LDAP Account Manager - Manual

LDAP Account Manager - Manual

Table of Contents

List of Tables

Overview

LDAP Account Manager (LAM) manages user, group and host accounts in an LDAP directory. LAM runs on any webserver with PHP5 support and connects to your LDAP server unencrypted or via SSL/TLS.

LAM supports Samba 3/4, Unix, Kopano, Kolab 3, address book entries, NIS mail aliases, MAC addresses and much more. There is a tree viewer included to allow access to the raw LDAP attributes. You can use templates for account creation and use multiple configuration profiles.

https://www.ldap-account-manager.org/

Key features:

- managing user/group/host/domain entries
- account profiles
- account creation via file upload
- multiple configuration profiles
- LDAP browser
- schema browser
- OU editor
- PDF export for all accounts
- manage user/group Quota and create home directories

Requirements:

- PHP (>= 5.6.0)
- Any standard LDAP server (e.g. OpenLDAP, Active Directory, Samba 4, OpenDJ, 389 Directory Server, Apache DS, ...)
- A recent web browser that supports CSS2 and JavaScript, at minimum:
  - Firefox (max. 2 years old)
  - Chrome (max. 2 years old)
  - Internet Explorer 11 **(compatibility mode turned off)**
  - Opera (max. 2 years old)

The default password to edit the configuration options is "lam".

License:

LAM is published under the GNU General Public License. The complete list of licenses can be found in the copyright file.

Default password:

The default password for the LAM configuration is "lam".

Have fun!

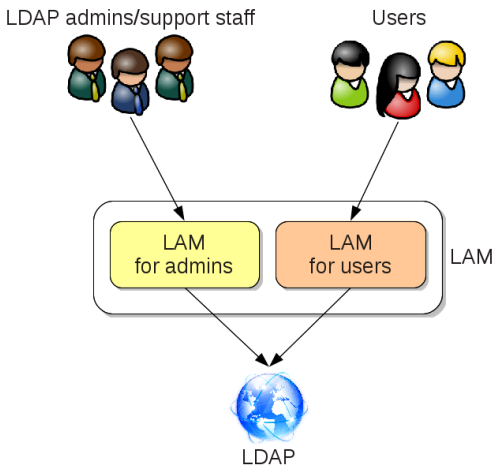
The LAM development team

Chapter 1. Big picture

Overview

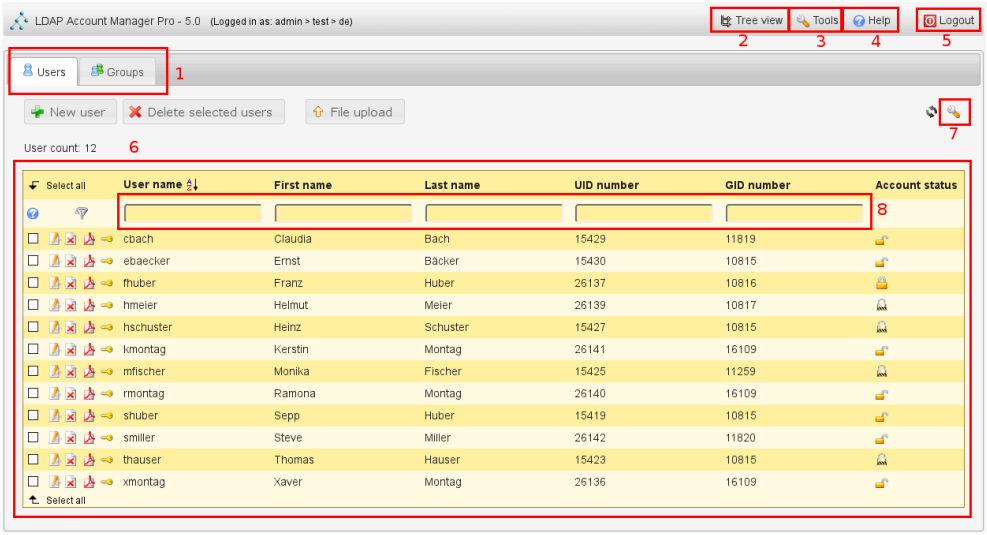
LAM has two major areas:

- Admin interface to manage all sorts of different LDAP entries (e.g. users/groups/hosts)
- Self service (LAM Pro) where end users can edit their own data



Admin interface

This is the main part of the application. It allows to manage a large list of LDAP entries (e.g. users, groups, DNS entries, ...). This part is accessed by LDAP admins and support staff.



Functional areas:

1. Account tabs: These tabs allow to switsch between different account types
2. Tree view: Provides an LDAP browser to edit LDAP entries on attribute level
3. Tools menu: Contains useful tools such as profile and PDF editor
4. Help: Link to manual

5. Logout: Logout of the application

6. List view: Lists all entries of the selected account type (e.g. users)

7. List configuration: Configuration settings for list view (e.g. number of entries per page)

8. Filter: Filter boxes allow to enter simple filters like "a*"

Self Service

The self service provides a simple interface for your users to edit their own data (e.g. telephone number). It also supports user self registration and password reset functionality.

You can fully customize the layout of the self service page.

Configuration

Configuration is done on multiple levels:

Global

Effective for all parts of LAM (e.g. logging and password policy).

Configured via LAM admin login -> LAM configuration -> Edit general settings.

Server profile

All settings for an LDAP connection (e.g. server name, LDAP suffixes, account types/modules to activate) in admin interface. There may be multiple for one LDAP server (e.g. for multiple departments, different user groups, ...).

Configured via LAM admin login -> LAM configuration -> Edit server profile.

Self service

All settings for a self service interface (e.g. fields that can be edited, password reset functionality, ...).

Configured via LAM admin login -> LAM configuration -> Edit self service.

Profiles

Account profiles store default values for new LDAP entries.

PDF structures

PDF structures define the layout and list of data fields to include in PDF export.

Glossary

Here you can find a list of common terms used in LAM.

Table 1.1. Glossary

Term	Description
Account module	Plugin for a specific account type (e.g. Unix plugin for user type)
Account type	Type of an LDAP entry (e.g. user/group/host)
Admin interface	LAM webpages for admin user (e.g. to create new users)
Lamdaemon	Support script to manage user file system quotas and create home directories
PDF editor	Manages PDF structures
PDF export	Exports an entry to PDF by using a PDF structure
PDF structure	Defines the layout and list of data fields to include in PDF export
Profile	Template for creation of LDAP entries, contains default values
Profile editor	Manages profiles for all account types
Self Service	LAM webpages for normal users where they can edit their own data
Self service profile	Configuration for self service pages (multiple configurations can exist)
Tree view	LDAP browser that allows to modify LDAP entries on attribute/object class level

Architecture

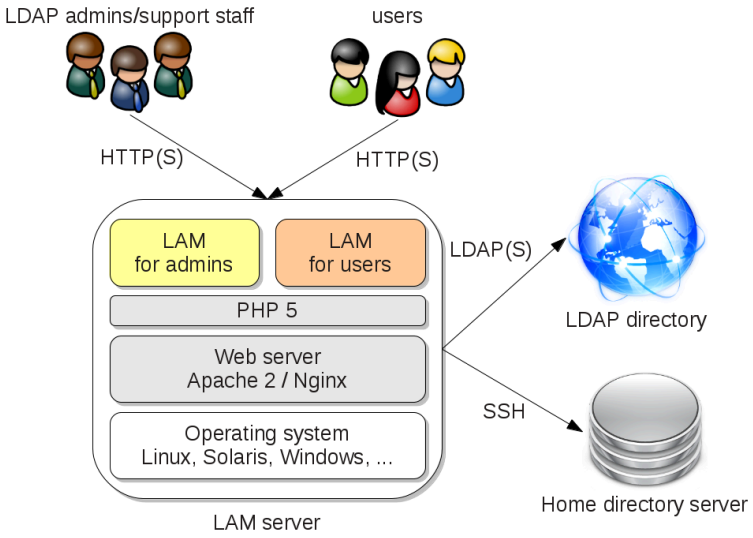
There are basically two groups of users for LAM:

- **LDAP administrators and support staff:**

  These people administer LDAP entries like user accounts, groups, ...

- **Users:**

  This includes all people who need to manage their own data inside the LDAP directory. E.g. these people edit their contact information with LAM self service (LAM Pro).



Therefore, LAM is split into two separate parts, LAM for admins and for users. LAM for admins allows to manage various types of LDAP entries (e.g. users, groups, hosts, ...). It also contains tools like batch upload, account profiles, LDAP schema viewer and an LDAP browser. LAM for users focuses on end users. It provides a self service for the users to edit their personal data (e.g. contact information). The LAM administrator is able to specify what data may be changed by the users. The design is also adaptable to your corporate design.

LAM for admins/users is accessible via HTTP(S) by all major web browsers (Firefox, IE, Opera, ...).

LAM runtime environment:

LAM runs on PHP. Therefore, it is independant of CPU architecture and operating system (OS). You can run LAM on any OS which supports Apache, Nginx or other PHP compatible web servers.

Home directory server:

You can manage user home directories and their quotas inside LAM. The home directories may reside on the server where LAM is installed or any remote server. The commands for home directory management are secured by SSH. LAM will use the user name and password of the logged in LAM administrator for authentication.

LDAP directory:

LAM connects to your LDAP server via standard LDAP protocol. It also supports encrypted connections with SSL and TLS.

Chapter 2. Installation

New installation

Requirements

LAM has the following requirements to run:

- Apache/Nginx webserver (SSL recommended) with PHP module (PHP (>= 5.6.0) with ldap, gettext, xml, openssl and optional OpenSSL)
- Some LAM plugins may require additional PHP extensions (you will get a note on the login page if something is missing)
- Perl (optional, needed only for lamdaemon)
- Any standard LDAP server (e.g. OpenLDAP, Active Directory, Samba 4, OpenDJ, 389 Directory Server, Apache DS, ...)
- A recent web browser that supports CSS2 and JavaScript, at minimum:
  - Firefox (max. 2 years old)
  - Internet Explorer 11 **(compatibility mode turned off)**
  - Opera (max. 2 years old)
  - Chrome (max. 2 years old)

OpenSSL will be used to store your LDAP password encrypted in the session file.

Please note that LAM does not ship with a selinux policy. Please disable selinux or create your own policy.

See LDAP schema fles for information about used LDAP schema files.

Prepackaged releases

LAM is available as prepackaged version for various platforms.

Debian

LAM is part of the official Debian repository. New releases are uploaded to unstable and will be available automatically in testing and the stable releases. You can run

apt-get install ldap-account-manager
to install LAM on your server. Additionally, you may download the latest LAM Debian packages from the LAM homepage [http://www.ldap-account-manager.org/] or the Debian package homepage [http://packages.debian.org/search?keywords=ldap-account-manager].

Installation of the latest packages on Debian

1. Install the LAM package

dpkg -i ldap-account-manager_*.deb

If you get any messages about missing dependencies run now: apt-get -f install

2. Install the lamdaemon package (optional)

   dpkg -i ldap-account-manager-lamdaemon_*.deb

Suse/Fedora/CentOS

There are RPM packages available on the LAM homepage [http://www.ldap-account-manager.org/]. The packages can be installed with these commands:

rpm -e ldap-account-manager ldap-account-manager-lamdaemon (if an older version is installed)

rpm -i <path to LAM package>

Note: The RPM packages for Fedora/CentOS do not contain a dependency to PHP due to the various package names for it. Please make sure that you install Apache/Nginx with PHP.

Other RPM based distributions

The RPM packages for Suse/Fedora are very generic and should be installable on other RPM-based distributions, too. The Fedora packages use apache:apache as file owner and the Suse ones use wwwrun:www.

FreeBSD

LAM is part of the official FreeBSD ports tree. For more details see these pages:

FreeBSD-SVN: http://svnweb.freebsd.org/ports/head/sysutils/ldap-account-manager/

FreshPorts: http://www.freshports.org/sysutils/ldap-account-manager

Installing the tar.bz2

Extract the archive

Please extract the archive with the following command:

tar xjf ldap-account-manager-<version>.tar.bz2

Install the files

Manual copy

Copy the files into the html-file scope of the web server. For example /apache/htdocs or /var/www/html.

Then set the appropriate file permissions inside the LAM directory:

- sess: write permission for apache/nginx user
- tmp: write permission for apache/nginx user
- tmp/internal: write permission for apache/nginx user
- config (with subdirectories): write permission for apache/nginx user
- lib/lamdaemon.pl: set executable

With configure script

Instead of manually copying files you can also use the included configure script to install LAM. Just run these commands in the extracted directory:

- ./configure
- make install

Options for "./configure":

- --with-httpd-user=USER USER is the name of your Apache/Nginx user account (default httpd)
- --with-httpd-group=GROUP GROUP is the name of your Apache/Nginx group (default httpd)
- --with-web-root=DIRECTORY DIRECTORY is the name where LAM should be installed (default /usr/local/lam)

Configuration files

Copy config/config.cfg.sample to config/config.cfg. Open the index.html in your web browser:

- Follow the link "LAM configuration" from the start page to configure LAM.
- Select "Edit general settings" to setup global settings and to change the master configuration password (default is "lam").
- Select "Edit server profiles" to setup a server profile.

Webserver configuration

Please see the Apache or Nginx chapter.

System configuration

PHP

LAM runs with PHP5 (>= 5.2.4). Needed changes in your php.ini:

memory_limit = 64M

For large installations (>10000 LDAP entries) you may need to increase the memory limit to 256M.

If you run PHP with activated Suhosin [http://www.hardened-php.net/suhosin/index.html] extension please check your logs for alerts. E.g. LAM requires that "suhosin.post.max_name_length" and "suhosin.request.max_varname_length" are increased (e.g. to 256).

Locales for non-English translation

If you want to use a translated version of LAM be sure to install the needed locales. The following table shows the needed locales for the different languages.

Table 2.1. Locales

Language	Locale
Catalan	ca_ES.utf8
Chinese (Simplified)	zh_CN.utf8
Chinese (Traditional)	zh_TW.utf8
Czech	cs_CZ.utf8
Dutch	nl_NL.utf8
English - Great Britain	no extra locale needed
English - USA	en_US.utf8
French	fr_FR.utf8
German	de_DE.utf8
Hungarian	hu_HU.utf8
Italian	it_IT.utf8
Japanese	ja_JP.utf8
Polish	pl_PL.utf8
Portuguese	pt_BR.utf8
Russian	ru_RU.utf8
Slovak	sk_SK.utf8
Spanish	es_ES.utf8
Turkish	tr_TR.utf8
Ukrainian	uk_UA.utf8

You can get a list of all installed locales on your system by executing:

locale -a

Debian users can add locales with "dpkg-reconfigure locales".

Upgrading LAM or migrate from LAM to LAM Pro

Upgrading from LAM to LAM Pro is like installing a new LAM version. Simply install the LAM Pro packages/tar.bz2 instead of the LAM ones.

Upgrade LAM

Backup configuration files

Configuration files need only to be backed up for .tar.bz2 installations. DEB/RPM installations do not require this step.

LAM stores all configuration files in the "config" folder. Please backup the following files and copy them after the new version is installed.

config/*.conf
config/config.cfg
config/pdf/*.xml
config/profiles/*

LAM Pro only:

config/selfService/*.*

Uninstall current LAM (Pro) version

If you used the RPM installation packages then remove the ldap-account-manager and ldap-account-manager-lamdaemon packages by calling "rpm -e ldap-account-manager ldap-account-manager-lamdaemon".

Debian needs no removal of old packages.

For tar.bz2 please remove the folder where you installed LAM via configure or by copying the files.

Install new LAM (Pro) version

Please install the new LAM (Pro) release. Skip the part about setting up LAM configuration files.

Restore configuration files

RPM:

Please check if there are any files ending with ".rpmsave" in /var/lib/ldap-account-manager/config. In this case you need to manually remove the .rpmsave extension by overwriting the package file. E.g. rename default.user.rpmsave to default.user.

DEB:

Nothing needs to be restored.

tar.bz2:

Please restore your configuration files from the backup. Copy all files from the backup folder to the config folder in your LAM Pro installation. Do not simply replace the folder because the new LAM (Pro) release might include additional files in this folder. Overwrite any existing files with your backup files.

Final steps

Now open your webbrowser and point it to the LAM login page. All your settings should be migrated.

Please check also the version specific instructions. They might include additional actions.

Version specific upgrade instructions

You need to follow all steps from your current version to the new version. Unless explicitly noticed there is no need to install an intermediate release.

6.1 -> 6.2

No actions required.

6.0 -> 6.1

DEB+RPM configuration for nginx uses PHP 7 by default. Please see /etc/ldap-account-manager/nginx.conf if you use PHP 5.

5.7 -> 6.0

No actions needed.

5.6 -> 5.7

Windows: The department attribute was changed from "departmentNumber" to "department" to match Windows user manager. The attribute "departmentNumber" is no more supported by the Windows module. You will need to reactivate the department option in your server profile on module settings tab.

5.5 -> 5.6

Mail routing: No longer added by default. Use profile editor to activate by default for new users/groups.

Personal/Unix/Windows: no more replacement of e.g. $user/$group on user upload

5.4 -> 5.5

LAM Pro requires a license key. You can find it in your customer profile [https://www.ldap-account-manager.org/lamcms/user/me].

5.1 -> 5.4

No special actions needed.

5.0 -> 5.1

Self Service: There were large changes to provide a responsive design that works for desktop and mobile. If you use custom CSS to style Self Service then this must be updated.

4.9 -> 5.0

Samba 3: If you used logon hours then you need to set the correct time zone on tab "Generel settings" in server profile.

4.5 -> 4.9

No special actions needed.

4.4 -> 4.5

LAM will no longer follow referrals by default. This is ok for most installations. If you use LDAP referrals please activate referral following for your server profile (tab General settings -> Server settings -> Advanced options).

The self service pages now have an own option for allowed IPs. If your LAM installation uses IP restrictions please update the LAM main configuration.

Password self reset (LAM Pro) allows to set a backup email address. You need to update the LDAP schema if you want to use this feature.

4.3 -> 4.4

Apache configuration: LAM supports Apache 2.2 and 2.4. This requires that your Apache server has enabled the "version" module. For Debian and Fedora this is the default setup. The Suse RPM will try to enable the version module during installation.

Kolab: User accounts get the object class "mailrecipient" by default. You can change this behaviour in the module settings section of your LAM server profile.

Windows: sAMAccountName is no longer set by default. Enable it in server profile if needed. The possible domains for the user name can also be set in server profile.

4.2.1 -> 4.3

LAM is no more shipped as tar.gz package but as tar.bz2 which allows smaller file sizes.

4.1 -> 4.2/4.2.1

Zarafa users: The default attribute for mail aliases is now "dn". If you use "uid" and did not change the server profile for a long time please check your LAM server profile for this setting and save it.

4.0 -> 4.1

Unix: The list of valid login shells is no longer configured in "config/shells" but in the server/self service profiles (Unix settings). LAM will use the following shells by default: /bin/bash, /bin/csh, /bin/dash, /bin/false, /bin/ksh, /bin/sh.

Please update your server/self service profile if you would like to change the list of valid login shells.

3.9 -> 4.0

The account profiles and PDF structures are now separated by server profile. This means that if you edit e.g. an account profile in server profile A then this change will not affect the account profiles in server profile B.

LAM will automatically migrate your existing files as soon as the login page is loaded.

Special install instructions:

- Debian: none, config files will be migrated when opening LAM's login page
- Suse/Fedora RPM:
  - Run "rpm -e ldap-account-manager ldap-account-manager-lamdaemon"
  - You may get warnings like "warning: /var/lib/ldap-account-manager/config/profiles/default.user saved as /var/lib/ldap-account-manager/config/profiles/default.user.rpmsave"
  - Please rename all files "*.rpmsave" and remove the file extension ".rpmsave". E.g. "default.user.rpmsave" needs to be renamed to "default.user".
  - Install the LAM packages with "rpm -i". E.g. "rpm -i ldap-account-manager-4.0-0.suse.1.noarch.rpm".
  - Open LAM's login page in your browser to complete the migration
- tar.gz: standard upgrade steps, config files will be migrated when opening LAM's login page

3.7 -> 3.9

No changes.

3.6 -> 3.7

Asterisk extensions: The extension entries are now grouped by extension name and account context. LAM will automatically assign priorities and set same owners for all entries.

3.5.0 -> 3.6

Debian users: LAM 3.6 requires to install FPDF 1.7. You can download the package here [http://packages.debian.org/search?keywords=php-fpdf&searchon=names&suite=all&section=all]. If you use Debian Stable (Squeeze) please use the package from Testing (Wheezy).

3.4.0 -> 3.5.0

LAM Pro: The global config/passwordMailTemplate.txt is no longer supported. You can setup the mail settings now for each LAM server profile which provides more flexibility.

Suse/Fedora RPM installations: LAM is now installed to /usr/share/ldap-account-manager and /var/lib/ldap-account-manager.

Please note that configuration files are not migrated automatically. Please move the files from /srv/www/htdocs/lam/config (Suse) or /var/www/html/lam/config (Fedora) to /var/lib/ldap-account-manager/config.

3.3.0 -> 3.4.0

No changes.

3.2.0 -> 3.3.0

If you use custom images for the PDF export then these images need to be 5 times bigger than before (e.g. 250x250px instead of 50x50px). This allows to use images with higher resolution.

3.1.0 -> 3.2.0

No changes.

3.0.0 -> 3.1.0

LAM supported to set a list of valid workstations on the "Personal" page. This required to change the LDAP schema. Since 3.1.0 this is replaced by the new "Hosts" module for users.

Lamdaemon: The sudo entry needs to be changed to ".../lamdaemon.pl *".

2.3.0 -> 3.0.0

No changes.

2.2.0 -> 2.3.0

LAM Pro: There is now a separate account type for group of (unique) names. Please edit your server profiles to activate the new account type.

1.1.0 -> 2.2.0

No changes.

Uninstallation of LAM (Pro)

If you used the prepackaged installation packages then remove the ldap-account-manager and ldap-account-manager-lamdaemon packages.

Otherwise, remove the folder where you installed LAM via configure or by copying the files.

Migration to a new server

To move LAM (Pro) from one server to another please follow these steps:

1. Install LAM (Pro) on your new server

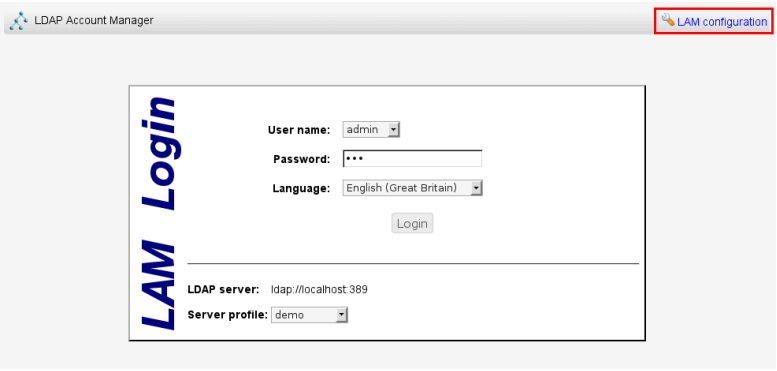
2. Copy the following files from the old server to the new one (base directory for RPM/DEB is /usr/share/ldap-account-manager/):
   - config/*.conf
   - config/config.cfg
   - config/pdf/*
   - config/profiles/*
   - config/selfService/*.* (needed for LAM Pro only)

   The files must be writable for the webserver user.
3. Open LAM (Pro) login page on new server and verify installation.
4. Uninstall LAM (Pro) on old server.

Chapter 3. Configuration

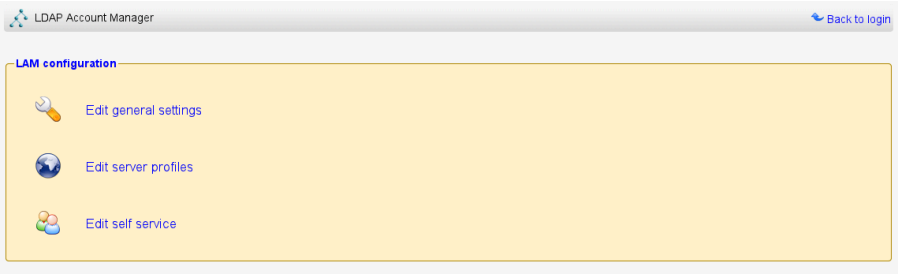
After you installed LAM you can configure it to fit your needs. The complete configuration can be done inside the application. There is no need to edit configuration files.

Please point you browser to the location where you installed LAM. E.g. for Debian/RPM this is http://yourServer/lam. If you installed LAM via the tar.bz2 then this may vary. You should see the following page:



If you see an error message then you might need to install an additional PHP extension. Please follow the instructions and reload the page afterwards.

Now you are ready to configure LAM. Click on the "LAM configuration" link to proceed.



Here you can change LAM's general settings, setup server profiles for your LDAP server(s) and configure the self service (LAM Pro). You should start with the general settings and then setup a server profile.

General settings

After selecting "Edit general settings" you will need to enter the master configuration password. The default password for new installations is "lam". Now you can edit the general settings.

License (LAM Pro only)

This is only required when you run LAM Pro. Please enter the license key from your customer profile [https://www.ldap-account-manager.org/lamcms/user/me]. In case you have purchased multiple licenses please only enter one license key block per installation.

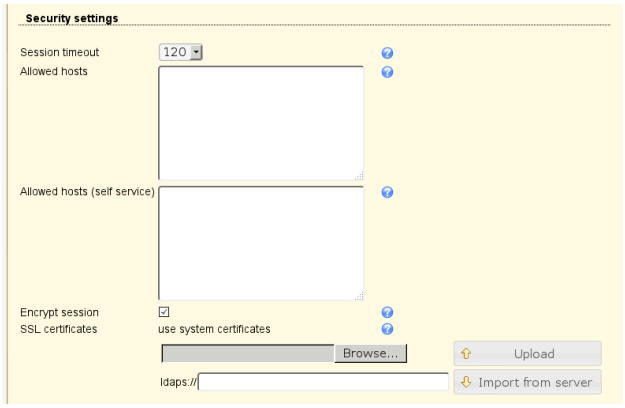
When you entered the license key then the license details can be seen on LAM configuration overview page.

Security settings

Here you can set a time period after which inactive sessions are automatically invalidated. The selected value represents minutes of inactivity.

You may also set a list of IP addresses which are allowed to access LAM. The IPs can be specified as full IP (e.g. 123.123.123.123) or with the "*" wildcard (e.g. 123.123.123.*). Users which try to access LAM via an untrusted IP only get blank pages. There is a separate field for LAM Pro self service.

Session encryption will encrypt sensitive data like passwords in your session files. This is only available when PHP OpenSSL [http://php.net/manual/en/book.openssl.php] is active. This adds extra security but also costs performance. If you manage a large directory you might want to disable this and take other actions to secure your LAM server.



