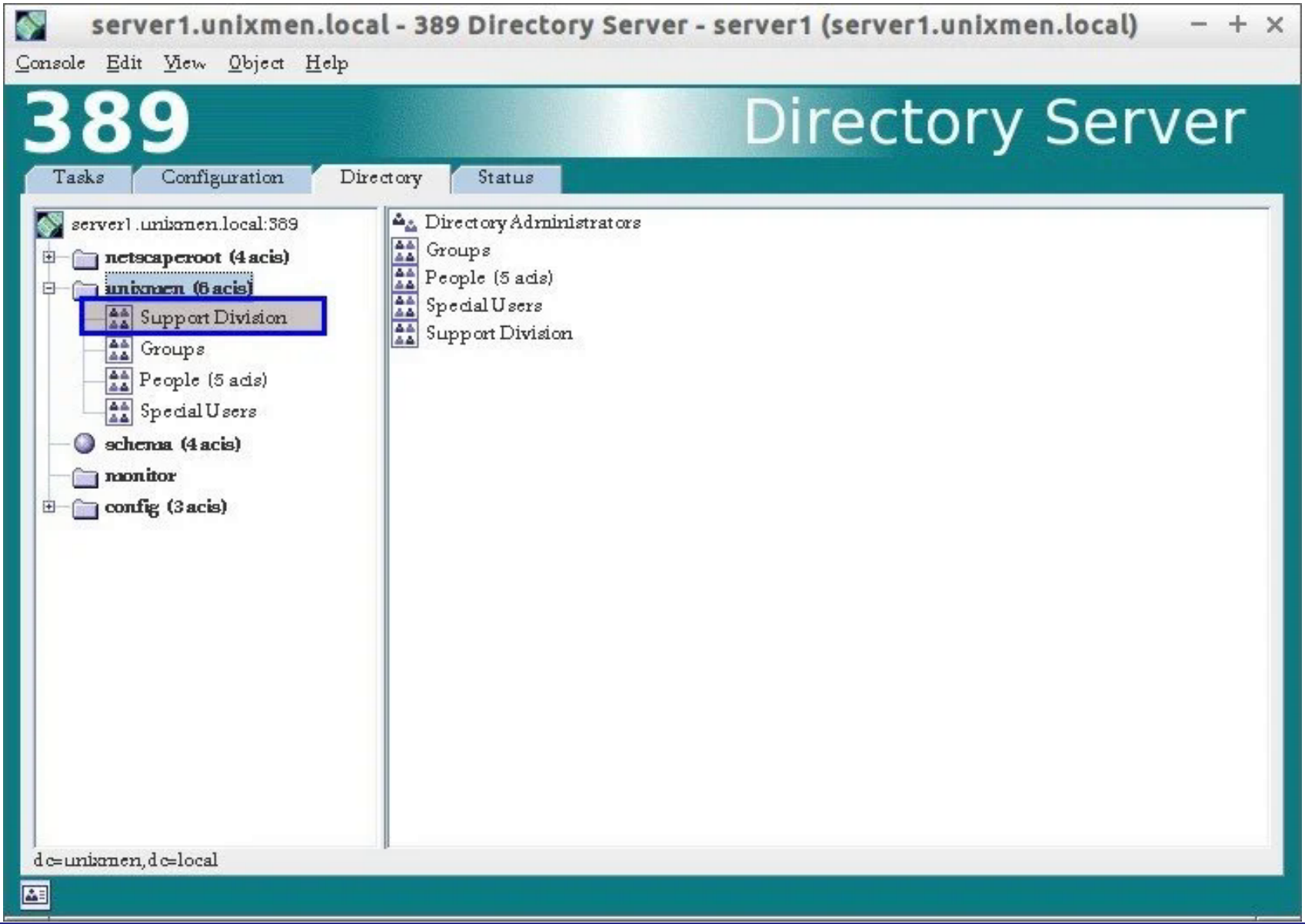
Cons

- Directory configuration and management are manual. Hence it is more time consuming and has a higher learning curve.
- OpenLDAP is a command-line application. However there are multiple LDAP browsers available which can be used in case a UI is required. Few of them listed below:
  - web2ldap
  - Apache Directory

Other free software LDAP implementations

389 DS

- Like OpenLDAP, 389 DS or 389 Directory Server is a LDAP implementation by RedHat as part of the community-supported Fedora project.
- 389 DS have a graphical interface that can be used for administration.


server1.unixmen.local - 389 Directory Server - server1 (server1.unixmen.local)
Console Edit View Object Help
389 Directory Server
Tasks Configuration Directory Status
server1.unixmen.local:389
netscaperoot (4 acis)
unixmen (6 acis)
Support Division
Groups
People (5 acis)
Special Users
schema (4 acis)
monitor
config (3 acis)
Directory Administrators
Groups
People (5 acis)
Special Users
Support Division
dc=unixmen,dc=local