SSL certificate setup:

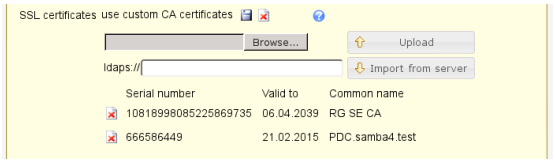
By default, LAM uses the CA certificates that are preinstalled on your system. This will work if you connect via SSL/TLS to an LDAP server that uses a certificate signed by a well-known CA. In case you use your own CA (e.g. company internal CA) you can import the CA certificates here.

Please note that this can affect other web applications on the same server if they require different certificates. There seem to be problems on Debian systems and you may also need to restart Apache. In case of any problems please delete the uploaded certificates and use the system setup.

You can either upload a DER/PEM formatted certificate file or import the certificates directly from an LDAP server that is available with LDAP+SSL (ldaps://). LAM will automatically override system certificates if at least one certificate is uploaded/imported.

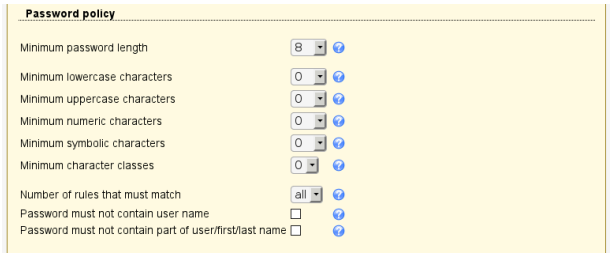
The whole certificate list can be downloaded in PEM format. You can also delete single certificates from the list.

Please note that you might need to restart your webserver if you do any changes to this configuration.



Password policy

This allows you to specify a central password policy for LAM. The policy is valid for all password fields inside LAM admin (excluding tree view) and LAM self service. Configuration passwords do not need to follow this policy.



You can set the minimum password length and also the complexity of the passwords.

Logging

LAM can log events (e.g. user logins). You can use system logging (syslog for Unix, event viewer for Windows) or log to a separate file. Please note that LAM may log sensitive data (e.g. passwords) at log level "Debug". Production systems should be set to "Warning" or "Error".

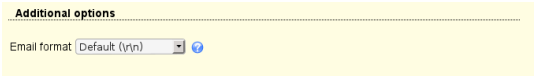
The PHP error reporting is only for developers. By default LAM does not show PHP notice messages in the web pages. You can select to use the php.ini setting here or printing all errors and notices.

Additional options

Email format

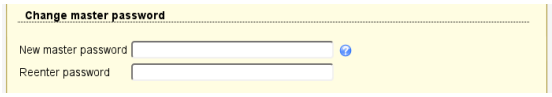
Some email servers are not standards compatible. If you receive mails that look broken you can change the line endings for sent mails here. Default is to use "\r\n".

At the moment, this option is only available in LAM Pro as there is no mail sending in the free version. See here for setting up your SMTP server.



Change master password

If you would like to change the master configuration password then enter a new password here.



Server profiles

The server profiles store information about your LDAP server (e.g. host name) and what kind of accounts (e.g. users and groups) you would like to manage. There is no limit on the number of server profiles. See the typical scenarios about how to structure your server profiles.

Manage server profiles

Select "Manage server profiles" to open the profile management page.

Here you can create, rename and delete server profiles. The passwords of your server profiles can also be reset.

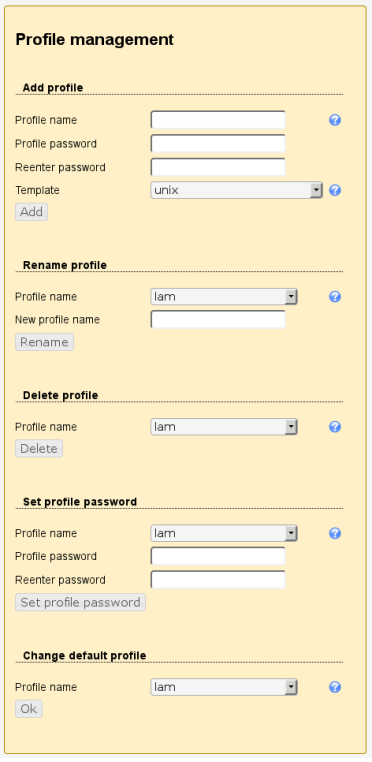
You may also specify the default server profile. This is the server profile which is preselected at the login page. It also specifies the language of the login and configuration pages.

Templates for new server profiles

You can create a new server profile based on one of the built-in templates or any existing profile. Of course, the account types and selected modules can be changed after you created your profile.

Built-in templates:

- addressbook: simple profile for user management with inetOrgPerson object class
- samba3: Samba 3 users, groups, hosts and domains
- unix: Unix users and groups (posixAccount/Group)
- windows_samba4: Active Directory user, group and host management



All operations on the profile management page require that you authenticate yourself with the configuration master password.

Editing a server profile

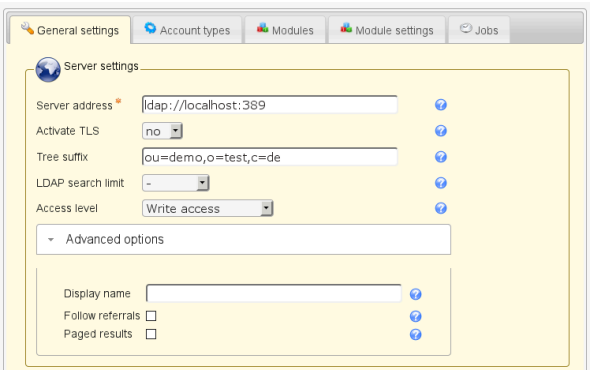
Please select you server profile and enter its password to edit a server profile.

Each server profile contains the following information:

- **General settings:** general settings about your LDAP server (e.g. host name and security settings)
- **Account types:** list of account types (e.g. users and groups) that you would like to manage and type specific settings (e.g. LDAP suffix)
- **Modules:** list of modules which define what account aspects (e.g. Unix, Samba, Kolab) you would like to manage
- **Module settings:** settings which are specific for the selected account modules on the page before

General settings

Here you can specify the LDAP server and some security settings.



The server address of your LDAP server can be a DNS name or an IP address. Use ldap:// for unencrypted LDAP connections or TLS encrypted connections. LDAP+SSL (LDAPS) encrypted connections are specified with ldaps://. The port value is optional. TLS cannot be combined with ldaps://.

Hint: If you use a master/slave setup with referrals then point LAM to your master server. Due to bugs in the underlying LDAP libraries pointing to a slave might cause issues on write operations.

LAM includes an LDAP browser which allows direct modification of LDAP entries. If you would like to use it then enter the LDAP suffix at "Tree suffix".

The search limit is used to reduce the number of search results which are returned by your LDAP server.

The access level specifies if LAM should allow to modify LDAP entries. This feature is only available in LAM Pro. LAM non-Pro releases use write access. See this page for details on the different access levels.

Advanced options

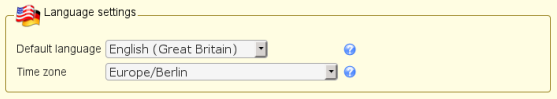
Sometimes, you may not want to display the server address on the login page. In this case you can setup a display name here (e.g. "Production").

By default LAM will not follow LDAP referrals. This is ok for most installations. If you use LDAP referrals please activate the referral option in advanced settings.

Paged results should be activated only if you encounter any problems regarding size limits on Active Directory. LAM will then query LDAP to return results in chunks of 999 entries.

LAM is translated to many different languages. Here you can select the default language for this server profile. The language setting may be overriden at the LAM login page.

Please also set your time zone here.

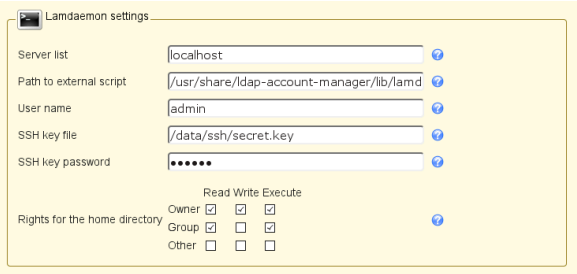


LAM can manage user home directories and quotas with an external script. You can specify the home directory server and where the script is located. The default rights for new home directories can be set, too.

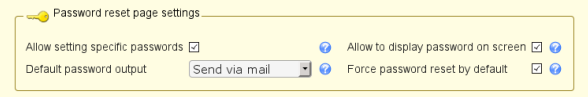
You can provide a fixed user name. If you leave the field empty then LAM will use your current account (the account you used to login to LAM).

There are two possibilities to connect to your home directory/quota server:

- SSH key (recommended): Please generate a SSH key pair and provide the location to the **private** key file. If the key is protected by a password you can also specify it here.
- Password: If you do not set a SSH key then LAM will try to connect with your current account (the password you used to login to LAM).

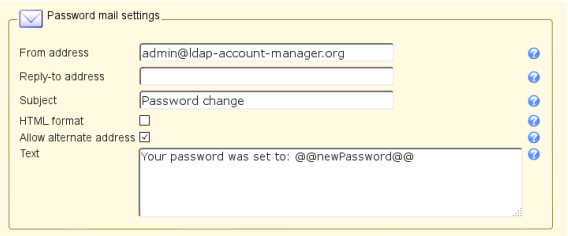


LAM Pro users may directly set passwords from list view. You can configure if it should be possible to set specific passwords and showing password on screen is allowed.



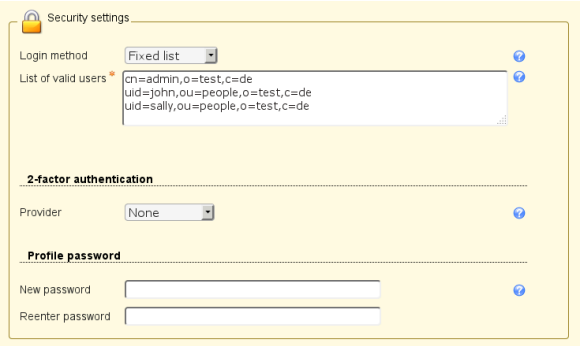
LAM Pro users can send out changed passwords to their users. Here you can specify the options for these mails.

If you select "Allow alternate address" then password mails can be sent to any address (e.g. a secondary address if the user account is also bound to the mailbox).



LAM supports two methods for login:

- Fixed list
- LDAP search

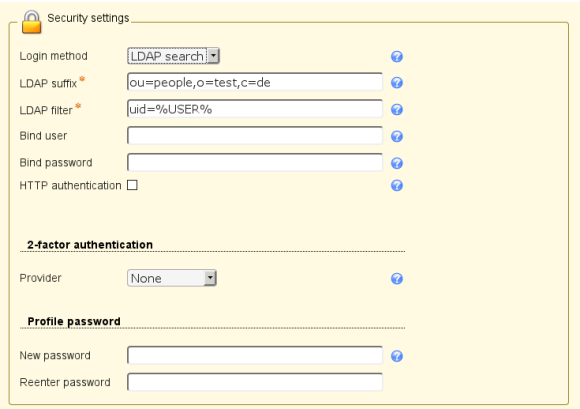


The first one is to specify a fixed list of LDAP DNs that are allowed to login. Please enter one DN per line.

The second one is to let LAM search for the DN in your directory. E.g. if a user logs in with the user name "joe" then LAM will do an LDAP search for this user name. When it finds a matching DN then it will use this to authenticate the user. The wildcard "%USER%" will be replaced by "joe" in this example. This way you can provide login by user name, email address or other LDAP attributes.

Additionally, you can enable HTTP authentication when using "LDAP search". This way the web server is responsible to authenticate your users. LAM will use the given user name + password for the LDAP login. You can also configure this to setup advanced login restrictions (e.g. require group memberships for login). To setup HTTP authentication in Apache please see this link [http://httpd.apache.org/docs/2.2/howto/auth.html] and an example for LDAP authentication here.

Hint: LDAP search with group membership check can be done with either HTTP authentication or LDAP overlays like "memberOf" [http://www.openldap.org/doc/admin24/overlays.html] or "Dynamic lists" [http://www.openldap.org/doc/admin24/overlays.html]. Dynamic lists allow to insert virtual attributes to your user entries. These can then be used for the LDAP filter (e.g. "(&(uid=%USER%)(memberof=cn=admins,ou=groups,dc=company,dc=com))").



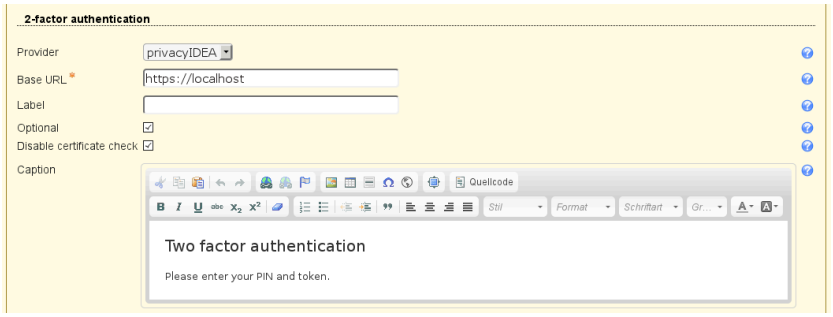
2-factor authentication

LAM supports 2-factor authentication for your users. This means the user will not only authenticate by user+password but also with e.g. a token generated by a mobile device. This adds more security because the token is generated on a physically separated device (typically mobile phone).

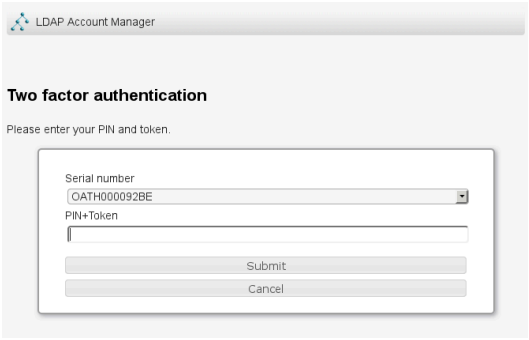
The token is validated by a second application. LAM currently supports:

- privacyIdea [https://www.privacyidea.org/]

By default LAM will enforce to use a token and reject users that did not setup one. You can set this check to optional. But if a user has setup a token then this will always be required.

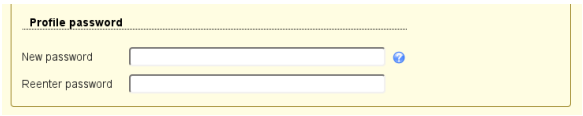


After logging in with user + password LAM will ask for the 2nd factor. If the user has setup multiple factors then he can choose one of them.



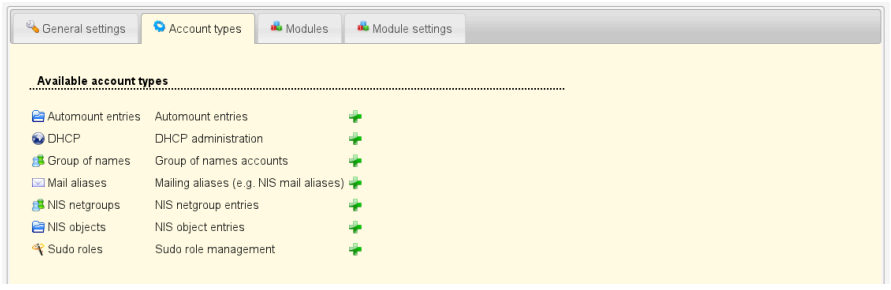
Password

You may also change the password of this server profile. Please just enter the new password in both password fields.



Account types

LAM supports to manage various types of LDAP entries (e.g. users, groups, DHCP entries, ...). On this page you can select which types of entries you want to manage with LAM.



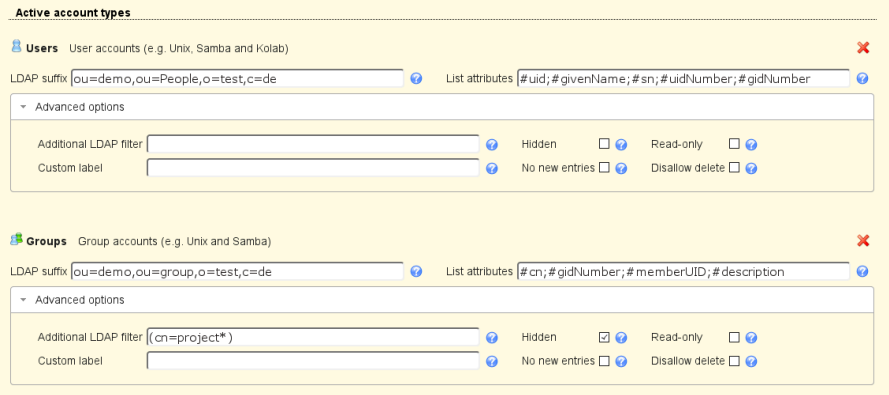
The section at the top shows a list of possible types. You can activate them by simply clicking on the plus sign next to it.

Each account type has the following options:

- **LDAP suffix:** the LDAP suffix where entries of this type should be managed
- **List attributes:** a list of attributes which are shown in the account lists
- **Additional LDAP filter:** LAM will automatically detect the right LDAP entries for each account type. This can be used to further limit the number of visible entries (e.g. if you want to manage only some specific groups).

You can use "@@LOGIN_DN@@" as wildcard (e.g. "(owner=@@LOGIN_DN@@)"). It will be replaced by the DN of the user who is logged in.

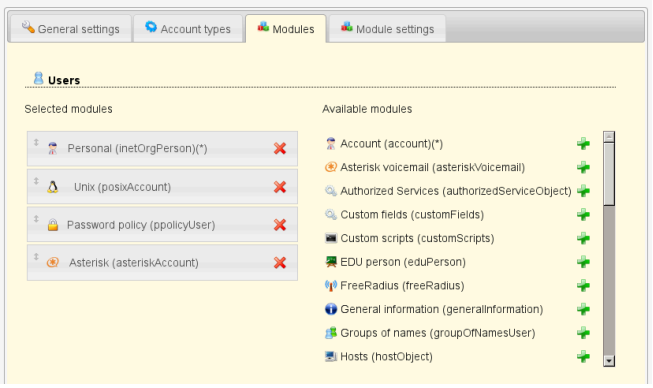
- **Hidden:** This is used to hide account types that should not be displayed but are required by other account types. E.g. you can hide the Samba domains account type and still assign domains when you edit your users.
- **Read-only (LAM Pro only):** This allows to set a single account type to read-only mode. Please note that this is a restriction on functional level (e.g. group memberships can be changed on user page even if groups are read-only) and is no replacement for setting up proper ACLs on your LDAP server.
- **Custom label:** Here you can set a custom label for the account types. Use this if the standard label does not fit for you (e.g. enter "Servers" for hosts).
- **No new entries (LAM Pro only):** Use this if you want to prevent that new accounts of this type are created by your users. The GUI will hide buttons to create new entries and also disable file upload for this type.
- **Disallow delete (LAM Pro only):** Use this if you want to prevent that accounts of this type are deleted by your users.



On the next page you can specify in detail what extensions should be enabled for each account type.

Modules

The modules specify the active extensions for each account type. E.g. here you can setup if your user entries should be address book entries only or also support Unix or Samba.

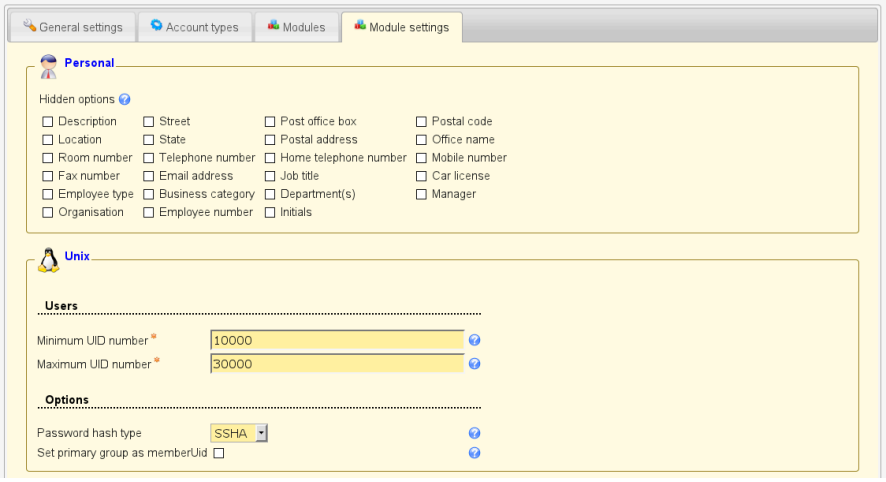


Each account type needs a so called "base module". This is the basement for all LDAP entries of this type. Usually, it provides the structural object class for the LDAP entries. There must be exactly one active base module for each account type.

Furthermore, there may be any number of additional active account modules. E.g. you may select "Personal" as base module and Unix + Samba as additional modules.

Module settings

Depending on the activated account modules there may be additional configuration options available. They can be found on the "Module settings" tab. E.g. the Personal account module allows to hide several input fields and the Unix module requires to specify ranges for UID numbers.



Cron jobs (LAM Pro)

LAM Pro can execute common tasks via cron job. This can be used to e.g. notify your users before their passwords expire.

LDAP and database configuration

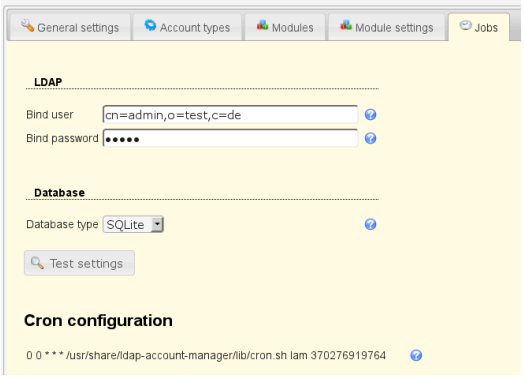
Please add the LDAP bind user and password for all jobs. This LDAP account will be used to perform all LDAP read and write operations.

Next, select the database type where LAM should store job related data. Supported databases are SQLite and MySQL.

SQLite

This is a simple file based database. It needs no special database server. The database file will be located next to the server profile in config directory.

You will need to install the SQLite PDO module for PHP (pdo_sqlite.so). For Debian this is located in package php5-sqlite.



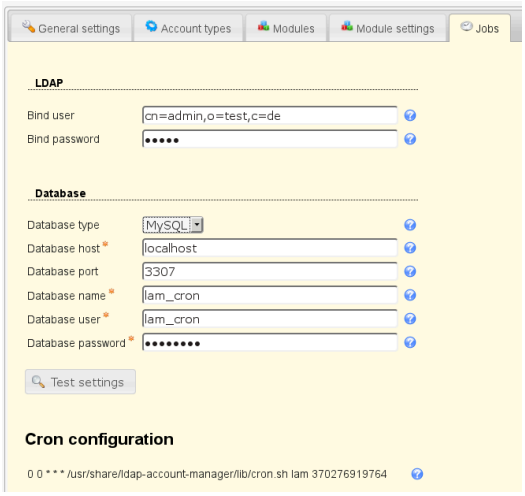
MySQL

This will store all job data in an external MySQL database.

You will need to install the MySQL PDO module for PHP (pdo_mysql.so). For Debian this is located in package php5-mysql.

Steps to create a MySQL database and user:

```
# login
mysql -u root -p
# create a database
mysql> create database lam_cron;
#
mysql> CREATE USER 'lam_cron'@'%' IDENTIFIED BY 'password';
mysql> CREATE USER 'lam_cron'@'localhost' IDENTIFIED BY 'password';
# grant access for new user
mysql> GRANT ALL PRIVILEGES ON lam_cron.* TO 'lam_cron'@'%';
mysql> GRANT ALL PRIVILEGES ON lam_cron.* TO 'lam_cron'@'localhost';
```



Test your settings

After the LDAP and database settings are done you can test your settings.

Cron entry

LAM also prints the crontab line that you need to run the configured jobs on a daily basis. The command must be run as the same user as your webserver is running. You are free to change the starting time of the script or run it more often.

Dry-run: You can perform a dry-run of the job. This will not perform any actions but only print what would be done. For this please put "--dryRun" at the end of the command. E.g.:

```
/usr/share/ldap-account-manager/lib/cron.sh lam 123456789 --dryRun
```

Adding jobs

To add a new job just click on the "Add job" button and select the job type you need. The list of available jobs depends on your active account modules. E.g. the PPolicy job will only be available if you activated PPolicy user module.

Depending on the job type jobs may be added multiple times with different configurations. For descriptions about the available job types see next chapters.

PPolicy: Notify users about password expiration

This will send your users an email reminder before their password expires.

You need to activate the PPolicy module for users to be able to add this job. The job can be added multiple times (e.g. to send a second warning at a later time).

LAM calculates the expiration date based on the last password change and the assigned password policy (or the default policy) using attributes pwdMaxAge and pwdExpireWarning.

Examples:

Warning time (pwdExpireWarning) = 14 days, notification period = 10: LAM will send out the email 24 days before the password expires

Warning time (pwdExpireWarning) = 14 days, notification period = 0: LAM will send out the email 14 days before the password expires

No warning time (pwdExpireWarning), notification period = 10: LAM will send out the email 10 days before the password expires

Table 3.1. Options

Option	Description
From address	The email address to set as FROM.
Reply-to address	Optional Reply-to address for email.
CC address	Optional CC mail address.
BCC address	Optional BCC mail address.
Subject	The email subject line. Supports wildcards, see below.
Text	The email body text. Supports wildcards, see below.
Notification period	Number of days to notify before password expires.

Default password policy	Default PPolicy password policy entry (object class "pwdPolicy").

Wildcards:

You can enter LDAP attributes as wildcards in the form @@ATTRIBUTE_NAME@@. E.g. to add the user's common name use "@@cn@@". For the common name it would be "@@cn@@".

There are also two special wildcards for the expiration date. @@EXPIRE_DATE_DDMMYYYY@@ will print the date as e.g. "31.12.2016". @@EXPIRE_DATE_YYYYMMDD@@ will print the date as e.g. "2016-12-31".

389ds: Notify users about password expiration

This will send your users an email reminder before their password expires.

You need to activate the Account Locking module for users to be able to add this job. The job can be added multiple times (e.g. to send a second warning at a later time).

LAM calculates the expiration date based on the attribute passwordExpirationTime.

Table 3.2. Options

Option	Description
From address	The email address to set as FROM.
Reply-to address	Optional Reply-to address for email.
CC address	Optional CC mail address.
BCC address	Optional BCC mail address.
Subject	The email subject line. Supports wildcards, see below.
Text	The email body text. Supports wildcards, see below.
Notification period	Number of days to notify before password expires.

Wildcards:

You can enter LDAP attributes as wildcards in the form @@ATTRIBUTE_NAME@@. E.g. to add the user's common name use "@@cn@@". For the common name it would be "@@cn@@".

There are also two special wildcards for the expiration date. @@EXPIRE_DATE_DDMMYYYY@@ will print the date as e.g. "31.12.2016". @@EXPIRE_DATE_YYYYMMDD@@ will print the date as e.g. "2016-12-31".

Shadow: Notify users about password expiration

This will send your users an email reminder before their password expires.

You need to activate the Shadow module for users to be able to add this job. The job can be added multiple times (e.g. to send a second warning at a later time).

LAM calculates the expiration date based on the last password change, the password warning time (attribute "shadowWarning") and the specified notification period.

Examples:

Warning time = 14, notification period = 10: LAM will send out the email 24 days before the password expires

Warning time = 14, notification period = 0: LAM will send out the email 14 days before the password expires

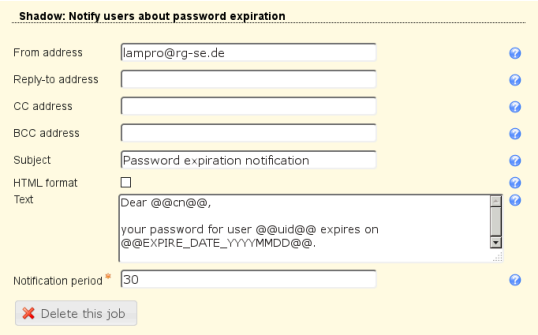


Table 3.3. Options

Option	Description
From address	The email address to set as FROM.
Reply-to address	Optional Reply-to address for email.
CC address	Optional CC mail address.
BCC address	Optional BCC mail address.
Subject	The email subject line. Supports wildcards, see below.
Text	The email body text. Supports wildcards, see below.
Notification period	Number of days to notify before password expires.

Wildcards:

You can enter LDAP attributes as wildcards in the form @@ATTRIBUTE_NAME@@. E.g. to add the user's common name use "@@cn@@". For the common name it would be "@@cn@@".

There are also two special wildcards for the expiration date. @@EXPIRE_DATE_DDMMYYYY@@ will print the date as e.g. "31.12.2016". @@EXPIRE_DATE_YYYYMMDD@@ will print the date as e.g. "2016-12-31".

Shadow: Delete or move expired accounts

You can automatically delete or move expired accounts. The job checks Shadow account expiration dates (not password expiration dates).

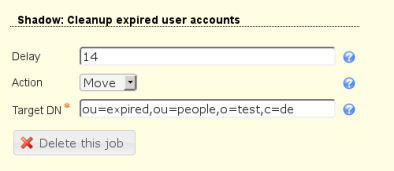


Table 3.4. Options

Option	Description
Delay	Number of days to wait after the account is expired.
Action	Delete or move accounts
Target DN	Move only: specifies the DN where accounts are moved

Windows: Notify users about password expiration

This will send your users an email reminder before their password expires.

You need to activate the Windows module for users to be able to add this job. The job can be added multiple times (e.g. to send a second warning at a later time).

LAM calculates the expiration date based on the last password change and the domain policy.

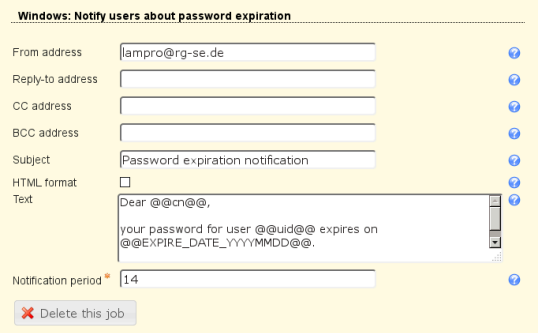


Table 3.5. Options

Option	Description
From address	The email address to set as FROM.
Reply-to address	Optional Reply-to address for email.
CC address	Optional CC mail address.
BCC address	Optional BCC mail address.
Subject	The email subject line. Supports wildcards, see below.
Text	The email body text. Supports wildcards, see below.
Notification period	Number of days to notify before password expires.

Wildcards:

You can enter LDAP attributes as wildcards in the form @@ATTRIBUTE_NAME@@. E.g. to add the user's common name use "@@cn@@". For the common name it would be "@@cn@@".

There are also two special wildcards for the expiration date. @@EXPIRE_DATE_DDMMYYYY@@ will print the date as e.g. "31.12.2016". @@EXPIRE_DATE_YYYYMMDD@@ will print the date as e.g. "2016-12-31".

Windows: Delete or move expired accounts

You can automatically delete or move expired accounts.

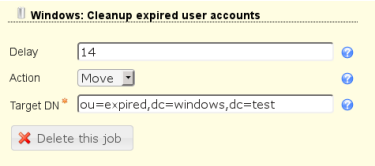


Table 3.6. Options

Option	Description
Delay	Number of days to wait after the account is expired.
Action	Delete or move accounts
Target DN	Move only: specifies the DN where accounts are moved

FreeRadius: Delete or move expired accounts

You can automatically delete or move expired accounts.

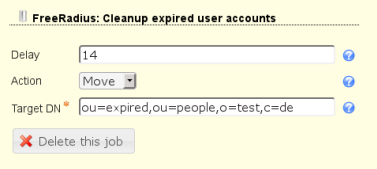


Table 3.7. Options

Option	Description
Delay	Number of days to wait after the account is expired.
Action	Delete or move accounts
Target DN	Move only: specifies the DN where accounts are moved

Qmail: Delete or move expired accounts

You can automatically delete or move expired accounts. The job reads the qmail deletion date of user accounts.

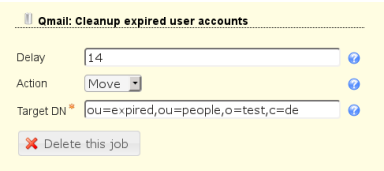
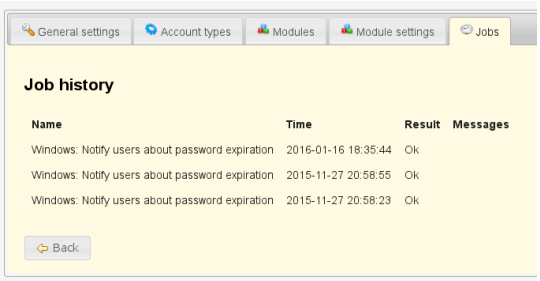


Table 3.8. Options

Option	Description
Delay	Number of days to wait after the account is expired.
Action	Delete or move accounts
Target DN	Move only: specifies the DN where accounts are moved

Job history

This will show the list of all executed job runs and their result.

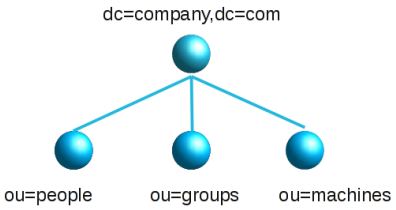


Typical scenarios

This is a list of typical scenarios how your LDAP environment may look like and how to structure the server profiles for it.

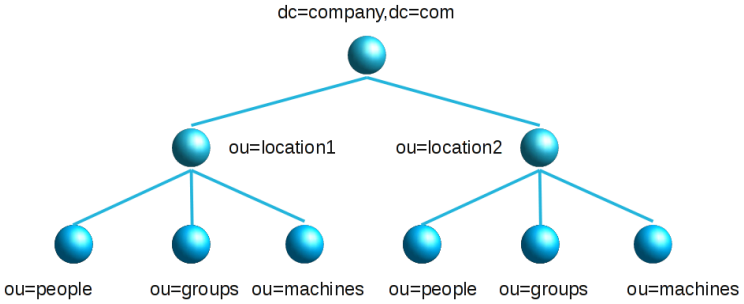
Simple: One LDAP directory managed by a small group of admins

This is the easiest and most common scenario. You want to manage a single LDAP server and there is only one or a few admins. In this case just create one server profile and you are done. The admins may be either specified as a fixed list or by using an LDAP search at login time.



Advanced: One LDAP server which is managed by different admin groups

Large organisations may have one big LDAP directory for all user/group accounts. But the users are managed by different groups of admins (e.g. departments, locations, subsidiaries, ...). The users are typically divided into organisational units in the LDAP tree. Admins may only manage the users in their part of the tree.

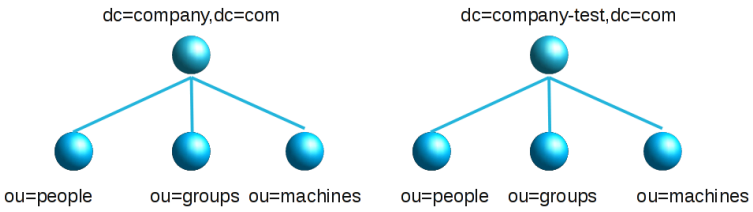


In this situation it is recommended to create one server profile for each admin group (e.g. department). Setup the LDAP suffixes in the server profiles to point to the needed organisational units. E.g. use ou=people,ou=department1,dc=company,dc=com or ou=department1,ou=people,dc=company,dc=com as LDAP suffix for users. Do the same for groups, hosts, ... This way each admin group will only see its own users. You may want to use LDAP search for the LAM login in this scenario. This will prevent that you need to update a server profile if the number of admins changes.

Attention: LAM's feature to automatically find free UIDs/GIDs for new users/groups will not work in this case. LAM uses the user/group suffix to search for already assigned UIDs/GIDs. As an alternative you can specify different UID/GID ranges for each department. Then the UIDs/GIDs will stay unique for the whole directory.

Multiple LDAP servers

You can manage as many LDAP servers with LAM as you wish. This scenario is similar to the advanced scenario above. Just create one server profile for each LDAP server.



Single LDAP directory with lots of users (>10 000)

LAM was tested to work with 10 000 users. If you have a lot more users then you have basically two options.

- Divide your LDAP tree in organisational units: This is usually the best performing option. Put your accounts in several organisational units and setup LAM as in the advanced scenario above.
- Increase memory limit: Increase the memory_limit parameter in your php.ini. This will allow LAM to read more entries. But this will slow down the response times of LAM.

Chapter 4. Managing entries in your LDAP directory

This chapter will give you instructions how to manage the different LDAP entries in your directory.

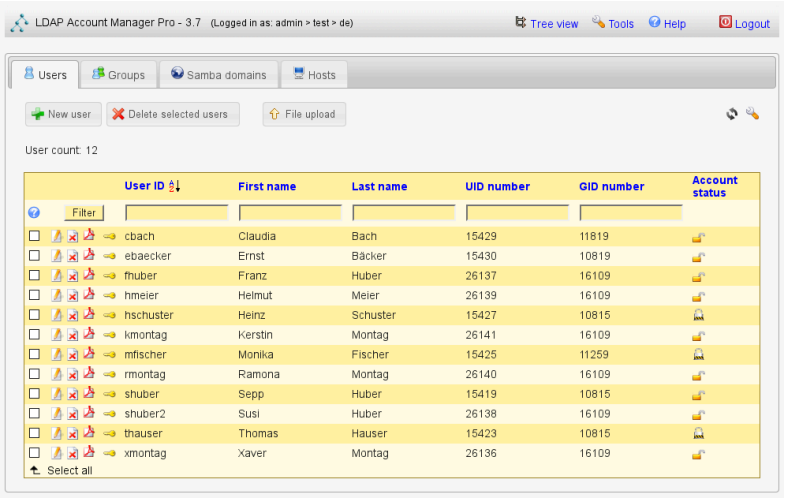
Please note that not all account types are manageable with the free LAM release. LAM Pro provides some more account types (e.g. group of names, aliases, ...) and modules (e.g. Kopano, custom scripts, ...) to support additional LDAP object classes. All LAM Pro features are marked in this manual.

Basic page layout:

After the login LAM will present you its main page. It consists of a header part which is equal for all pages and the content area which covers most the of the page.

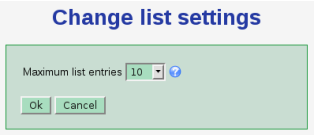
The header part includes the links to manage all account types (e.g. users and groups) and open the tree view (LDAP browser). There is also the logout link and a tools entry.

When you login the you will see an account listing in the content area.



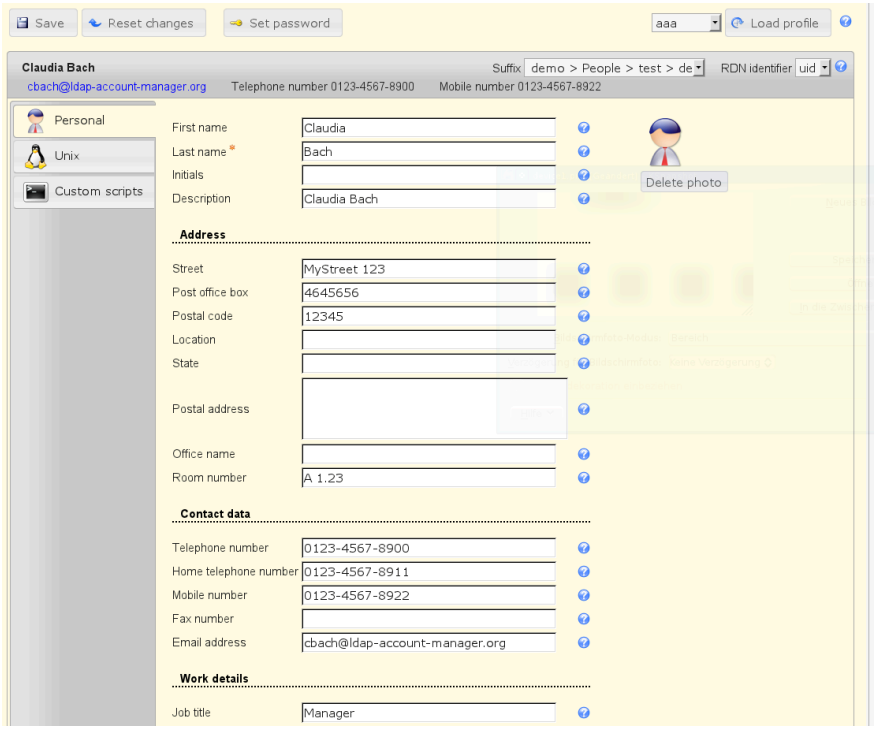
Here you can create, delete and modify accounts. Use the action buttons at the left or double click on an entry to edit it.

The suffix selection box allows you to list only the accounts which are located in a subtree of your LDAP directory.



You can change the number of shown entries per page with "Change settings". Depending on the account type there may be additional settings. E.g. the user list can convert group numbers to group names.

When you select to edit an entry then LAM will show all its data on a tabbed view. There is one tab for each functional part of the account. You can set default values by loading an account profile.



Typical usage scenarios

Here is a list of typical usage scenarios and what account types and modules you need to configure.

Address book entries:

Account types:

- Users (Personal)

Unix accounts:

Account types:

- Users (Personal + Unix)
- Groups (Unix (posixGroup))

Suse users may need to use Group (Group of names + Unix (rfc2307bisPosixGroup)) because of Suse's special LDAP schema.

Samba 3 accounts:

Account types:

- Users (Personal + User + Samba 3)
- Groups (Unix + Samba 3)
- Hosts (Account + Unix + Samba 3)
- Samba domains (Samba domain)

Samba 4/Active Directory:

Account types:

- Users (Windows)
- Groups (Windows)
- Hosts (Windows)

Please note that must change the attributes that are shown in the account lists. Otherwise, the account tables will show empty lines. See the documentation for the Windows user/group/host modules.

For Samba 4 with Kopano use the following modules:

- Users (Windows + Kopano (+ Kopano contact))
- Groups (Windows + Kopano)
- Hosts (Windows + Kopano)
- Kopano dynamic groups (Kopano dynamic group)
- Kopano address lists (Kopano address list)

See also the Kopano section for additional settings (e.g. using Kopano AD schema).

Asterisk:

Account types:

- Users (Personal + Asterisk)
- Asterisk extensions (Asterisk extension)

Kopano:

Account types:

- Users (Personal + Unix + Kopano (+ Kopano contact))
- Groups (Unix + Kopano)
- Kopano dynamic groups (Kopano dynamic group)
- Kopano address lists (Kopano address list)
- Hosts (Device + Kopano + IP Address)

PyKota:

Account types:

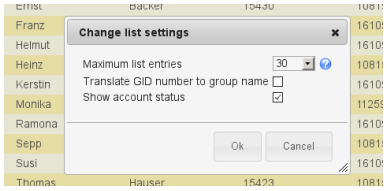
- Users (Personal + Unix + PyKota)
- Groups (Unix + PyKota)
- Printers (PyKota)
- Billing codes (PyKota)

Users

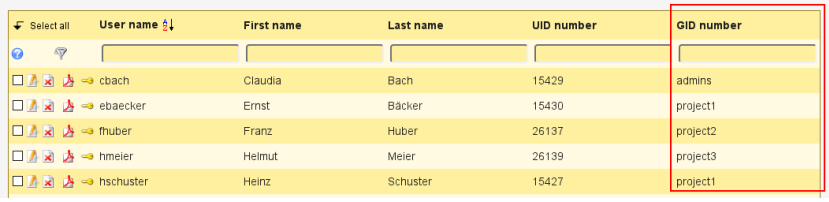
LAM manages various types of user accounts. This includes address book entries, Unix, Samba, Kopano and much more.

Account list settings:

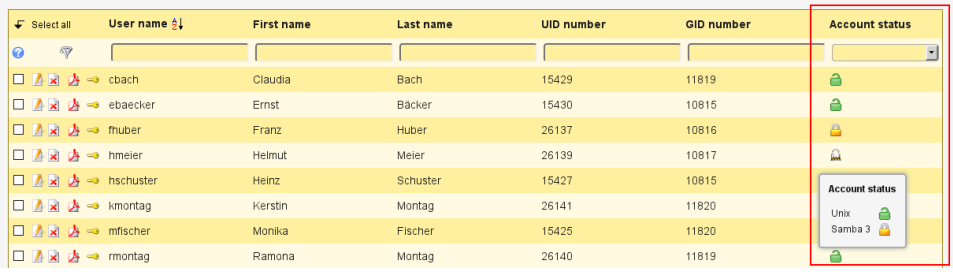
The user list includes two special options to change how your users are displayed.



Translate GID number to group name: By default the user list can show the primary group IDs (GIDs) of your users. There are often cases where it is more suitable to show the group name instead. This can be done by activating this option. Please note that LAM will execute more LDAP queries which may result in decreased performance.



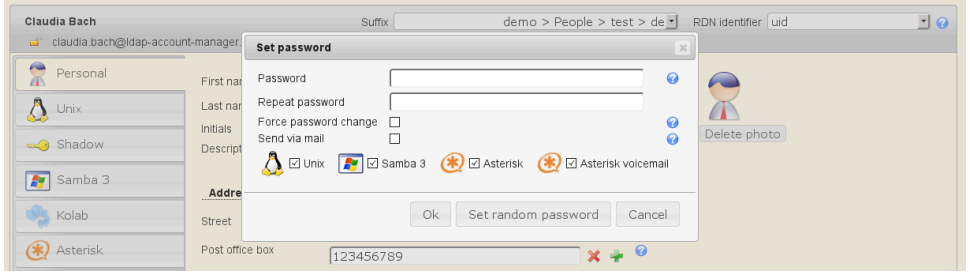
Show account status: If you activate this option then there will be an additional column displayed that shows if the account is locked or expired. You can see more details when moving the mouse cursor over the lock icon. This function supports Unix, Samba, PPolicy, Windows and 389ds locking+deactivation.



Password:

Click the "Set password" button to change the user's password(s). Depending on the active account modules LAM will offer to change multiple passwords at the same time.

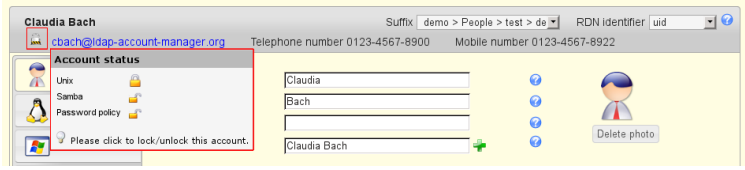
If a module supports to enforce a password change then you will see the appropriate checkbox. LAM Pro also offers to send the password via email after the account is saved. Email options are specified in your LAM server profile.



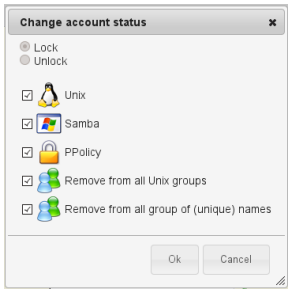
Quick account (un)locking:

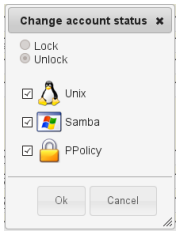
When you edit an user then LAM supports to quickly lock/unlock the whole account. This includes Unix, Samba and PPolicy. LAM can also remove group memberships if an account is locked.

You will see the current status of all account parts in the title area of the account.



If you click on the lock icon then a dialog will be opened to change these values. Depending on which parts are locked LAM will provide options to lock/unlock account parts.





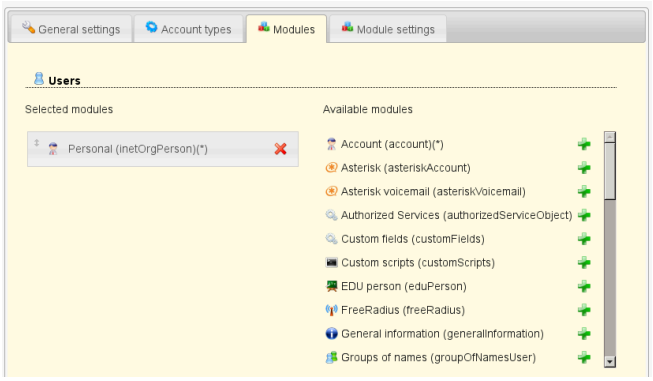
Personal

This module is the most common basis for user accounts in LAM. You can use it stand-alone to manage address book entries or in combination with Unix, Samba or other modules.

The Personal module provides support for managing various personal data of your users including mail addresses and telephone numbers. You can also add photos of your users (please install PHP Imagick/ImageMagick [http://www.php.net/manual/en/book.imagick.php] for full file format support). If you do not need to manage all attributes then you can deactivate them in your server profile.

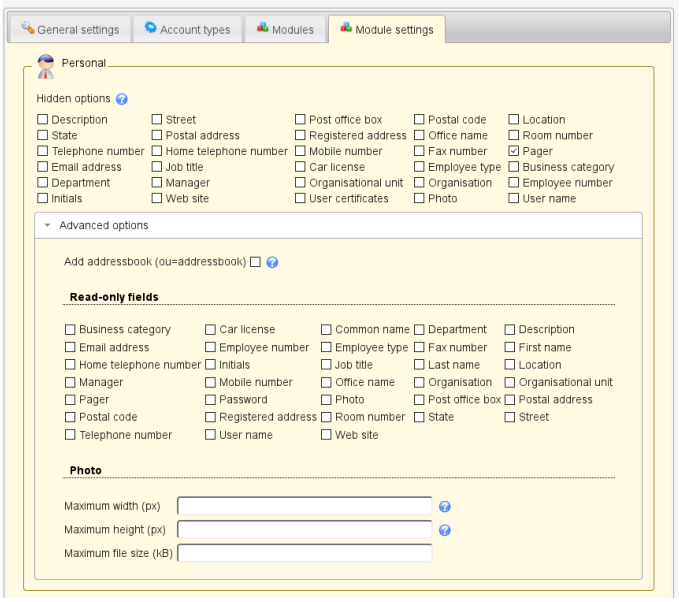
Configuration

Please activate the module "Personal (inetOrgPerson)" for users.

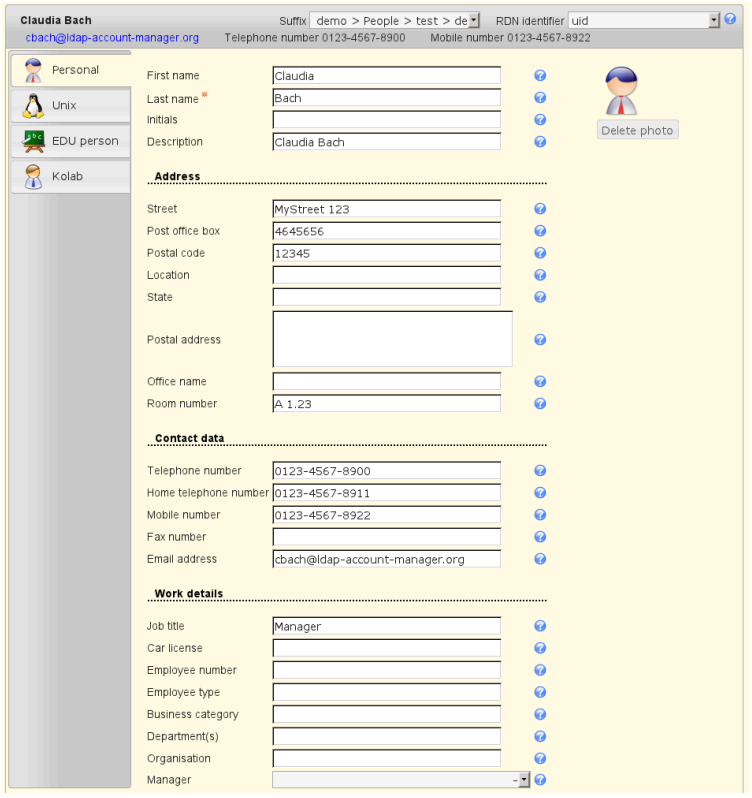


The module manages lots of fields. Probably, you will not need all of them. You can hide fields in module settings.

In advanced options you may also set fields to read-only (for existing accounts) and define limits for photo files. Additionally, you can add an "ou=addressbook" subentry to each user in case you manage user addressbooks.



User management



User certificates can be uploaded and downloaded. LAM will automatically convert PEM to DER format.

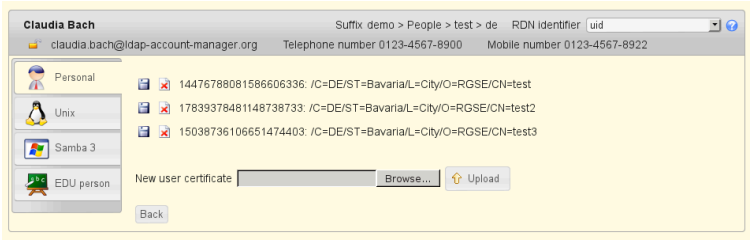


Table 4.1. LDAP attribute mappings

Attribute name	Name inside LAM
businessCategory	Business category
carLicense	Car license
cn/commonName	Common name
departmentNumber	Department(s)
description	Description
employeeNumber	Employee number
employeeType	Employee type
facsimileTelephoneNumber/fax	Fax number
givenName/gn	First name
homePhone	Home telephone number
initials	Initials
jpegPhoto	Photo
l	Location
labeledURI	Web site
mail/rfc822Mailbox	Email address
manager	Manager
mobile/mobileTelephoneNumber	Mobile number
organizationName/o	Organisation
ou	Organizational unit
pager	Pager number
physicalDeliveryOfficeName	Office name
postalAddress	Postal address
postalCode	Postal code
postOfficeBox	Post office box
registeredAddress	Registered address
roomNumber	Room number
sn/surname	Last name
st	State
street/streetAddress	Street
telephoneNumber	Telephone number
title	Job title
userCertificate	User certificates
uid/userid	User name
userPassword	Password

Wildcards

This module provides the following wildcards (others may be provided by other modules):

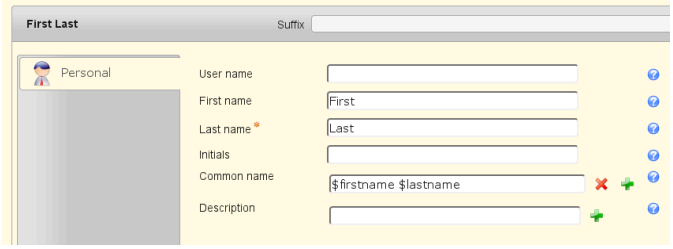
- $firstname: First name
- $lastname: Last name
- $user: User name

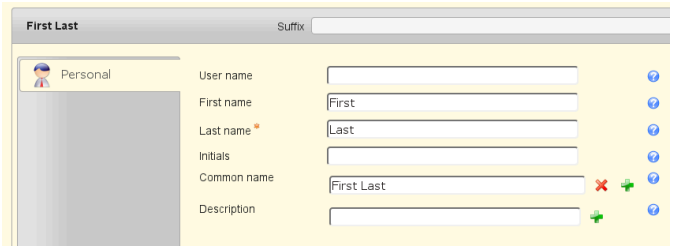
- $commonname: Common name
- $email: Email address

You can use them in the following input fields on user edit screen:

- Common name
- Description
- Mail
- Postal address
- Registered address
- Web site

Use this when some of your data always follows the same schema. E.g. using "$firstname $lastname" in common name field can be used like this to get "First Last". You can set the wildcards in profile editor so they are automatically applied for new users.