FreeIPA

- FreeIPA is an identity management system created by RedHat. The aim with FreeIPA is to provide a centrally managed Identity, Policy and Audit(IPA) system.
  - Identity management ensure the right users have appropriate access to resources.
  - Security policies are a set of requirements to maintain a safe and secure computing environment.
  - Audit trail are records of events, procedures or operations being done on the system.
- FreeIPA uses a combination of different software inorder to acheive an IPA system. It uses Fedora, 389 DS, Kerberos, DNS, SSSD and other free and open source components.
- The advantage of using FreeIPA is that it is easy to setup. Since everything is taken care by FreeIPA for us it has less flexibilty comapred to OpenLDAP.
- FreeIPA has a Web UI for administration.

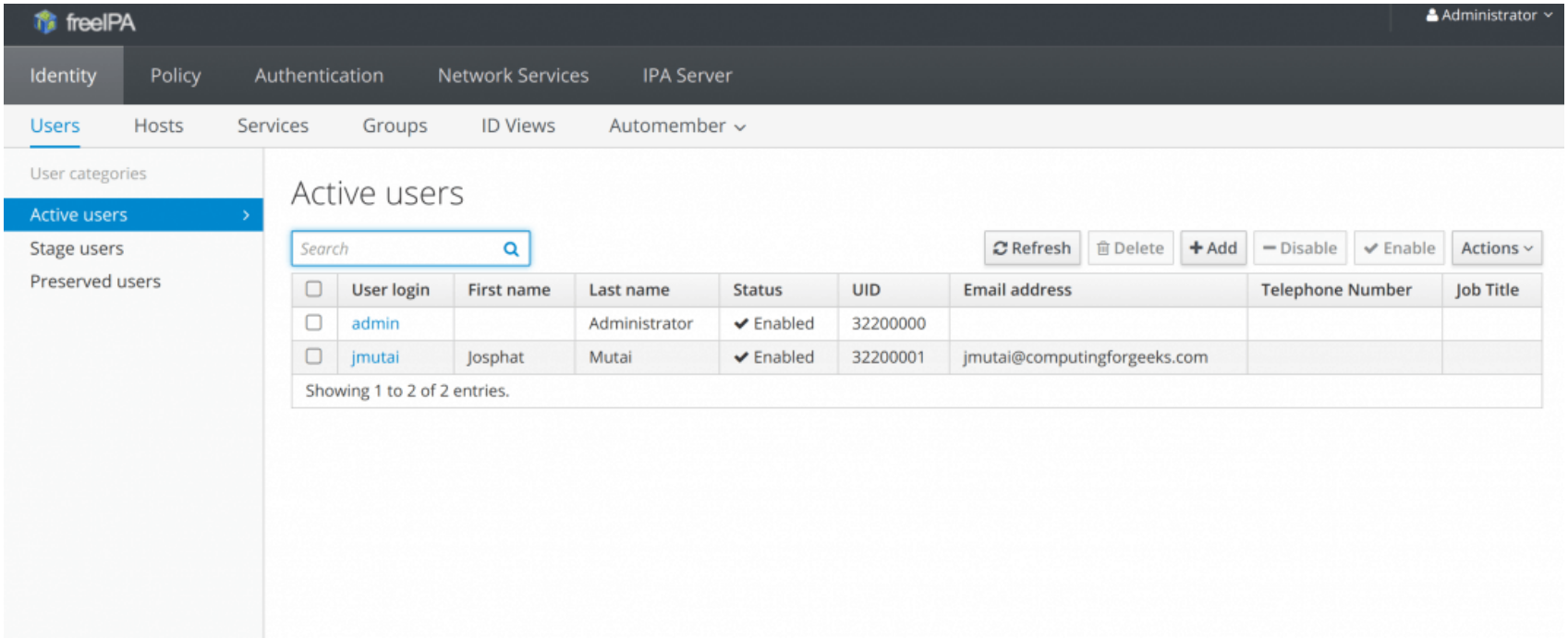


Figure 3: Web UI

Samba

- Samba runs on Unix platforms, but speaks to Windows clients like a native. It allows a Unix system to move into a Windows “Network Neighborhood” without causing a stir. Windows users can happily access file and print services without knowing or caring that those services are being offered by a Unix host.
- Samba is an open source CIFS implementation. CIFS or Common Internet File System is a protocol suite used to share files remotely via IP.
- Samba allows for a Linux server to act as a Domain Controller. By doing so, user credentials on the Windows domain can be used instead of needing to be recreated and then manually kept in sync on the Linux server.
- A domain controller is a server that manages network and identity security, effectively acting as the gatekeeper for user authentication and authorization to IT resources within the domain.