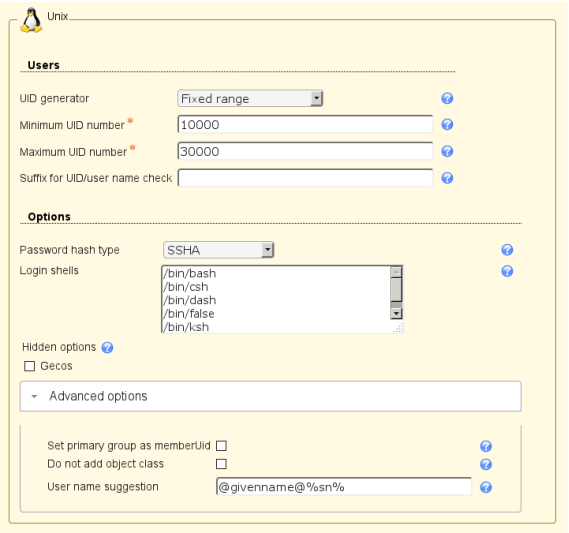
Unix

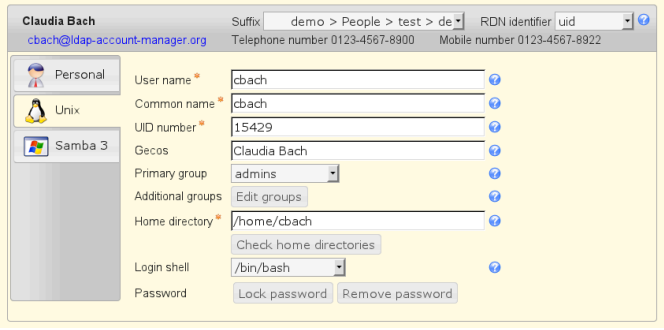
The Unix module manages Unix user accounts including group memberships.

There are several configuration options for this module:

- UID generator: LAM will suggest UID numbers for your accounts. Please note that it may happen that there are duplicate IDs assigned if users create accounts at the same time. Use an overlay [http://www.openldap.org/doc/admin24/overlays.html] like "Attribute Uniqueness" (example) if you have lots of LAM admins creating accounts.
  - Fixed range: LAM searches for free numbers within the given limits. LAM always tries to use a free UID that is greater than the existing UIDs to prevent collisions with deleted accounts.
  - Samba ID pool: This uses a special LDAP entry that includes attributes that store a counter for the last used UID/GID. Please note that this requires that you install the Samba schema and create an LDAP entry of object class "sambaUnixIdPool".
  - Magic number: Use this if your LDAP server assigns the UID numbers automatically (e.g. DNA by 389 server). Enter the server's magic number setting.

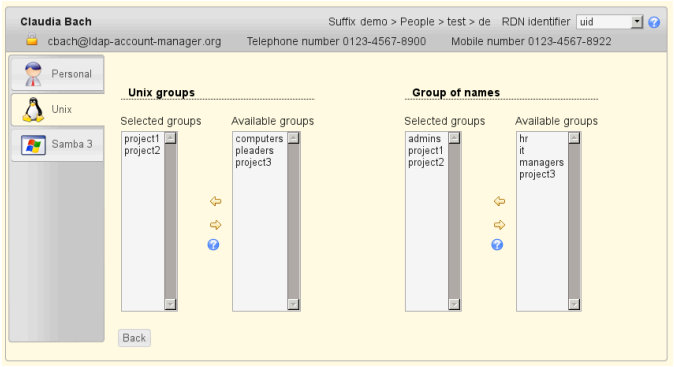
- Password hash type: If possible use CRYPT-SHA512 or SSHA to protect your user's passwords. The option SASL will set the password to "{SASL}<user name>".
- Login shells: List of valid login shells that can be selected when editing an account.
- Hidden options: Some input fields can be hidden to simplify the GUI if you do not need them.
- Set primary group as memberUid: By default primary group membership is not set on group objects but only on user (gidNumber). Activate this if you need to have the primary group membership in group object, too.
- Do not add object class: This is for Windows only. When the checkbox is activated then the posixAccount object class will not be added to a user.
- User name suggestion: The user name is automatically filled as specified in the configuration (default smiller for Steve Miller). Of course, the suggested value can be changed any time. Common name is also filled with first/last name by default.





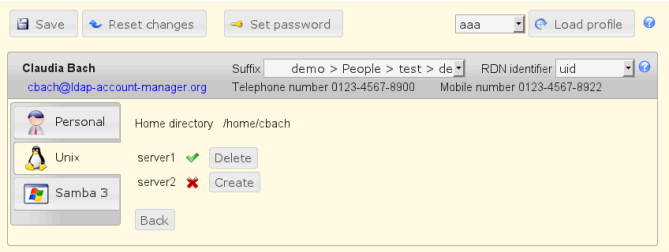
Group memberships can be changed when clicking on "Edit groups". Here you can select the Unix groups and group of names memberships.

To enable "Group of names" please either add the groups module "groupOfNames"/"groupOfUniqueNames" or add the account type "Group of names".



You can also create home directories for your users if you setup lamdaemon. This allows you to create the directories on the local or remote servers.

It is also possible to check the status of the user's home directories. If needed the directories can be created or removed at any time.



Wildcards

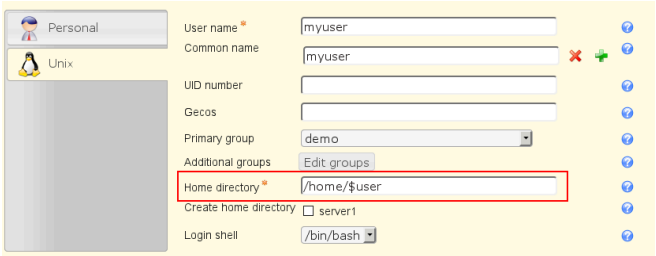
This module provides the following wildcards (others may be provided by other modules):

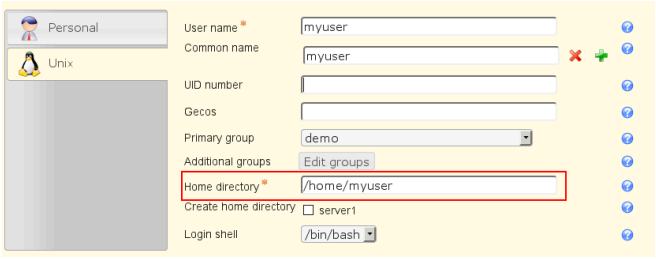
- $user: User name
- $group: Groupe name (not numeric number)

You can use them in the following input fields on user edit screen:

- Common name
- Gecos
- Home directory

Use this when some of your data always follows the same schema. E.g. using "/home/$user" in home directory field can be used like this to get "/home/myuser". You can set the wildcards in profile editor so they are automatically applied for new users.





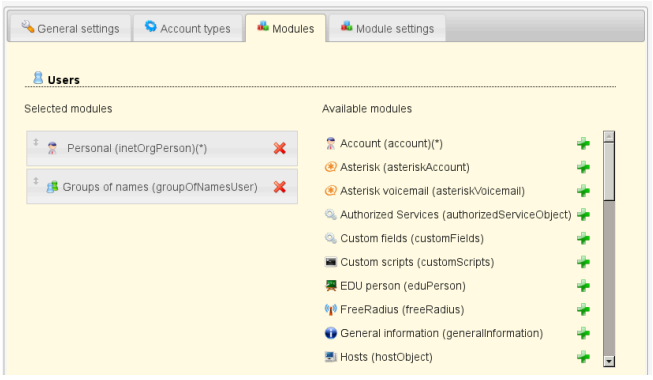
Group of names and group of members (LAM Pro)

This module manages memberships in group of (unique) names and also group of members.

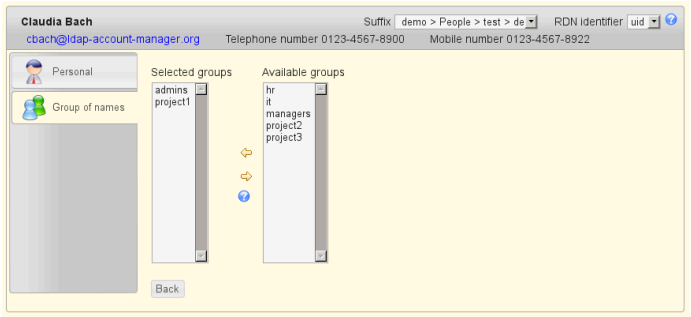
Please note that this module cannot be used if the Unix module is active. In this case group memberships may be managed with the Unix module.

Configuration

To activate this feature please add the user module "Group of names (groupOfNamesUser)" to your LAM server profile.

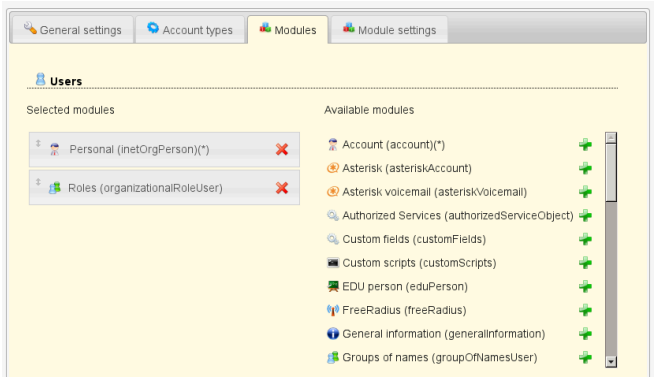


The module automatically detects if groups are based on "groupOfNames", "groupOfUniqueNames" or "groupOfMembers" and sets the correct attribute.



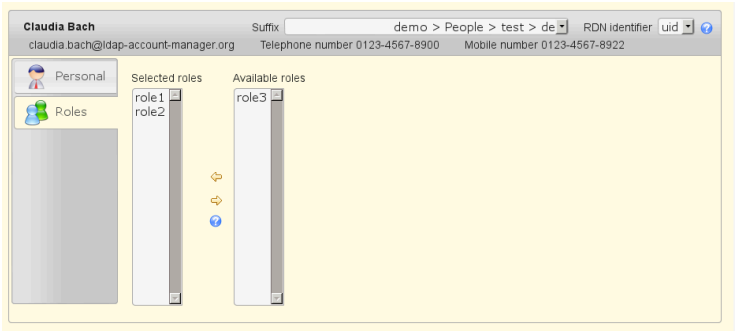
Organizational roles (LAM Pro)

LAM can manage role memberships in organizationalRole objects. To activate this feature please add the user module "Roles (organizationalRoleUser)" to your LAM server profile.



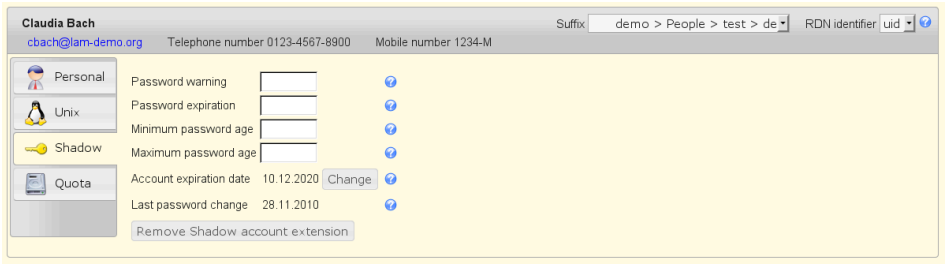
User editing

Now, there will be a new tab "Roles" when you edit your user accounts. Here you can select the role memberships.



Shadow

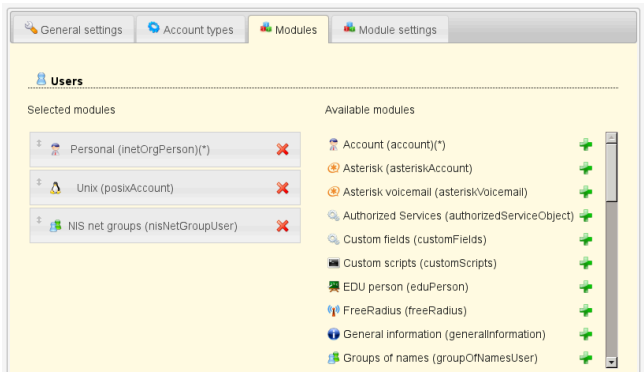
LAM supports the management of the LDAP substitution of /etc/shadow. Here you can setup password policies for your Unix accounts and also view the last password change of a user.



NIS net groups

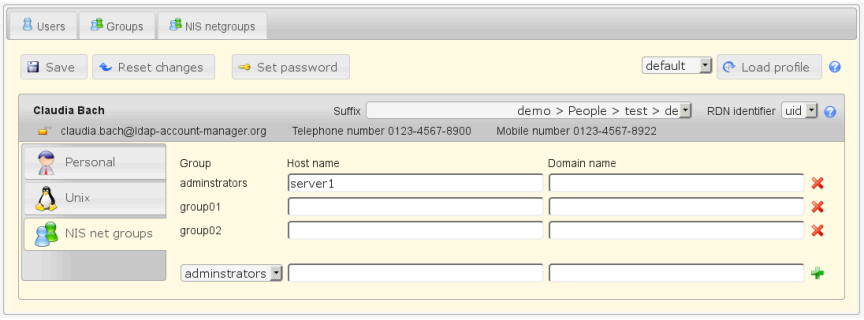
Configuration

Please add the module "NIS net groups (nisNetGroupUser)" to the list of active user modules.



User editing

You will now see a new tab when editing users. Here you can assign memberships in NIS net groups and also set host/domain.



Password self reset (LAM Pro)

LAM Pro allows your users to reset their passwords by answering a security question. The reset link is displayed on the self service page. Additionally, you can set question + answer in the admin interface.

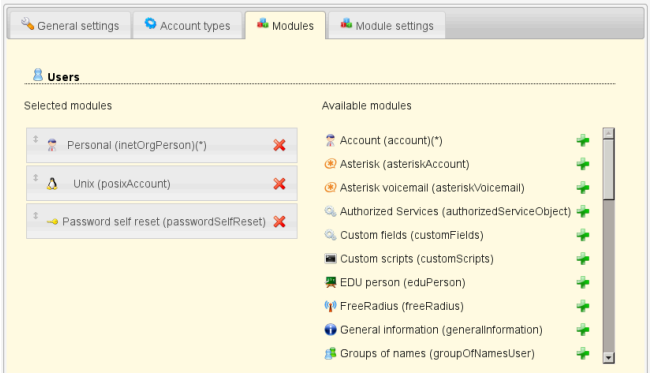
Please note that self service and LAM admin interface are separated functionalities. You need to specify the list of possible security questions in both self service profile(s) and server profile(s).

Schema installation

Please install the LDAP schema as described here.

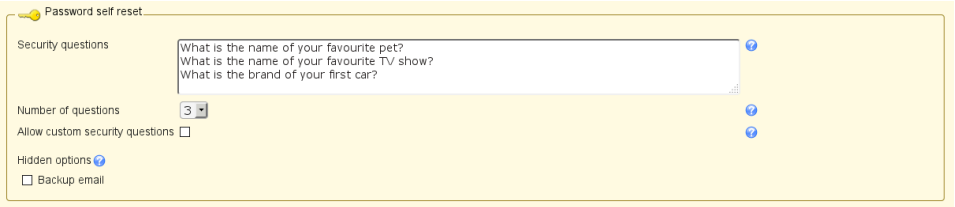
Activate password self reset module

Please activate the password self reset module in your LAM Pro server profile.



Now select the tab "Module settings" and specify the list of possible security questions. Only these questions will be selectable when you later edit accounts unless you explicitly allow to enter custom questions. LAM Pro supports to set up to three security questions per user.

If you do not want to set backup email addresses then you can hide this option.



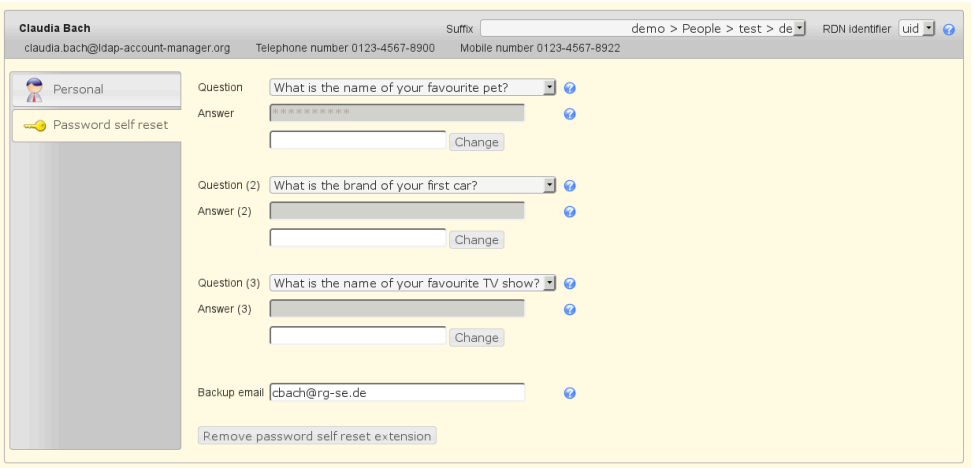
Edit users

After everything is setup please login to LAM Pro and edit your users. You will see a new tab called "Password self reset". Here you can activate/remove the password self reset function for each user. You can also change the security question and answer.

If you set a backup email address then confirmation emails will also be sent to this address. This is useful if the user password grants access to the user's primary mailbox. So passwords can be unlocked with an external email address.

Hint: You can add the passwordSelfReset object class to all your users with the multi edit tool.

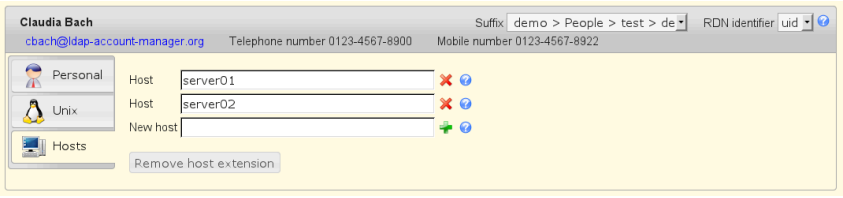
Samba 4 note: Due to a bug [https://bugzilla.samba.org/show_bug.cgi?id=10094] in Samba 4 you need to add the extension, save, and then select a question and set the answer. If you add the extension, set question/answer and then save all together this will cause an LDAP error and no changes will be saved.



Hosts

You can specify a list of valid host names where the user may login. If you add the value "*" then the user may login to any host. This can be further restricted by adding explicit deny entries which are prefixed with "!" (e.g. "!hr_server").

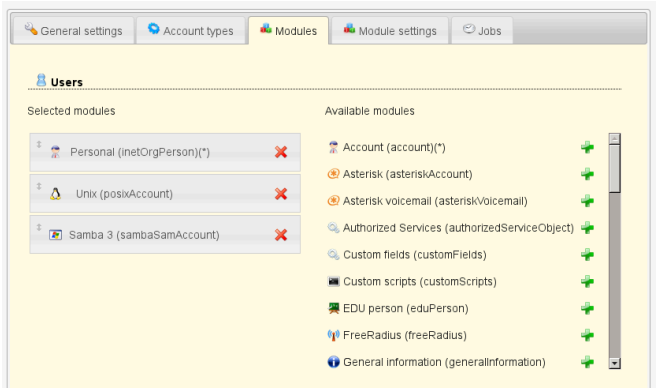
Please note that your PAM settings need to support host restrictions. This feature is enabled by setting **pam_check_host_attr yes** in your **/etc/pam_ldap.conf**. When it is enabled then the account facility of pam_ldap will perform the checks and return an error when no proper host attribute is present. Please note that users without host attribute cannot login to such a configured server.



Samba 3

LAM supports full Samba 3 user management including logon hours and terminal server options.

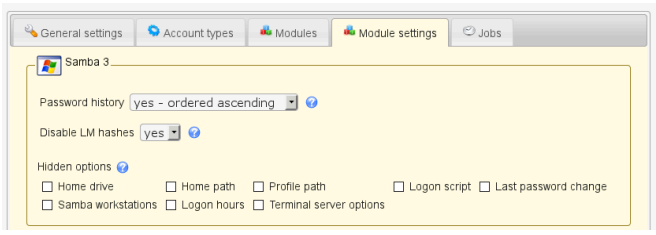
The module is enabled by adding "Samba 3 (sambaSamAccount)" to your user modules.



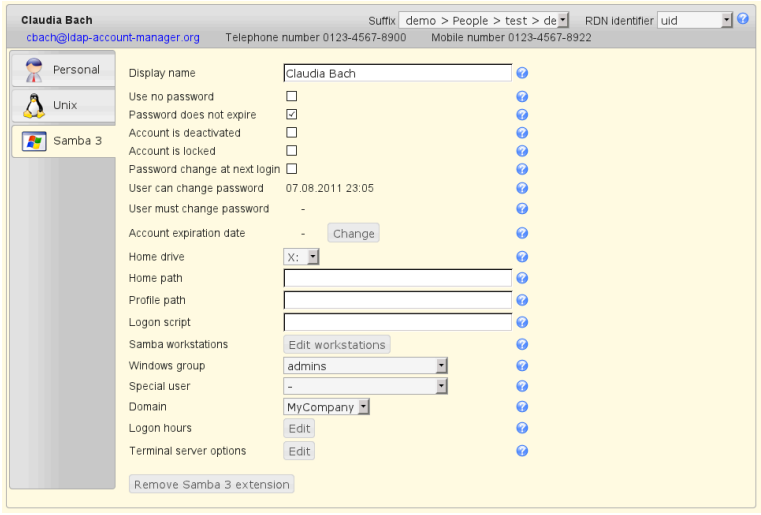
In the configuration options you can enable password history checking. Depending on your LDAP server you might need ascending or descending order. Just switch the setting if the password history is not correctly updated.

In case you have no very old Windows clients (e.g. Windows 98) it is recommended to disable LM hashes. They are considered to be insecure.

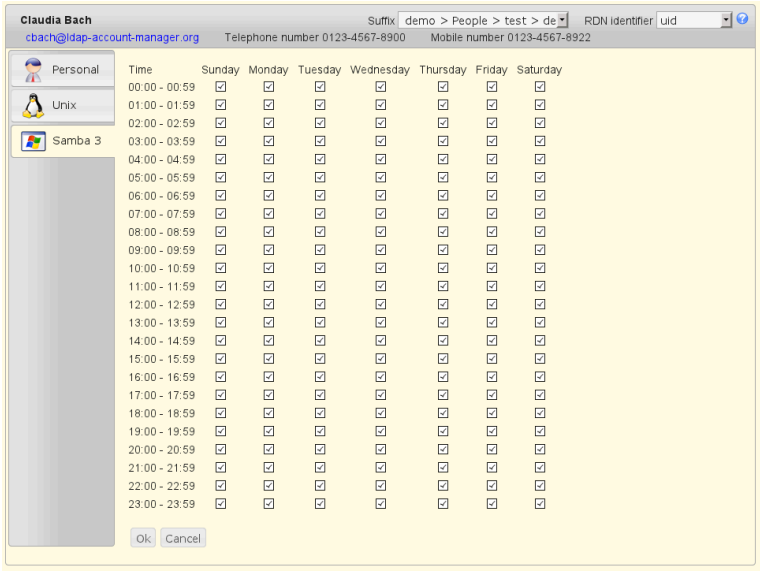
You can also hide some input fields if you do not need them.



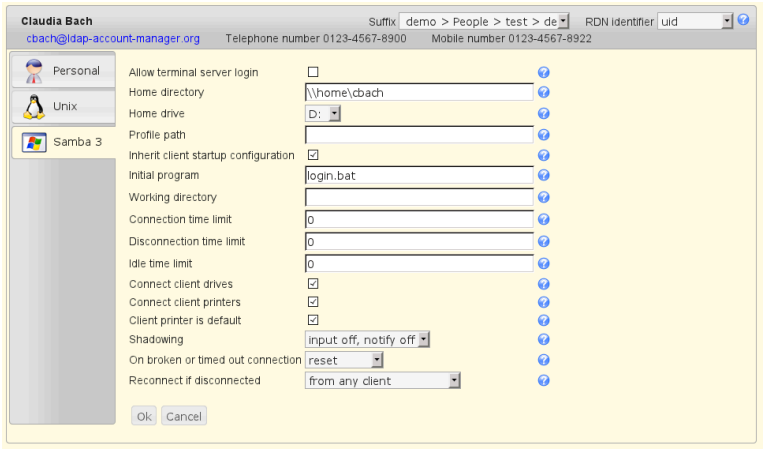
After configuring the module you will see the Samba 3 tab when you edit a user.



Logon hours can be changed.

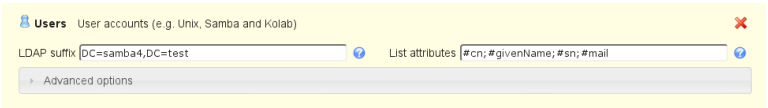


You can also setup terminal server settings.

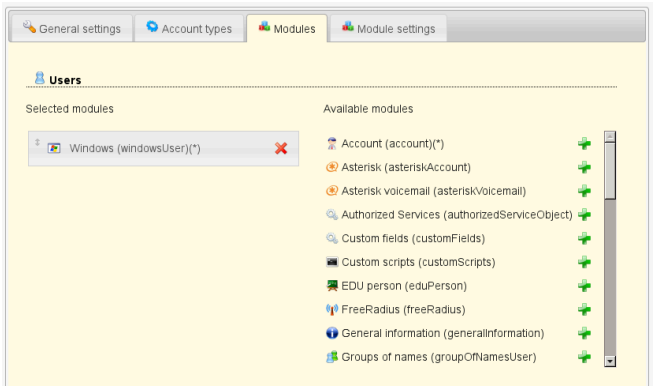


Windows (Samba 4)

Please activate the account type "Users" in your LAM server profile and then add the user module "Windows (windowsUser)(*)".

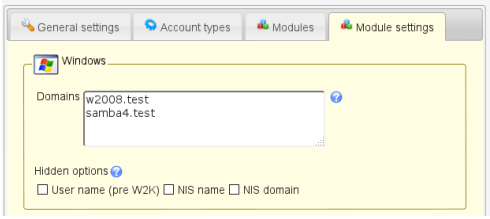


The default list attributes are for Unix and not suitable for Windows (blank lines in account table). Please use "#cn;#givenName;#sn;#mail" or select your own attributes to display in the account list.



On tab "Module settings" you can specify the possible Windows domain names and if pre-Windows 2000 user names should be managed.

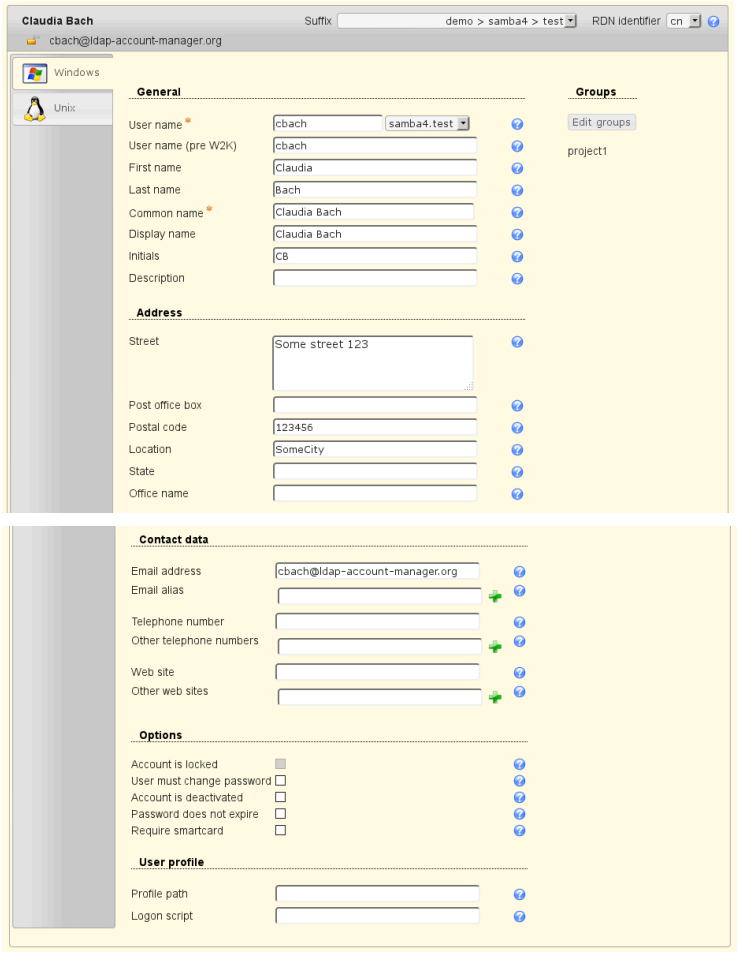
NIS support is deactivated by default. Enable it if needed.



Now you can manage your Windows users and e.g. assign groups. You might want to set the default domain name in the profile editor.

Attention:

- Password changes require a secure connection via ldaps://. Check your LAM server profile if password changes are refused by the server.
- Your server must run a 64bit operating system. Otherwise, the module might not work.



Wildcards

This module provides the following wildcards (others may be provided by other modules):

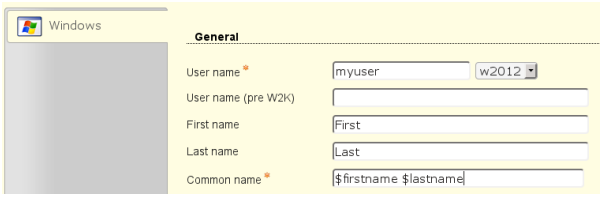
- $firstname: First name

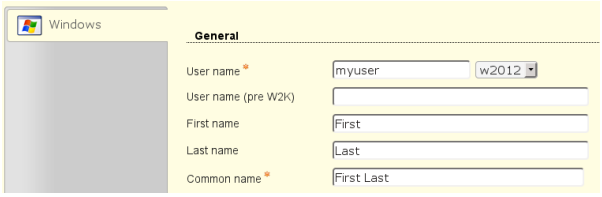
- $lastname: Last name
- $user: User name
- $commonname: Common name
- $email: Email address

You can use them in the following input fields on user edit screen:

- Common name
- Display name
- Email
- Email alias
- Home directory
- Profile path
- Script path

Use this when some of your data always follows the same schema. E.g. using "$firstname $lastname" in common name field can be used like this to get "First Last". You can set the wildcards in profile editor so they are automatically applied for new users.



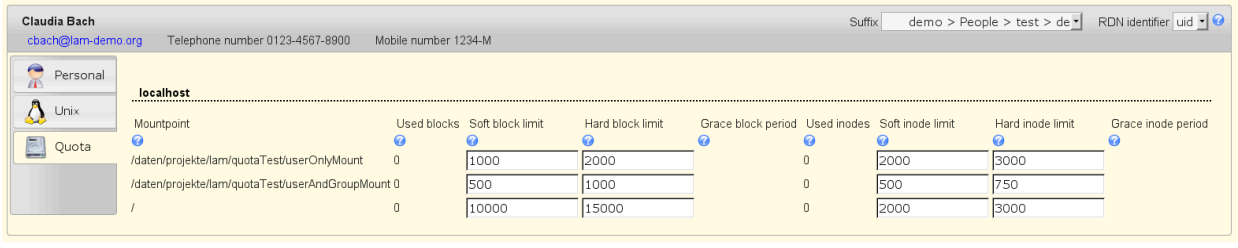


Filesystem quota (lamdaemon)

You can manage file system quotas with LAM. This requires to setup lamdaemon. LAM connects to your server via SSH and manages the disk filesystem quotas. The quotas are stored directly on the filesystem. This is the default mechanism to store quotas for most systems.

Please add the module "Quota (quota)" for users to your LAM server profile to enable this feature.

If you store the quota information directly inside LDAP please see the next section.

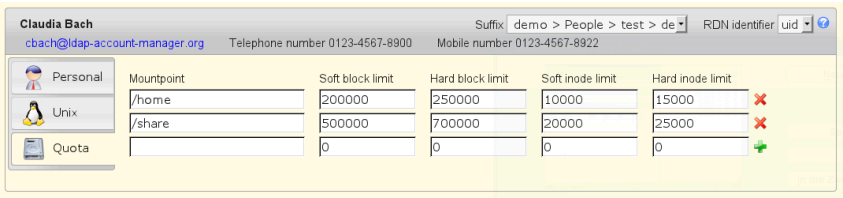


Filesystem quota (LDAP)

You can store your filesystem quotas directly in LDAP. See Linux DiskQuota [http://sourceforge.net/projects/linuxquota/] for details since it requires quota tools that support LDAP. You will need to install the quota LDAP schema to manage the object class "systemQuotas".

Please add the module "Quota (systemQuotas)" for users to your LAM server profile to enable this feature.

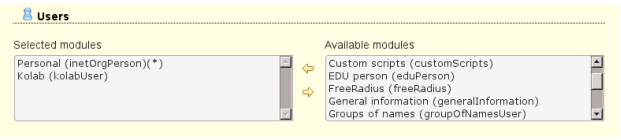
If you store the quota information on the filesystem please see the previous section.



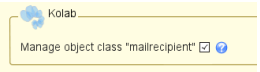
Kolab

This module supports to manage Kolab accounts with LAM. E.g. you can set the user's mail quota and define invitation policies.

Please add the Kolab user module in your LAM server profile to activate Kolab support.



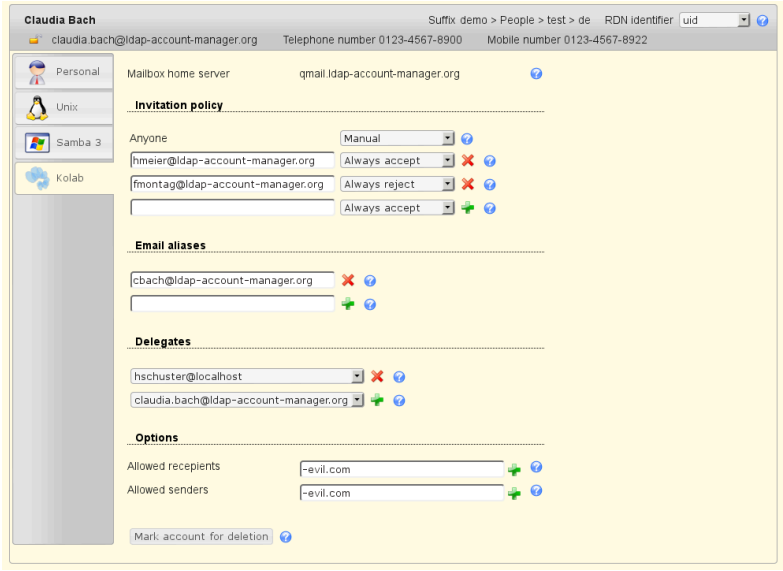
Attention: LAM will add the object class "mailrecipient" by default. This object class is available on 389 directory server but may not be present on e.g. OpenLDAP. Please deactivate the following setting (LAM server profile, module settings) if you do not use this object class.



Please enter an email address at the Personal page and set a Unix password first. Both are required that Kolab accepts the accounts. The email address ("Personal" page) must match your Kolab domain, otherwise the account will not work.

Attention: The mailbox server cannot be changed after the account has been saved. Please make sure that the value is correct.

Kolab users should not be directly deleted with LAM. You can mark an account for deletion which then is done by the Kolab server itself. This makes sure that the mailbox etc. is also deleted.



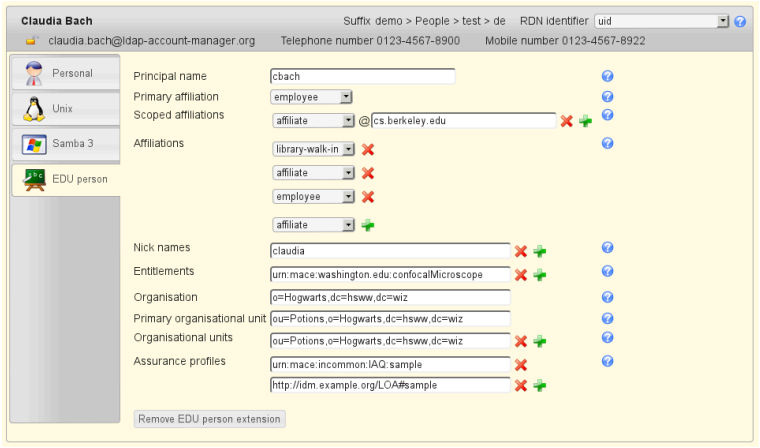
If you upgrade existing non-Kolab accounts please make sure that the account has an Unix password.

Asterisk

LAM supports Asterisk accounts, too. See the Asterisk section for details.

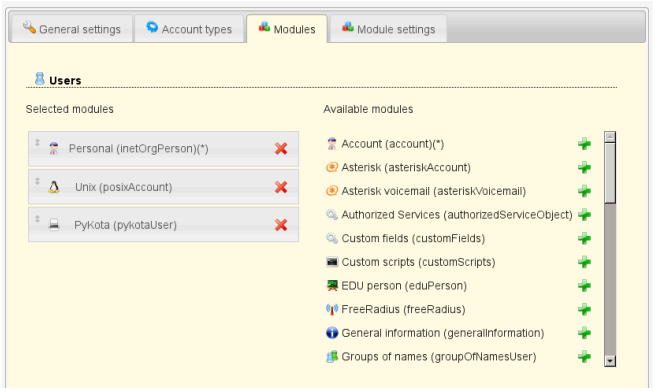
EDU person

EDU person accounts are mainly used in university networks. You can specify the principal name, nick names and much more.

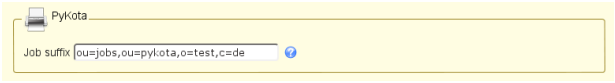


PyKota

There are two LAM user modules depending if your user entries should be built on object class "pykotaObject" or a different structural object class (e.g. "inetOrgPerson"). For "pykotaObject" please select "PyKota (pykotaUserStructural(*))" and "PyKota (pykotaUser)" in all other cases.

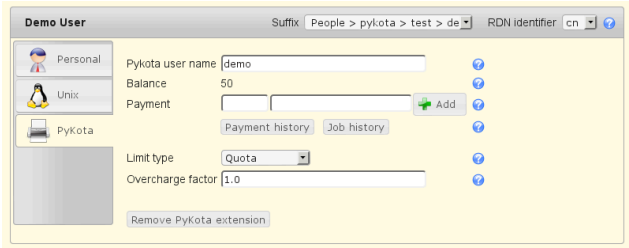


To display the job history please setup the job DN on tab "Module settings":

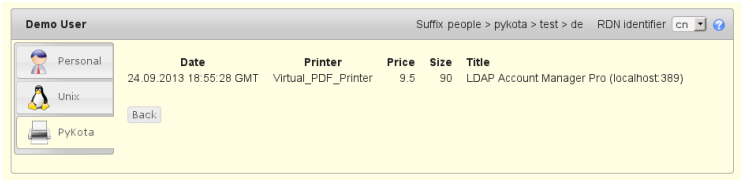


Now you can add the PyKota extension to your user accounts. Here you can setup the printing options and add payments for this user.

For LAM Pro there are also self service fields to allow users e.g. to view their current balance and job history.



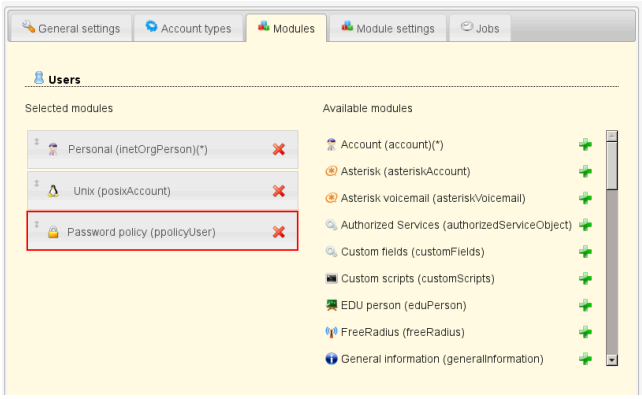
You may also view the payment and job history.



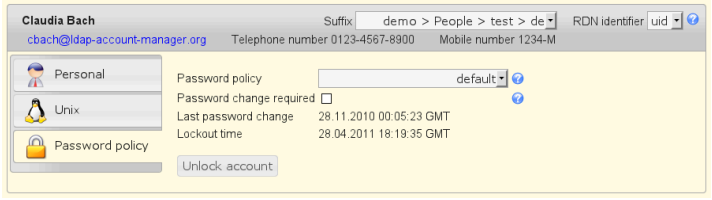
Password policy (LAM Pro)

OpenLDAP supports the ppolicy [http://linux.die.net/man/5/slapo-ppolicy] overlay to manage password policies for LDAP entries. LAM Pro supports managing the policies and assigning them to user accounts.

Please add the account type "Password policies" to your LAM server profile and activate the "Password policy" module for the user type.



You can select the password policy and force a password change on next login. Accounts can also be (un)locked.



You can assign any password policy which is found in the LDAP suffix of the "Password policies" type. When you set the policy to "default" then OpenLDAP will use the default policy as defined in your slapd.conf file.

Attention: Locking and unlocking requires that you also activate the option "Lockout users" in the assigned password policy. Otherwise, it will have no effect.

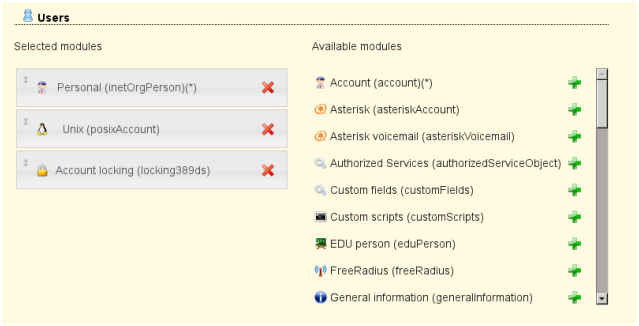
Account locking for 389ds (LAM Pro)

This module allows you to display if users are locked by 389ds server. You can (de)activate your users. The password expiration time can also be managed.

Requirements: 389ds LDAP server

Configuration

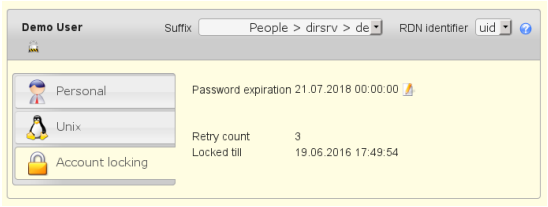
Please add the user module "Account locking (locking389ds)".



This will show the password expiration time. You can edit the value if needed.

If there are any failed login attempts then LAM displays their number and till when the user is locked by the system.

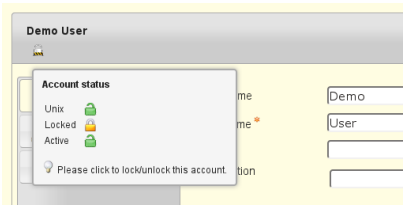
The limit of failed login attempts and lockout duration is configured on your LDAP server and not within LAM.



You can unlock the user by clicking on the lock icon.

Here you can also (de)activate the account.

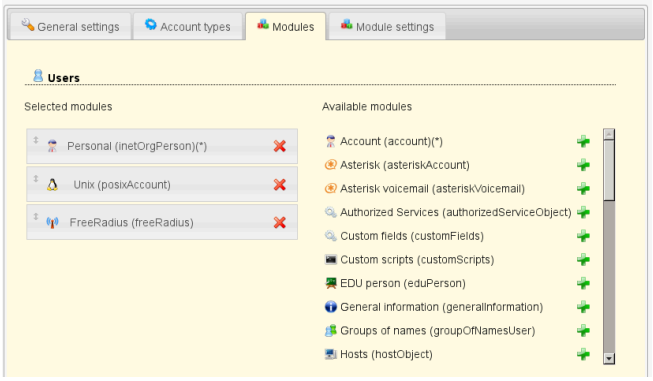
Note: Accounts are only locked by the LDAP server due to failed password attempts. You cannot manually lock an account. Deactivate it in case you want to disable login for a user.



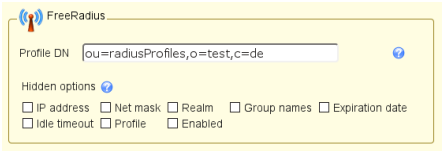
FreeRadius

FreeRadius is a software that implements the RADIUS authentication protocol. LAM allows you to mange several of the FreeRadius attributes.

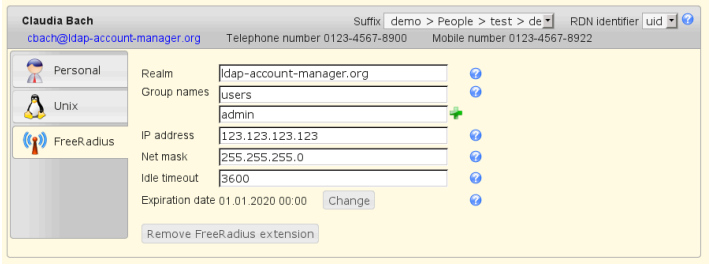
To activate the FreeRadius plugin please activate the FreeRadius user module in your server profile:



You can disable unneeded fields on the tab "Module settings". Here you can also set the DN where your Radius profile templates are stored if you use the option "Profile".



Now you will see the tab "FreeRadius" when editing users. The extension can be (de)activated for each user. You can setup e.g. realm, IP and expiration date.



Heimdal Kerberos (LAM Pro)

You can manage your Heimdal Kerberos accounts with LAM Pro. Please add the user module "Kerberos (heimdalKerberos)" to activate this feature.

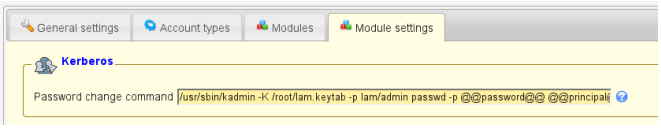
Setup password changing

LAM Pro cannot generate the password hashes itself because Heimdal uses a propietary format for them. Therefore, LAM Pro needs to call e.g. kadmin to set the password.

The wildcards @@password@@ and @@principal@@ are replaced with password and principal name. Please use keytab authentication for this command since it must run without any interaction.

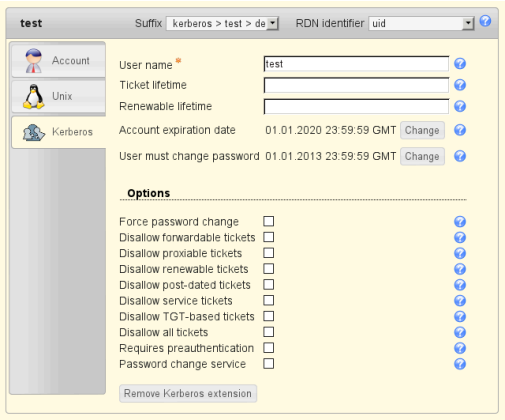
Example to create a keytab: ktutil -k /root/lam.keytab add -p lam@LAM.LOCAL -e aes256-cts-hmac-sha1-96 -V 1

Security hint: Please secure your LAM Pro server since the new passwords will be visible for a short term in the process list during password change.



User management

You can specify the principal/user name, ticket lifetimes and expiration dates. Additionally, you can set various account options.



MIT Kerberos (LAM Pro)

You can manage your MIT Kerberos accounts with LAM Pro. Please add the user module "Kerberos (mitKerberos)" to activate this feature. If you want to manage entries based on the structural object class "krbPrincipal" please use "Kerberos (mitKerberosStructural)" instead.

Setup password changing

LAM Pro cannot generate the password hashes itself because MIT uses a propietary format for them. Therefore, LAM Pro needs to call kadmin/kadmin.local to set the password.

LAM will add "-q 'cpw -pw PASSWORD PRINCIPAL'" to the command to set the password. Please use keytab authentication for this command since it must run without any interaction.

Keytabs may be created with the "ktutil" application.

Security hint: Please secure your LAM Pro server since the new passwords will be visible for a short term in the process list during password change.

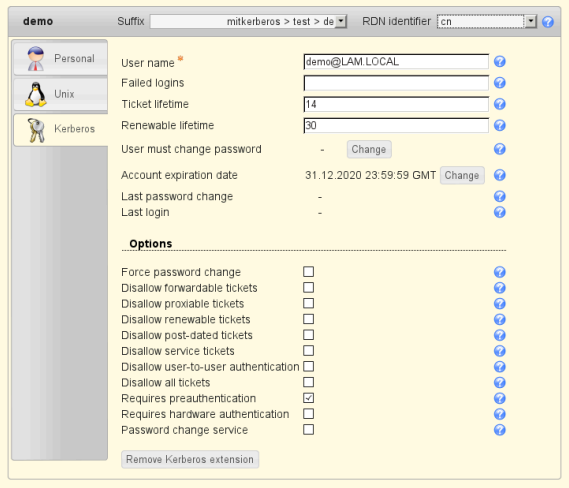
Please note that kadmin/kadmin.local often returns a successful command even if errors occured (e.g. password policy violations). You need to test this before and if affected then write a wrapper script arround kadmin that returns non-zero return codes for errors.

Example commands:

- /usr/sbin/kadmin -k -t /home/www-data/apache.keytab -p realm/changepwd
- sudo /usr/sbin/kadmin.local

User management

You can specify the principal/user name, ticket lifetimes and expiration dates. Additionally, you can set various account options.

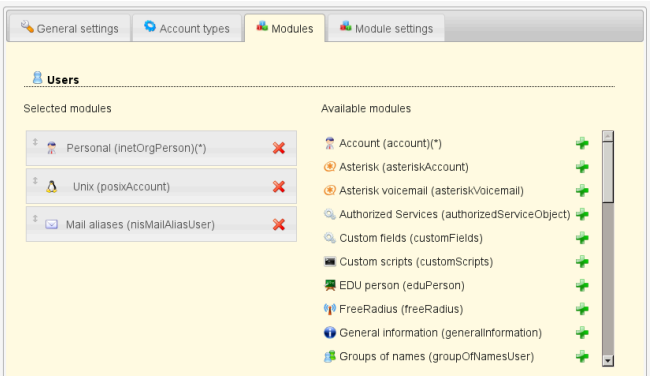


NIS mail aliases

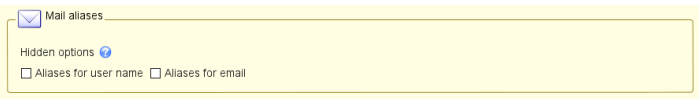
This module allows to add/remove the user in mail alias entries.

Note: You need to activate the mail alias type for this module.

To activate mail aliases for users please select the module "Mail aliases (nisMailAliasUser)":

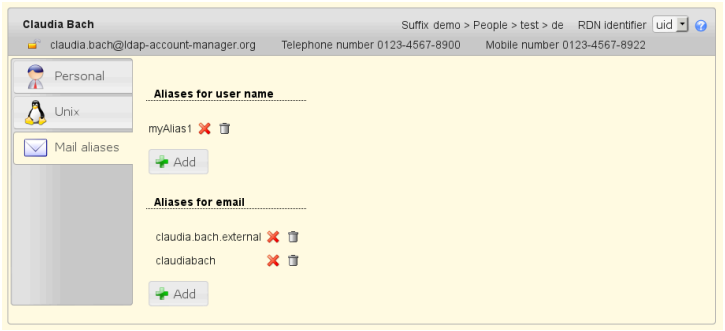


On tab Module settings you can select if you want to set the user name or email as recipient in alias entries.

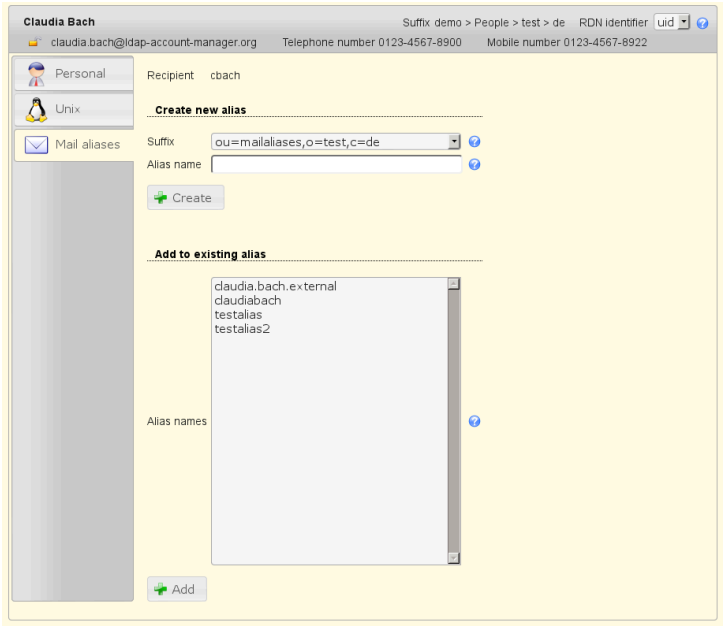


Now you will see the mail aliases tab when editing an user.

The red cross will only remove the user from the alias entry. If you click the trash can button then the whole alias entry (which may contain other users) will be deleted.



You can add the user to existing alias entries or create completly new ones.

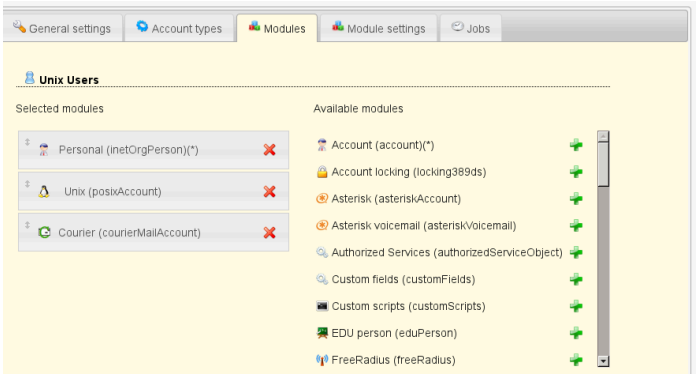


Courier mail

This module allows to add/remove the Courier extension for users.

Configuration:

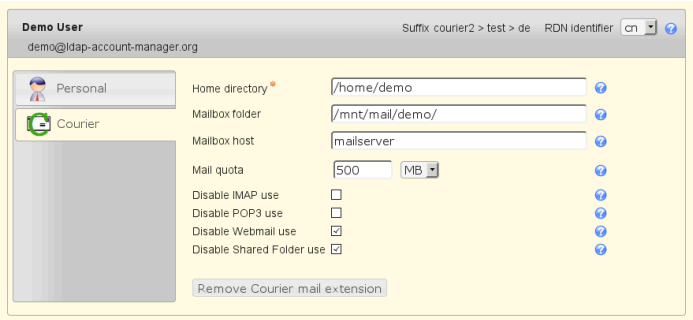
Please activate the module Courier for users to enable this extension. The Unix module is optional.



Usage:

Your user tab will now show the Courier extension. This can be added/removed any time.

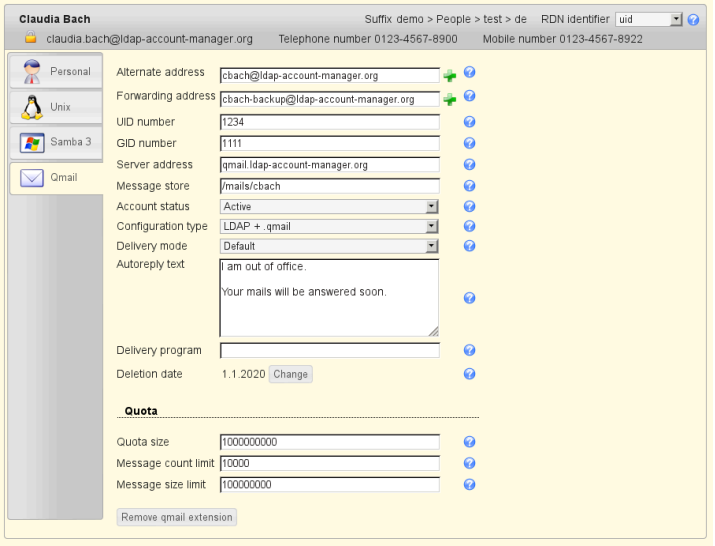
Here you can configure the home directory in case the Unix module is not activated. Additionally, mailbox folder, quota, server and feature flags can be configured.



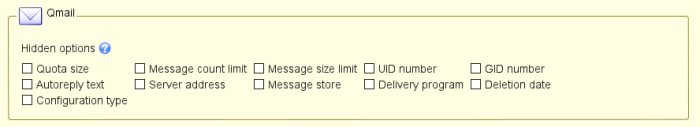
Qmail (LAM Pro)

LAM Pro manages all qmail attributes for users. This includes mail addresses, ID numbers and quota settings.

Please note that the main mail address is managed on tab "Personal" if this module is active. Otherwise, it will be on the qmail tab.



You can hide several qmail options if you do not want to manage them with LAM. This can be done on the module settings tab of your LAM server profile.

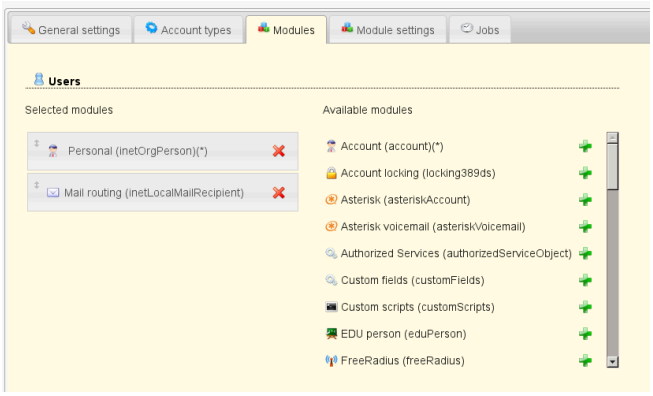


Mail routing

LAM supports to manage mail routing for user accounts.

Module activation:

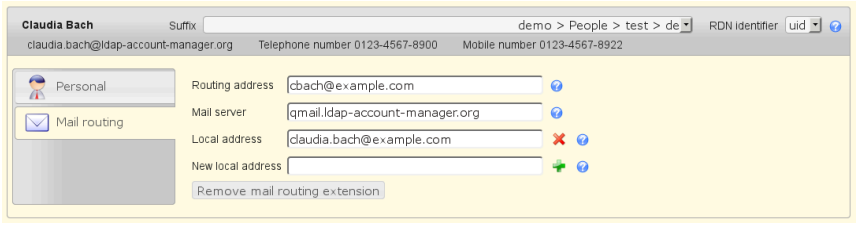
This feature can be activated by adding the "Mail routing" module to the user account type in your server profile.



Usage:

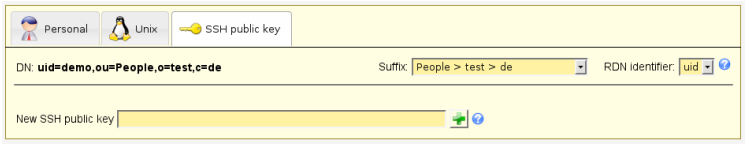
You can specify a routing address, the mail server and a number of local addresses to route.

In case you want to add this extension by default for new users there is an option in profile editor.



SSH keys

You can manage your public keys for SSH in LAM if you installed the LPK patch for SSH [http://code.google.com/p/openssh-lpk/]. Activate the "SSH public key" module for users in the server profile and you can add keys to your user entries.

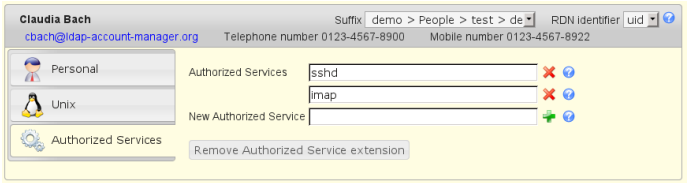


Authorized services

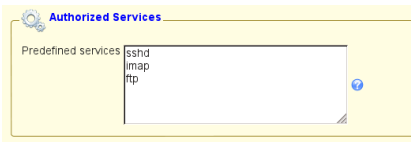
You can setup PAM to check if a user is allowed to run a specific service (e.g. sshd) by reading the LDAP attribute "authorizedService". This way you can manage all allowed services via LAM.

To activate this PAM feature please setup your **/etc/libnss-ldap.conf** and set "pam_check_service_attr" to "yes".

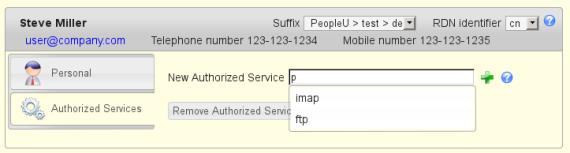
Inside LAM you can now set the allowed services. You may also setup default services in your account profiles.



You can define a list of services in your LAM server profile that is used for autocompletion.



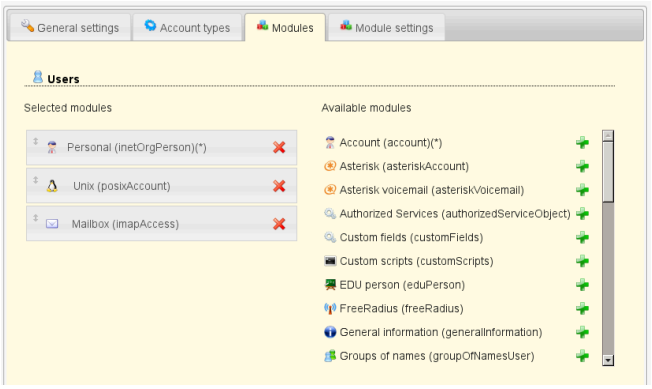
The autocompletion will show all values that contains the entered text. To display the whole list you can press backspace in the empty input field. Of course, you can also insert a service name that is not in the list.



IMAP mailboxes

LAM may create and delete mailboxes on an IMAP server for your user accounts. You will need an IMAP server that supports either SSL or TLS for this feature.

To activate the mailbox management module please add the "Mailbox (imapAccess)" module for the type user in your LAM server profile:



Now configure the module on the tab "Module settings". Here you can specify the IMAP server name, encryption options, the authentication for the IMAP connection and the valid mail domains. LAM can use either your LAM login password for the IMAP connection or display a dialog where you need to enter the password. It is also possible to store the admin password in your server profile. This is not recommended for security reasons.

The user name can either be a fixed name (e.g. "admin") or it can be generated with LDAP attributes of the LAM admn user. E.g. uid will be transformed to "myUser" if you login with "uid=myUser,ou=people,dc=example,dc=com".

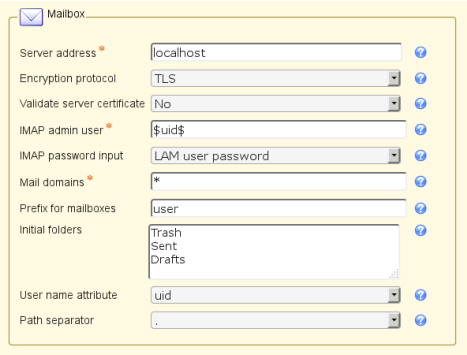
The mail domains specify for which accounts mailboxes may be created/deleted. E.g. if you enter "lam-demo.org" then mailboxes can be managed for "user@lam-demo.org" but not for "user@example.com". Use "*" for any domain.

You need to install the SSL certificate of the CA that signed your server certificate. This is usually done by installing the certificate in /etc/ssl/certs. Different Linux distributions may offer different ways to do this. For Debian please copy the certificate in "/usr/local/share/ca-certificates" and run "update-ca-certificates" as root.

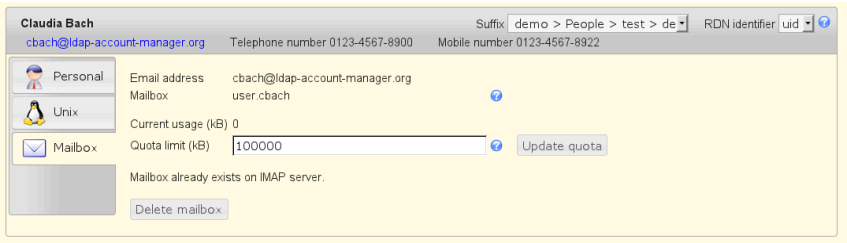
It is not recommended to disable the validation of IMAP server certificates.

The prefix, user name attribute and path separator specifies how your mailboxes are named (e.g. "user.myUser@localhost" or "user/myUser"). Select the values depending on your IMAP server settings.

You can specify a list of initial folder names to create for new mailboxes. LAM will then create them with each new mailbox.



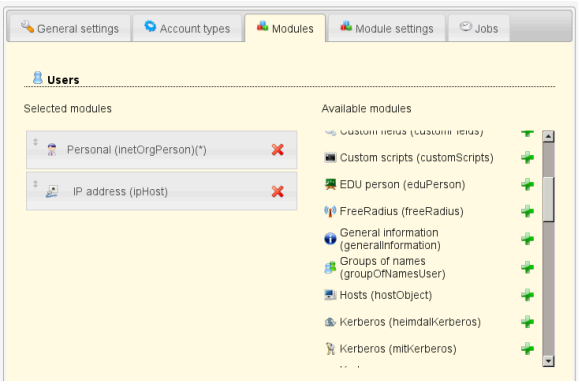
When you edit an user account then you will now see the tab "Mailbox". Here you can create/delete the mailbox for this user.



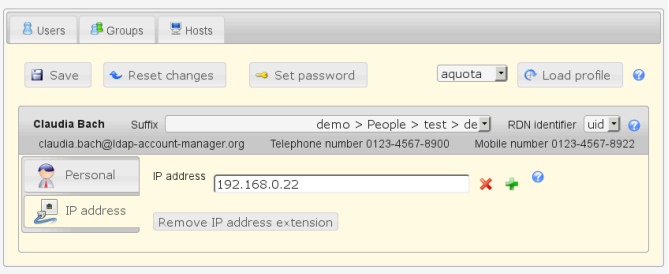
IP addresses (LAM Pro)

You can manage the IP addresses of user accounts (e.g. assigned by DHCP) with the ipHost module.

Configuration



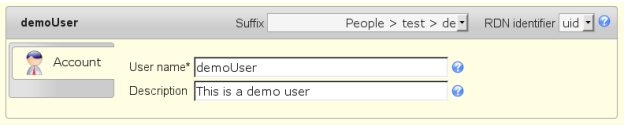
User editing



Account

This is a very simple module to manage accounts based on the object class "account". Usually, this is used for host accounts only. Please pay attention that users based on the "account" object class cannot have contact information (e.g. telephone number) as with "inetOrgPerson".

You can enter a user/host name and a description for your accounts.



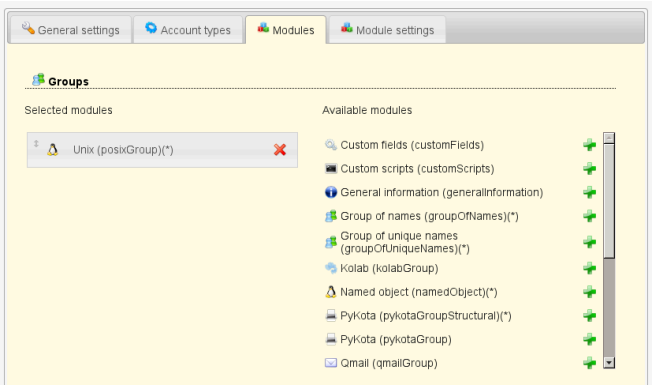
Groups

Unix

This module is used to manage Unix group entries. This is the default module to manage Unix groups and uses the nis.schema. Suse users who use the rfc2307bis.schema need to use LAM Pro.

Configuration

Please add the account type "Groups" and then select account module "Unix (posixGroup)".



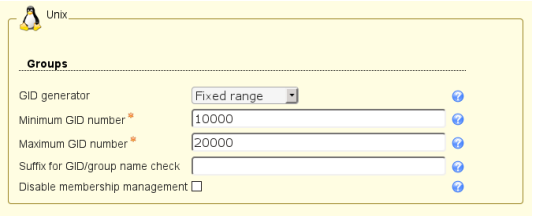
GID generator: LAM will suggest GID numbers for your accounts. Please note that it may happen that there are duplicate IDs assigned if users create groups at the same time. Use an overlay [http://www.openldap.org/doc/admin24/overlays.html] like "Attribute Uniqueness" (example) if you have lots of LAM admins creating groups.

- Fixed range: LAM searches for free numbers within the given limits. LAM always tries to use a free GID that is greater than the existing GIDs to prevent collisions with deleted groups.

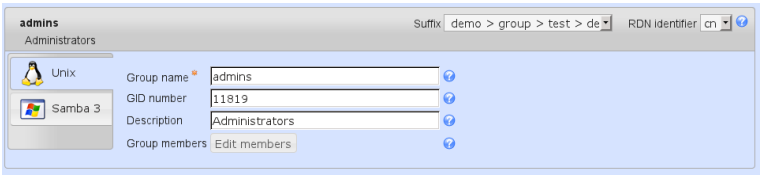
- Samba ID pool: This uses a special LDAP entry that includes attributes that store a counter for the last used UID/GID. Please note that this requires that you install the Samba schema and create an LDAP entry of object class "sambaUnixIdPool".

- Magic number: Use this if your LDAP server assigns the GID numbers automatically (e.g. DNA by 389 server). Enter the server's magic number setting.

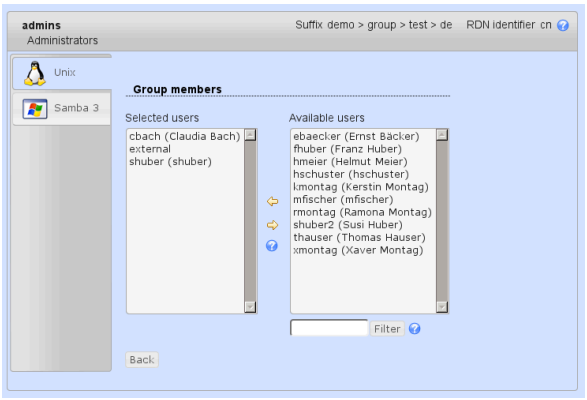
Disable membership management: Disables group membership management. This is useful if memberships are e.g. managed via group of names.



Group management:



Group membership management:



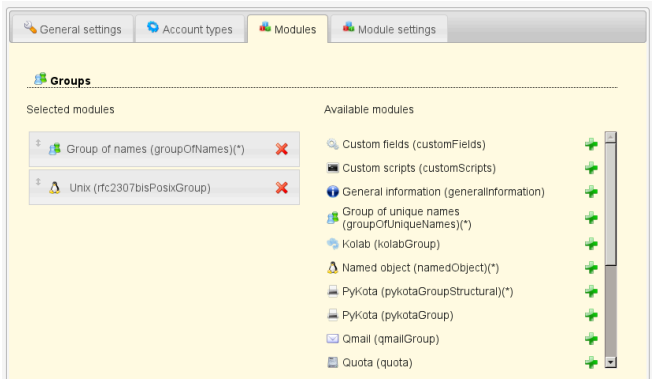
Unix groups with rfc2307bis schema (LAM Pro)

Some applications (e.g. Suse Linux) use the rfc2307bis schema for Unix accounts instead of the nis schema. In this case group accounts are based on the object class groupOf(Unique)Names or namedObject. The object class posixGroup is auxiliary in this case.

LAM Pro supports these groups with a special account module: **rfc2307bisPosixGroup**

Use this module only if your system depends on the rfc2307bis schema. The module can be selected in the LAM configuration. Instead of using groupOfNames as basis for your groups you may also use namedObject.

Module activation:



GID generator: LAM will suggest GID numbers for your accounts. Please note that it may happen that there are duplicate IDs assigned if users create groups at the same time. Use an overlay [http://www.openldap.org/doc/admin24/overlays.html] like "Attribute Uniqueness" (example) if you have lots of LAM admins creating groups.

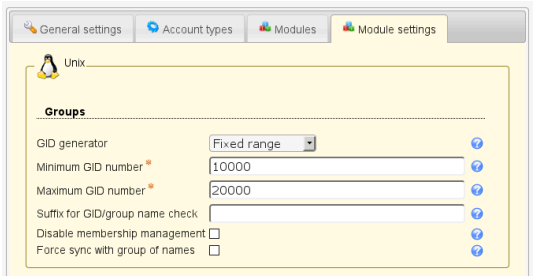
- Fixed range: LAM searches for free numbers within the given limits. LAM always tries to use a free GID that is greater than the existing GIDs to prevent collisions with deleted groups.

- Samba ID pool: This uses a special LDAP entry that includes attributes that store a counter for the last used UID/GID. Please note that this requires that you install the Samba schema and create an LDAP entry of object class "sambaUnixIdPool".

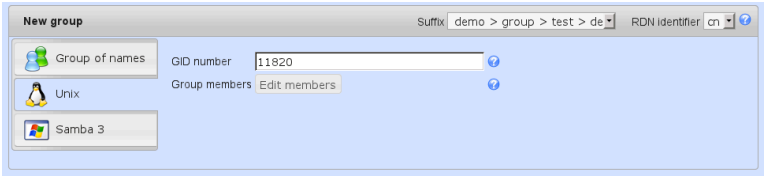
- Magic number: Use this if your LDAP server assigns the GID numbers automatically (e.g. DNA by 389 server). Enter the server's magic number setting.

Disable membership management: Disables group membership management. This is useful if memberships are e.g. managed via group of names.

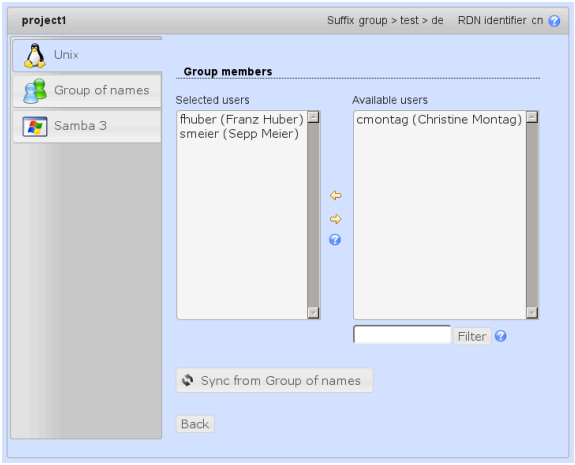
Force sync with group of names: This will automatically set the group memberships of the Unix part to the same members as set on group of names tab.



The GID number will be filled automatically based on the server profile configuration.



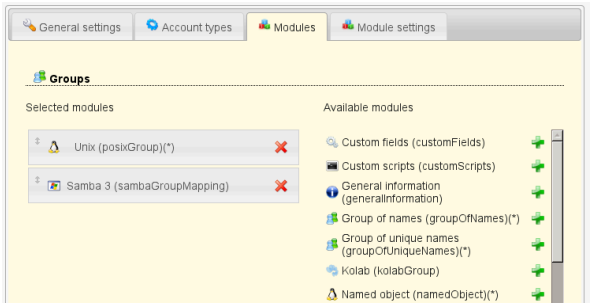
Group members can be edited and also synced with Group of (unique) names.



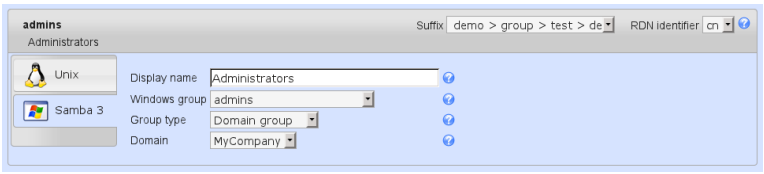
Samba 3

LAM supports managing Samba 3 groups. You can set special group types and also create Windows predefined groups like "Domain admins".

Module activation:

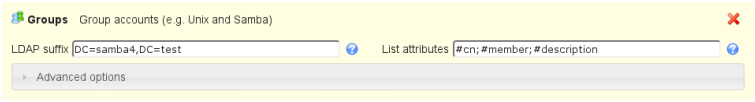


Group editing:

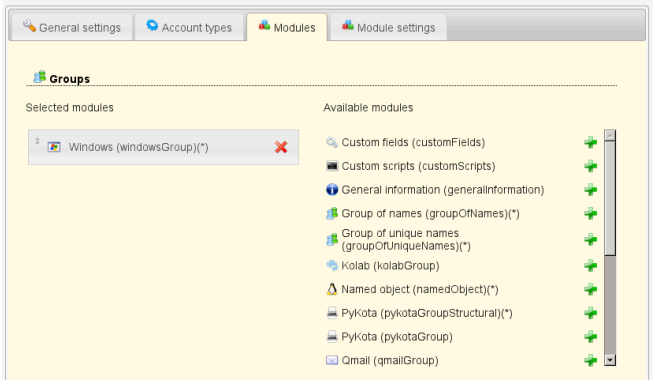


Windows (Samba 4)

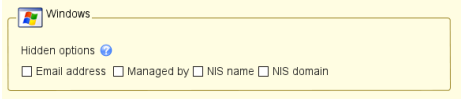
LAM can manage your Windows groups. Please enable the account type "Groups" in your LAM server profile and then add the group module "Windows (windowsGroup)(*)".



The default list attributes are for Unix and not suitable for Windows (blank lines in account table). Please use "#cn;#member;#description" or select your own attributes to display in the account list.



NIS support is deactivated by default. Enable it if needed on tab "Module settings".



Now you can edit your groups inside LAM. You can manage the group name, description and its type. Of course, you can also set the group members.

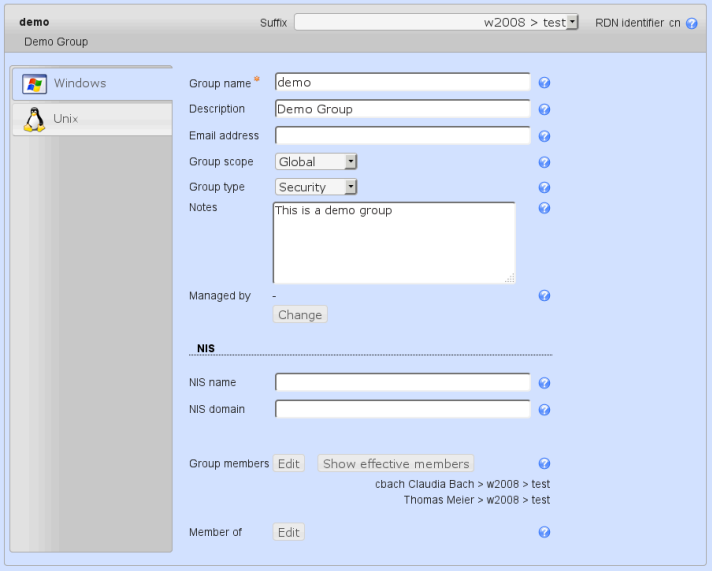
Group scopes:

- Global: Use this for groups with frequent changes. Global groups are not replicated to other domains.
- Universal: Groups with universal scope are used to consolidate groups that span domains. They are globally replicated.
- Domain local: Groups with domain local scope can be used to set permissions inside one domain. They are not replicated to other domains.

Group type:

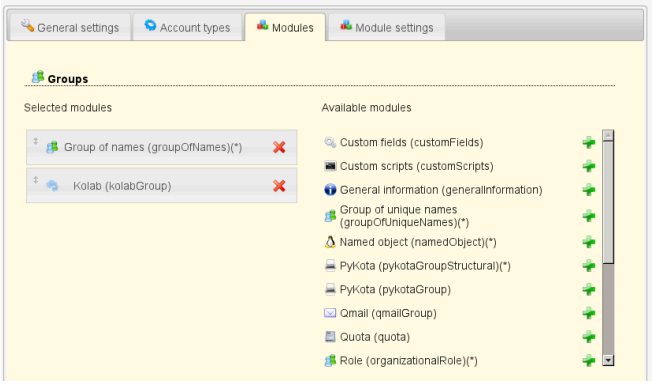
- Security: Use this group type to control permissions.
- Distribution: These groups are only used for email applications. They cannot be used to control permissions.

With "Show effective members" you can show a list of all members of this group including members of subgroups and their subgroups.

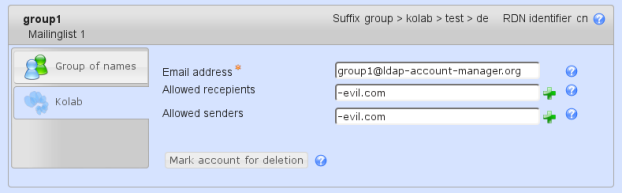


Kolab

Please activate the Kolab group module in your LAM server profile to activate Kolab support.



You can specify the email address and also set allowed sender and recipient addresses.

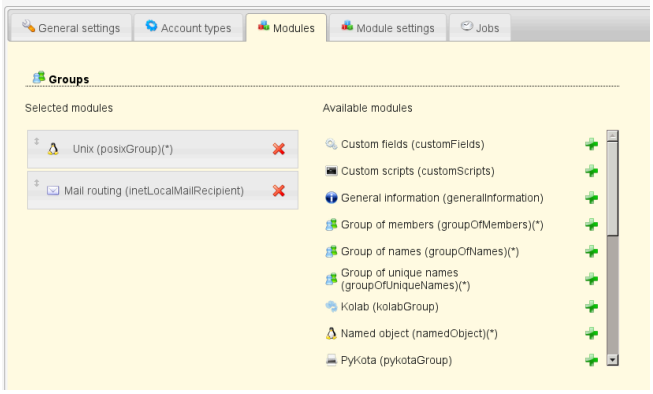


Mail routing

LAM supports to manage mail routing for group accounts.

Module activation:

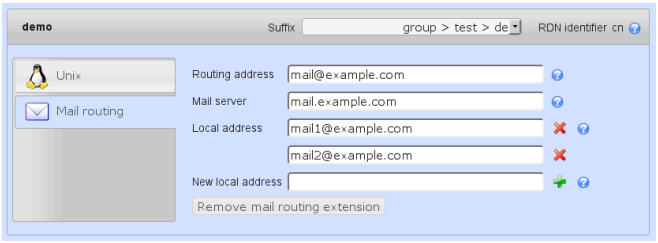
This feature can be activated by adding the "Mail routing" module to the group account type in your server profile.



Usage:

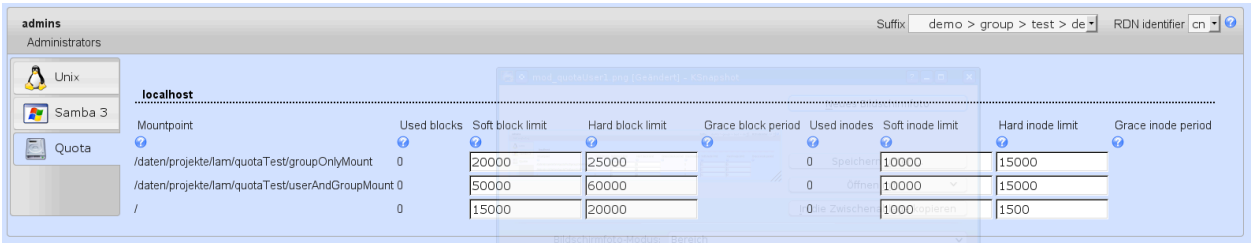
You can specify a routing address, the mail server and a number of local addresses to route.

In case you want to add this extension by default for new groups there is an option in profile editor.



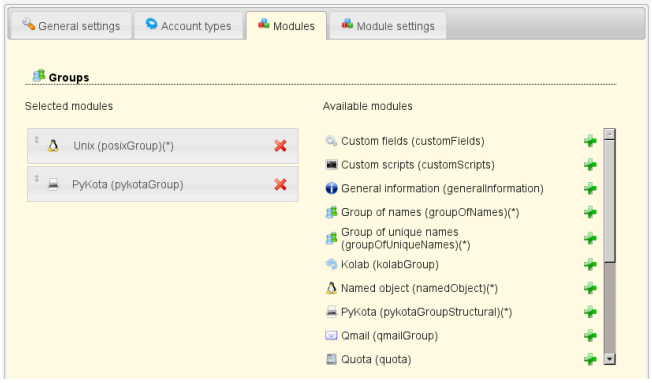
Quota

You can manage file system quotas with LAM. This requires to setup lamdaemon. File system quotas are not stored inside LAM but managed directly on the specified servers.



PyKota

There are two LAM group modules depending if your group entries should be built on object class "pykotaObject" or a different structural object class (e.g. "posixGroup"). For "pykotaObject" please select "PyKota (pykotaGroupStructural(*))" and "PyKota (pykotaGroup)" in all other cases.



Now you can add the PyKota extension to your groups.

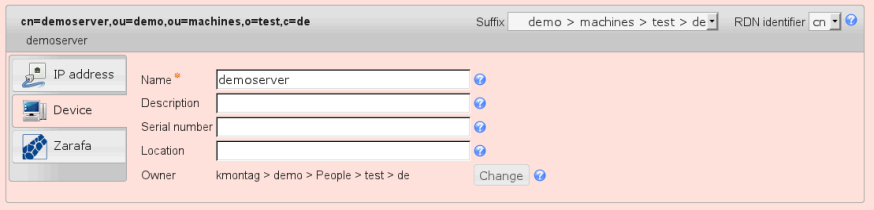
Hosts

Account

Please see the description here.

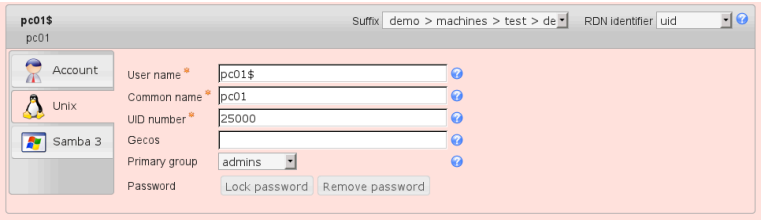
Device (LAM Pro)

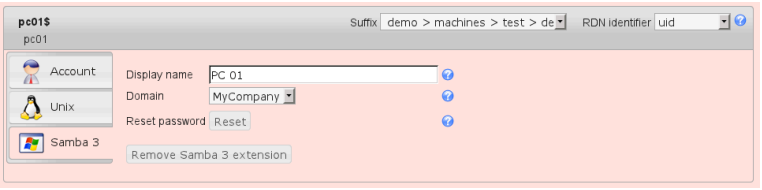
The device object class allows to manage general information about all sorts of devices (e.g. computers, network hardware, ...). You can enter the serial number, location and a describing text. It is also possible to specify the owner of the device.



Samba 3

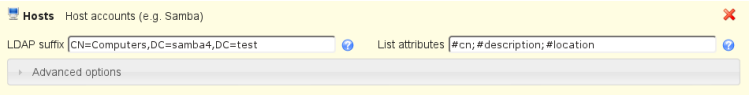
You can manage Samba 3 host entries by adding the Unix and Samba 3 account modules.



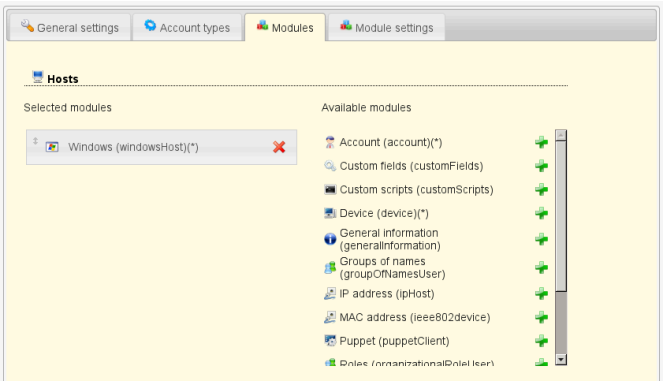


Windows (Samba 4)

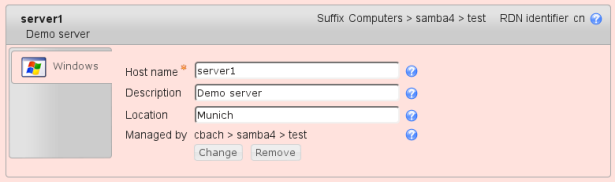
LAM can manage your Windows servers and workstations. Please enable the account type "Hosts" in your LAM server profile and then add the host module "Windows (windowsHost)(*)".



The default list attributes are for Unix and not suitable for Windows (blank lines in account table). Please use "#cn;#description;#location" or select your own attributes to display in the account list.



Now you will see you computer accounts inside LAM. You can set e.g. the server's description and location information.

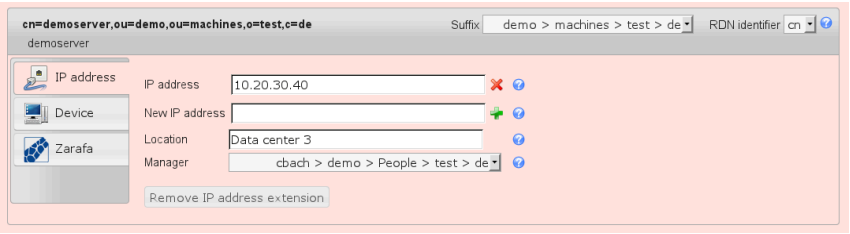


IP addresses (LAM Pro)

You can manage the IP addresses of host accounts with the ipHost module. It manages the following information:

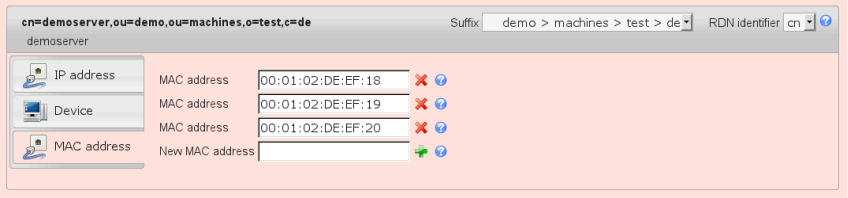
- IP addresses (IPv4/IPv6)
- location of the host
- manager: the person who is responsible for the host

You can activate this extension by adding the module ipHost to the list of active host modules.



MAC addresses

Hosts can have an unlimited number of MAC addresses. To enable this feature just add the "MAC address" module to the host account type.

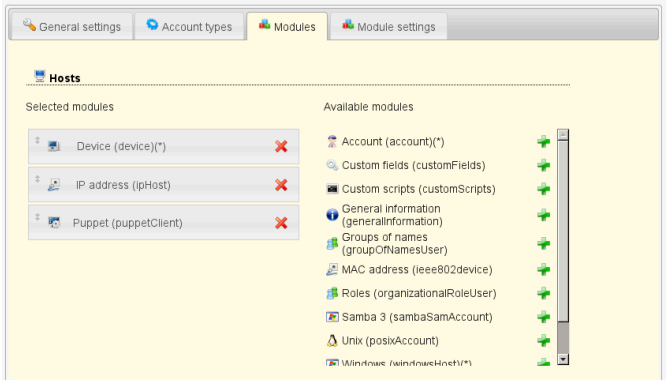


Puppet

LAM supports to manage your Puppet [http://puppetlabs.com/] configuration. You can edit all attributes like environment, classes, variables and parent node.

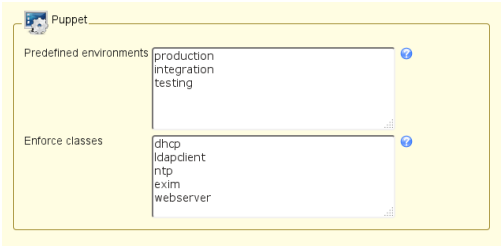
Configuration

To activate this feature please edit your LAM server profile and add the host module "Puppet (puppetClient)" on tab "Modules". This will add the Puppet tab to your host pages.



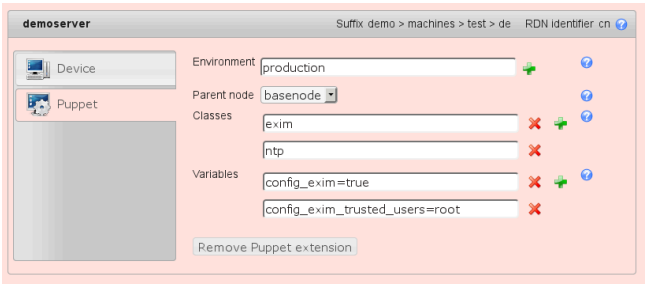
On tab "Module settings" in your LAM server profile you may also setup some common environment names. LAM will use them to provide autocompletion hints when editing the environment for a node.

If you enter any value in "Enforce classes" then LAM will only accept this list of classes.



Editing nodes

When you edit a host entry then you will see the tab "Puppet". Here you can add/remove the Puppet extension and edit all attributes.

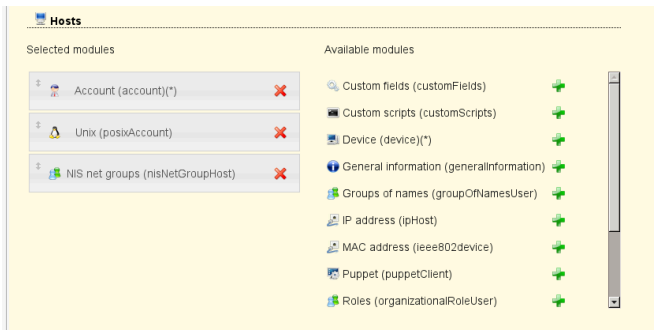


NIS net groups

NIS netgroups can be used to e.g. restrict SSH access to your machines.

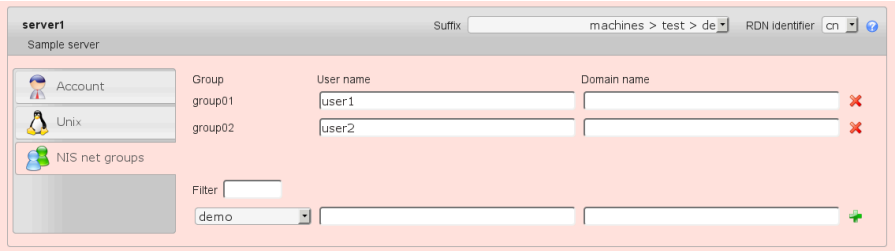
Configuration

Please add the module "NIS net groups (nisNetGroupHost)" to the list of active host modules.



Host editing

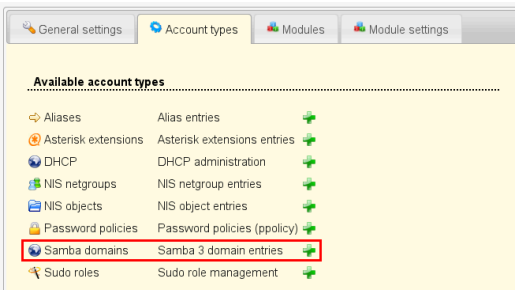
You will now see a new tab when editing hosts. Here you can assign memberships in NIS net groups and also set user/domain.



Samba 3 domains

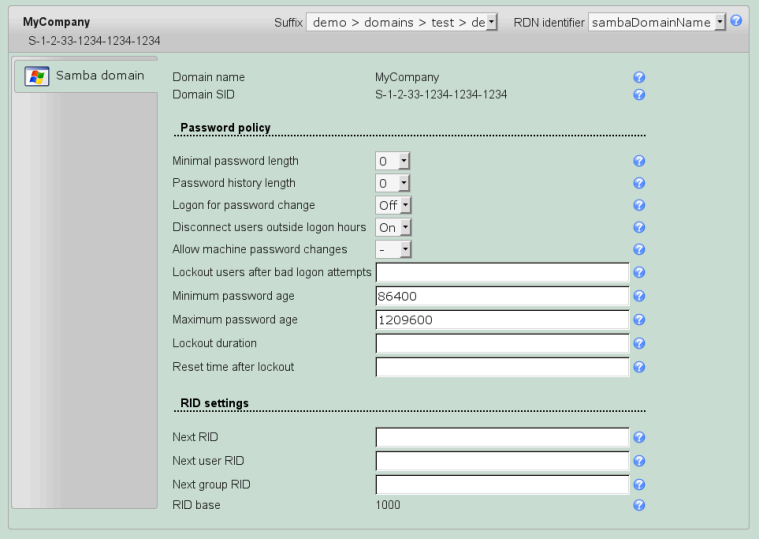
Samba 3 stores information about its domain settings inside LDAP. This includes the domain name, its SID and some policies. You can manage all these attributes with LAM.

Please activate the account type "Samba domains" in your LAM server profile. Please notice that Samba by default uses the LDAP root for domain objects (e.g. dc=example,dc=com).



This will add a new tab to LAM where you can manage domain information.

The domain name, SID and RID base can only be specified for new domains and are not changeable via LAM at a later time. You may setup several password policies for your Samba domains and also some RID options that influence the creation of SIDs for users/groups/hosts.

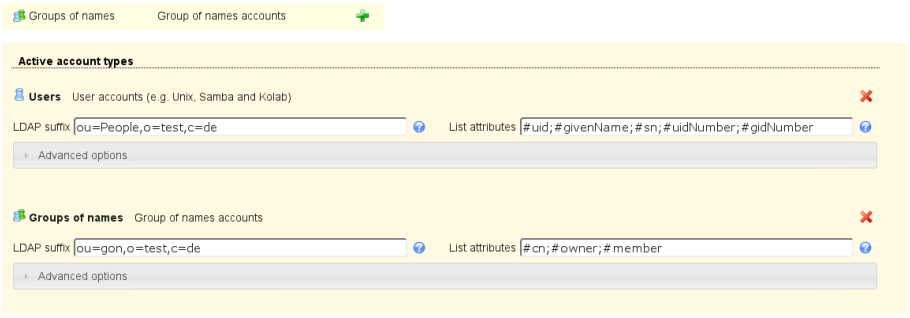


Group of (unique) names and group of members (LAM Pro)

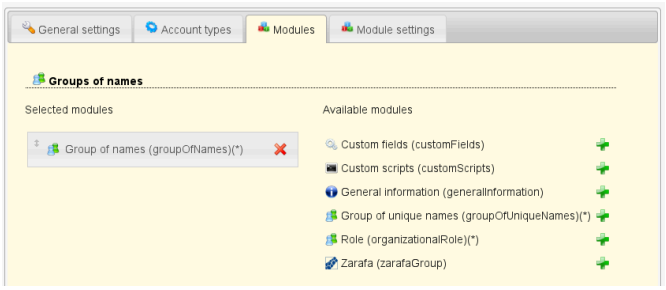
These classes can be used to represent group relations. Since they allow DNs as members you can also use them to represent nested groups.

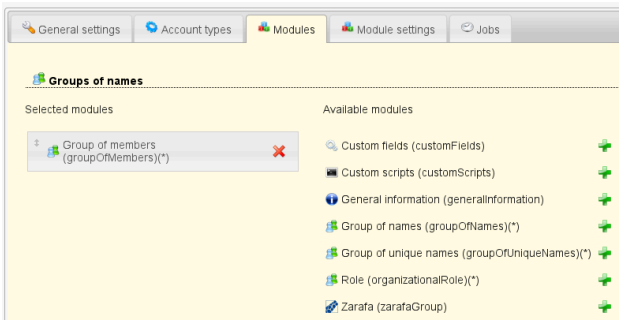
Configuration:

Activate the account type "Group of names" in your LAM server profile to use these account modules. Alternatively, you can use the account type "Groups".

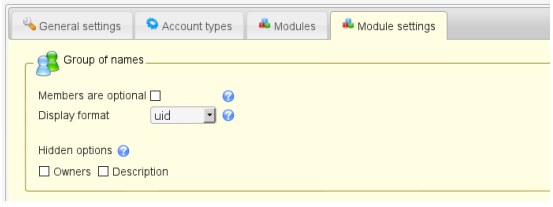


Then add the module "Group of names (groupOfNames)", "Group of unique names (groupOfUniqueNames)" or "Group of members (groupOfMembers)".





On the module settings tab you set some options like the display format for members/owners and if fields like description should not be displayed.



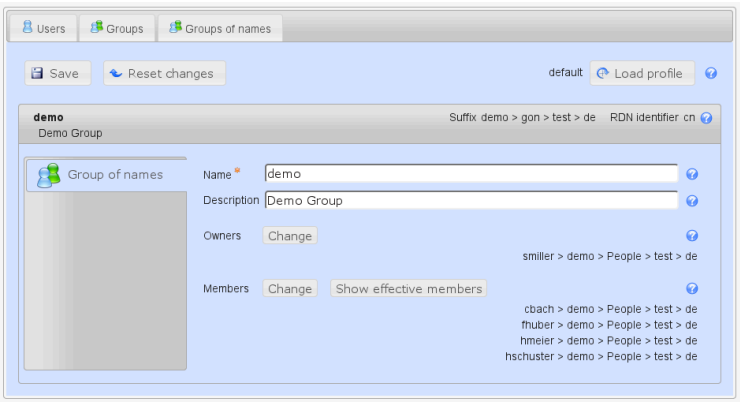
Group management:

Group of (unique) names have four basic attributes:

- Name: a unique name for the group
- Description: optional description
- Owner: the account which owns this group (optional)
- Members: the members of the group (at least one is required)

You can add any accounts as members. This includes other groups which leads to nested groups.

To show members of nested groups click on "Show effective members". Please note that for large groups this will run lots of queries against your LDAP server.



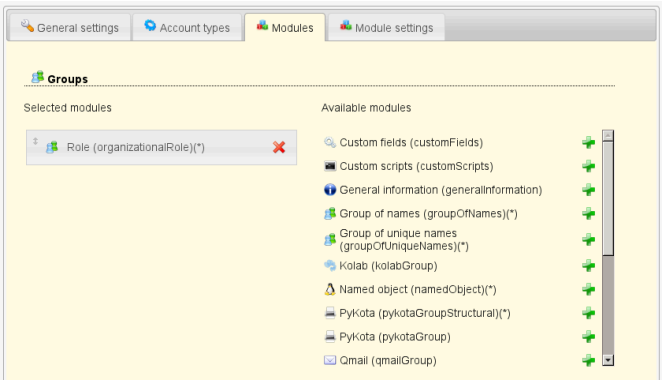
Organizational roles (LAM Pro)

This module manages roles via the organizationalRole object class. There is also a user module to manage memberships on the user edit page.

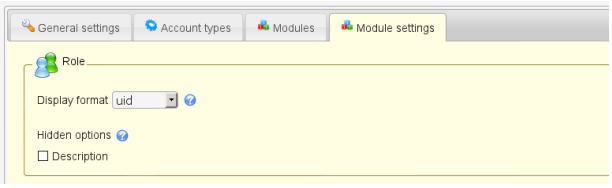
Configuration:

Activate the account type "Groups" in your LAM server profile to use this account module. Alternatively, you can use the account type "Group of names".

Then add the module "Role (organizationalRole)".



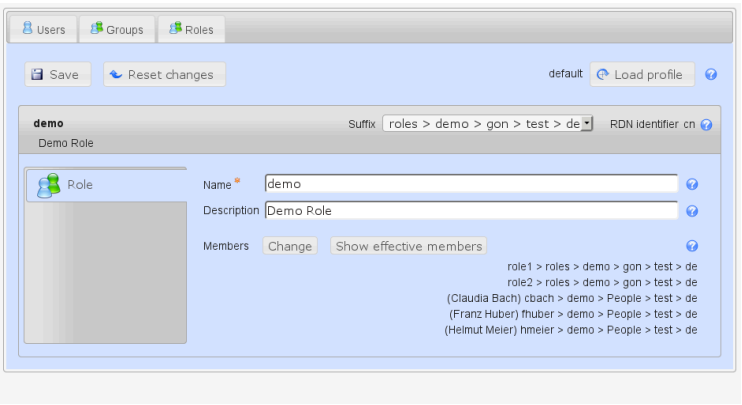
On the module settings tab you set some options like the display format for members and if description should not be displayed.



Role management:

You can add any accounts as members. This includes other roles which leads to nested roles (needs to be supported by LDAP client applications).

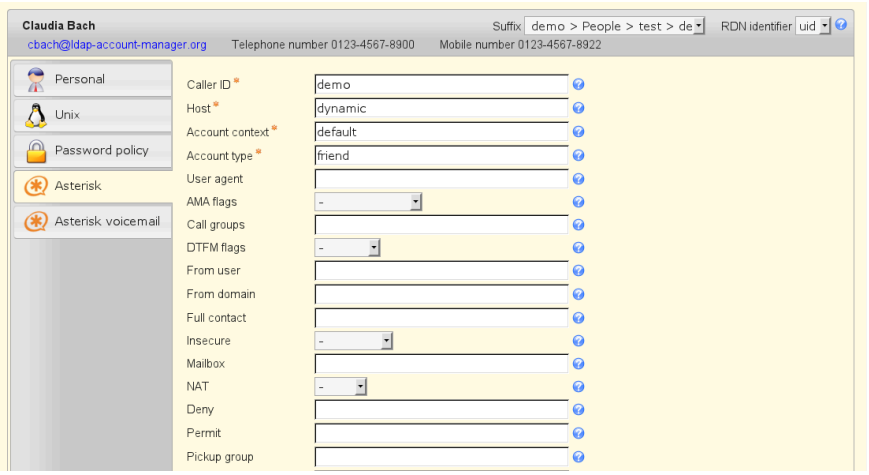
To show members of nested roles click on "Show effective members". Please note that for large roles this will run lots of queries against your LDAP server.



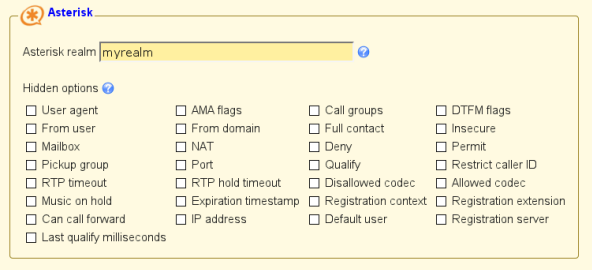
Asterisk

LAM includes large support for Asterisk. You can add Asterisk extensions (including voicemail) to your users and also manage Asterisk extensions.

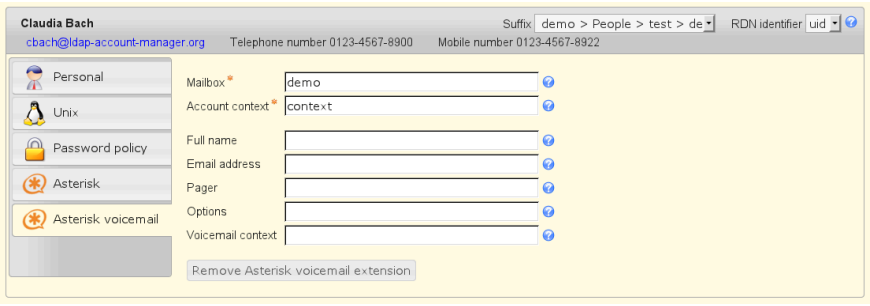
The Asterisk support for users can be added by selecting the Asterisk and Asterisk voicemail modules for users in your LAM server profile. This will add the following tabs to your user accounts.



The Asterisk module allows to edit a large amount of attributes. Therefore, you can hide unused fields. Please edit you server profile (Module settings) to do so.

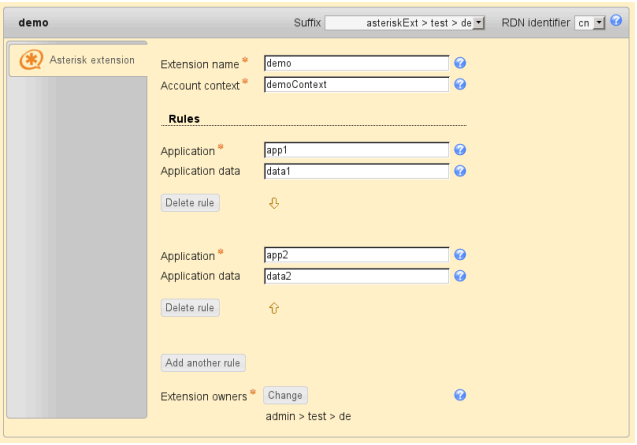


Of course, the voicemail part of Asterisk is also supported.



If you also want to manage Asterisk extensions then simply add the account type "Asterisk extensions" and its module to your server profile.

LAM groups your Asterisk extension entries by extension name and account context. If you edit an extension then you will see the Asterisk entries as rules. LAM manages that all rule entries have the same owners and assigns the priorities.



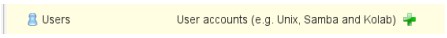
Kopano (LAM Pro)

Kopano is an OpenSource collaboration software. LAM Pro provides support to manage Kopano user entries, groups, address lists and servers. It covers all settings for these types including resource and quota settings.

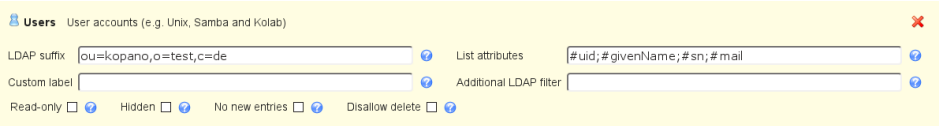
Users

Configuration

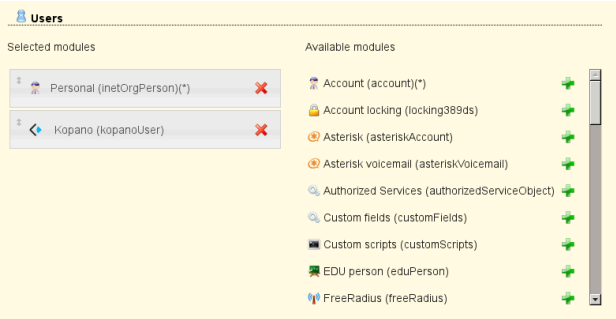
To enable Kopano support for users please activate the Kopano module for the user account type in you server profile:



Adjust the suffix and list attributes to your needs.



Then select the Kopano user module (tab Modules). You can combine it with Personal module, Unix or Windows.



Next configure the module to your needs (tab Module settings).

Attention: LAM Pro uses the Kopano OpenLDAP schema by default. This schema fits for OpenLDAP, OpenDJ, Apache Directory server and other common LDAP servers. If you run Samba 4 or Active Directory then you need to switch the schema to "Active Directory" on the module settings tab.

You can hide options that you do not need. E.g. if you do not want to manage quotas per user then you can hide these options.

Examples for your Zarafa ldap.cfg:

"Send as" attribute: dn

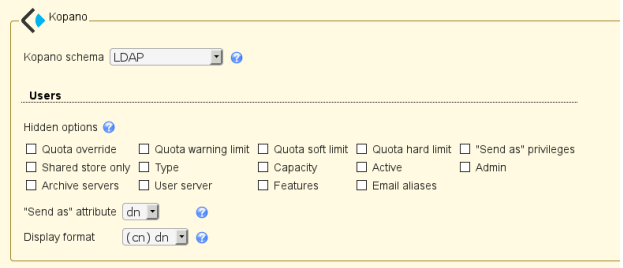
ldap_user_sendas_attribute_type = dn

"Send as" attribute: uid

ldap_user_sendas_attribute_type = text

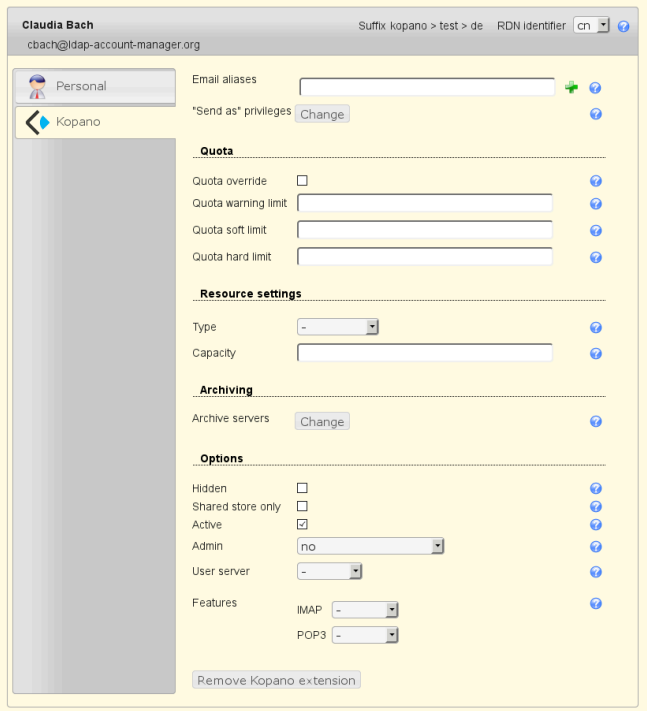
ldap_user_sendas_relation_attribute = uid

Attention: If the Active Directory schema is used then LAM will always use dn and ignore this setting.



Usage

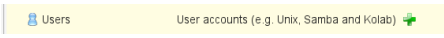
LAM Pro will now display the Kopano tab on your users. This includes email settings, quotas and some options (e.g. hide from address book). You can also set the resource type and capacity for meeting rooms and equipment. The Kopano extension can be added and removed at any time for every user.

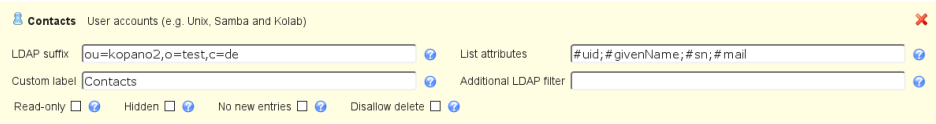


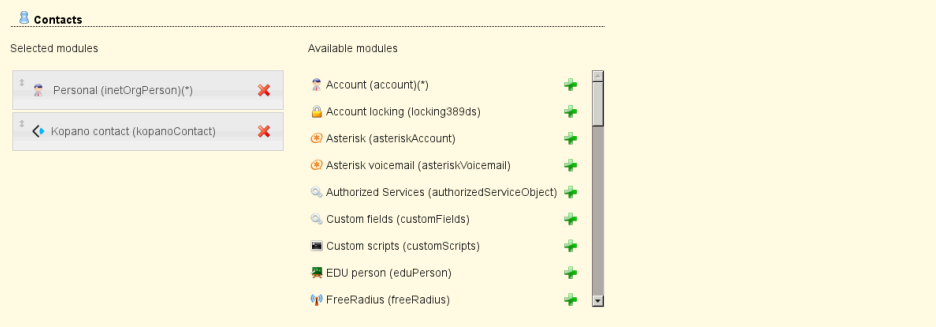
Contacts

Configuration

The configuration is similar to users. Instead of the Kopano user module please select the contact module.

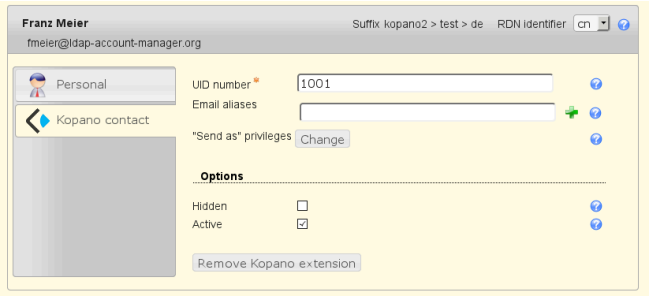






Usage

LAM Pro will now display the Kopano contact tab on your users. The Kopano extension can be added and removed at any time for every user.



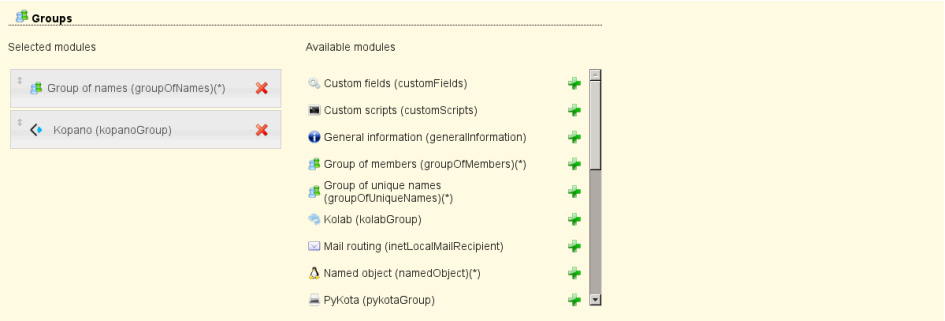
Groups

Configuration

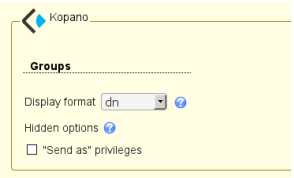
To enable Kopano support for groups please activate the Kopano module for the group account type in you server profile:

Adjust the suffix and list attributes to your needs.

Then select the Kopano group module (tab Modules). You can combine it with groups of names module, Unix or Windows.

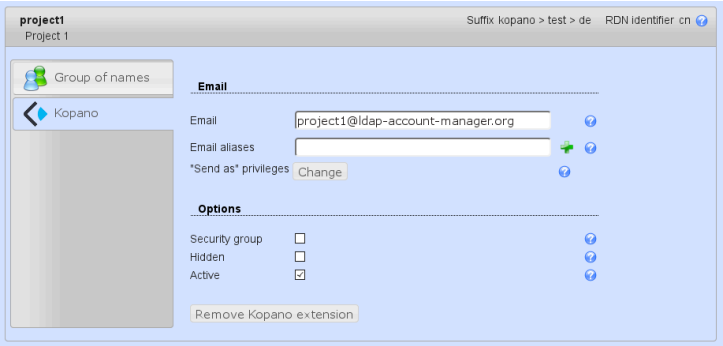


Next configure the module to your needs (tab Module settings).



Usage

LAM Pro will now display the Kopano tab on your groups. The Kopano extension can be added and removed at any time for every group.



Address lists

Configuration

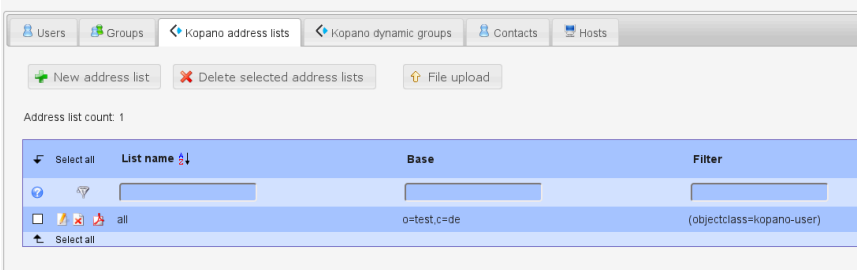
To enable Kopano support for address lists please activate the Kopano address list account type in you server profile (tab account types):

Adjust the suffix and list attributes to your needs.

Then select the Kopano address list module (tab Modules).

Usage

LAM Pro will now display the Kopano address list tab.

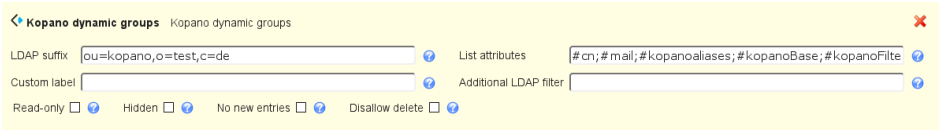


Dynamic groups

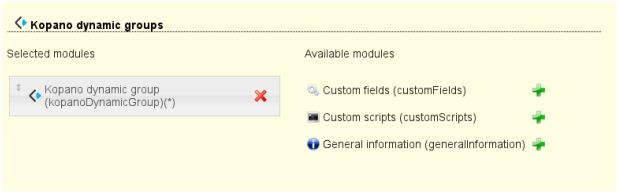
Configuration

To enable Kopano support for dynamic groups please activate the Kopano dynamic group account type in you server profile (tab account types):

Adjust the suffix and list attributes to your needs.

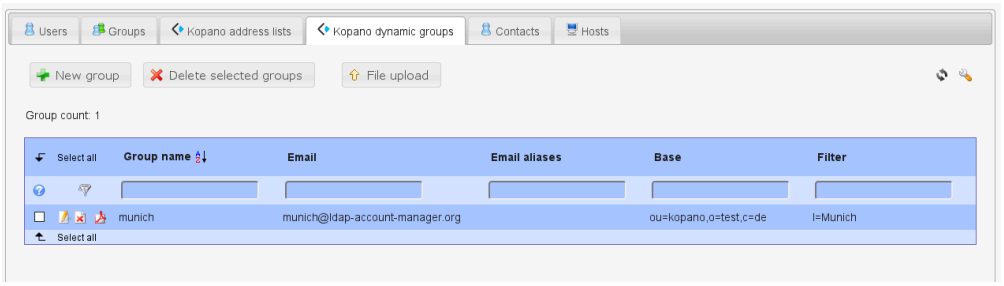


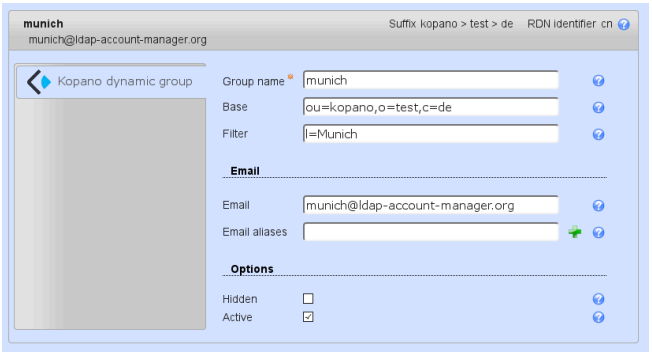
Then select the Kopano dynamic group module (tab Modules).



Usage

LAM Pro will now display the Kopano address list tab.

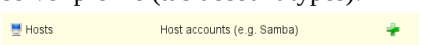




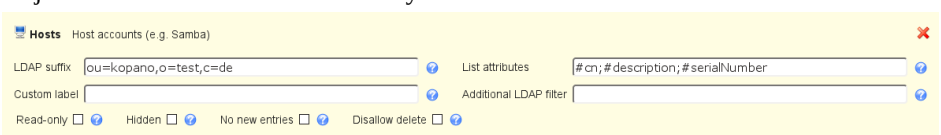
Servers

Configuration

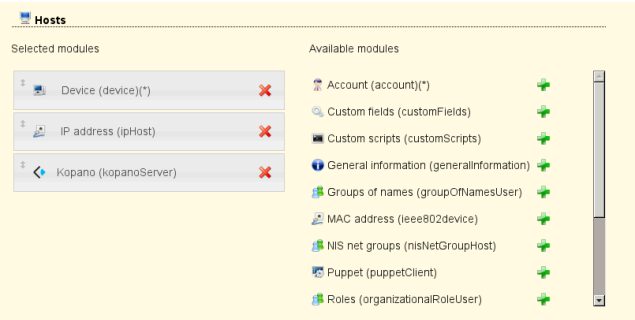
To enable Kopano support for servers please activate the Kopano server module for the hosts account type in you server profile (tab account types):



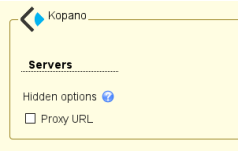
Adjust the suffix and list attributes to your needs.



Then select the Kopano server module (tab Modules).

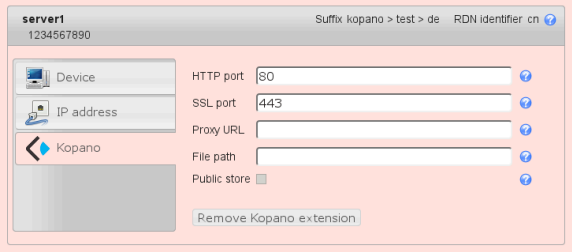


Next configure the module to your needs (tab Module settings).



Usage

LAM Pro will now display the Kopano tab on your hosts. The Kopano extension can be added and removed at any time for every server.



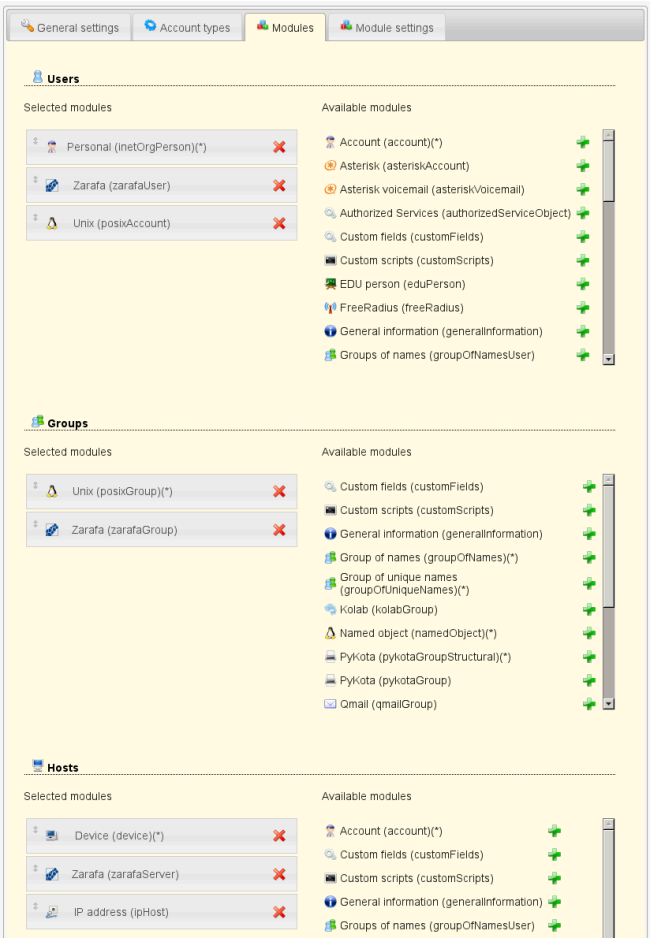
Zarafa (LAM Pro)

Zarafa is an OpenSource collaboration software. LAM Pro provides support to manage Zarafa server entries, users and groups. It covers all settings for these types including resource and quota settings.

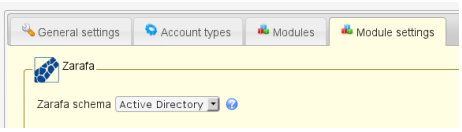
LAM Pro is an official Zarafa Certified Integration.

Configuration

To enable Zarafa support in LAM Pro please activate the Zarafa modules for the Users, Groups and Hosts account types in you server profile:



Attention: LAM Pro uses the Zarafa OpenLDAP schema as default. This schema fits for OpenLDAP, OpenDJ, Apache Directory server and other common LDAP servers. If you run Samba 4 or Active Directory then you need to switch the schema to "Active Directory" on the module settings tab:



You can configure which parts of the Zarafa user options should be enabled. E.g. if you do not want to manage quotas per user then you can hide these options on the tab "Module settings".

"Send as" attribute: Here you can specify how "Send as" privileges should be managed. LAM supports "uid" and "dn".

If you select "uid" the LAM will store user names in the zarafaSendAsPrivilege attribute. This way you are restricted to specify user accounts as "Send as" allowed.

You can also set this option to "dn" and LAM will store DNs in the zarafaSendAsPrivilege attribute. In this case you may specify users and groups as "Send as" allowed.

Examples for your Zarafa ldap.cfg:

"Send as" attribute: **dn**

ldap_user_sendas_attribute_type = dn

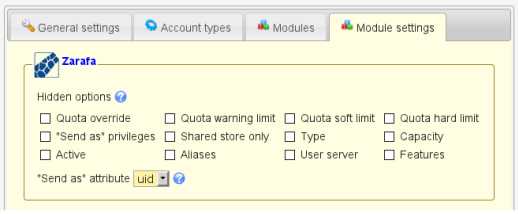
"Send as" attribute: **uid**

ldap_user_sendas_attribute_type = text

ldap_user_sendas_relation_attribute = uid

Attention: If the Active Directory schema is used then LAM will always use dn and ignore this setting.

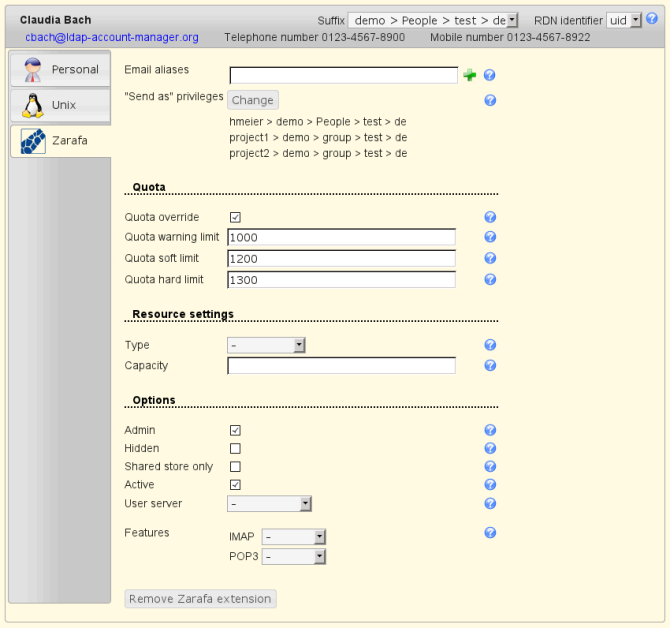
Features: Zarafa 7 allows to enable IMAP/POP3 for each user. Please hide the option "Features" if you use Zarafa 6.x.



Users

This is an example of the user edit page with all possible settings. This includes email settings, quotas and some options (e.g. hide from address book). You can also set the resource type and capacity for meeting rooms and equipment. The Zarafa extension can be added and removed at any time for every user.

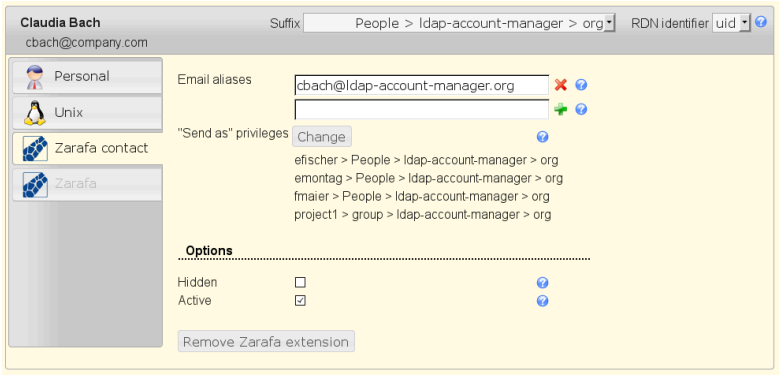
Please note that the option "Features" requires Zarafa 7. Please hide this option in the LAM server profile if you run Zarafa 6.x.



Contacts

LAM Pro can manage your Zarafa contact entries. You can set the email aliases and "send as" privileges. Additionally, accounts may be hidden in the address book or disabled.

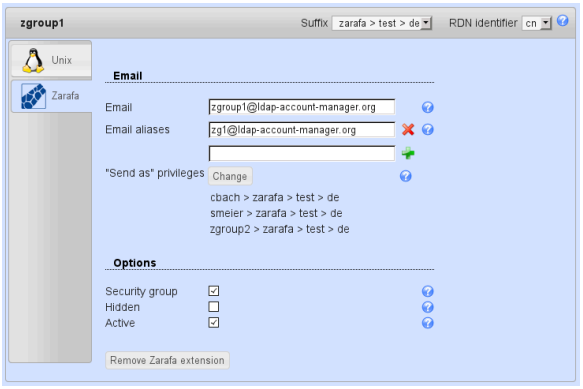
Please note that you can either use the Zarafa user module or Zarafa contact. LAM Pro will disable the other tab when enabling one of them.



Groups

This is the edit page for groups. You can enter an email address and additional aliases for your groups. It is also possible to specify options (e.g. hide from address book). The extension can be added/removed dynamically.

Please note that the option "Send-as privileges" requires the Zarafa 7.0.3 schema. Please hide this option in the LAM server profile if you run Zarafa < 7.0.3.

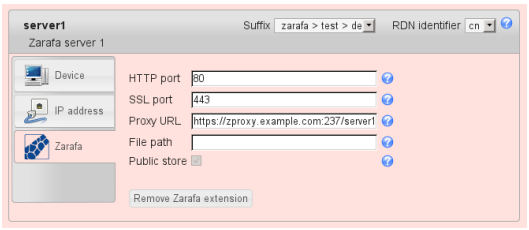


Servers

The Zarafa extension for host accounts allows to set the connection ports and file path. You can add/remove the extension at any time.

Setting the public store option is only possible for new host entries.

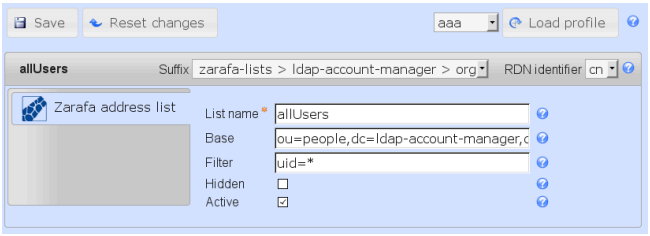
Please note that the proxy URL option requires the Zarafa 7.1 schema. Please hide this option in your LAM server profile if you use an older version.



Address lists

Zarafa allows to store address lists in LDAP. You need to define a search base and LDAP filter for each address list. E.g. entering "ou=people,dc=company,dc=com" as base and "uid=*" will select all users that are stored in "ou=people,dc=company,dc=com".

You can also hide your lists from the address book or temporarily disable them.

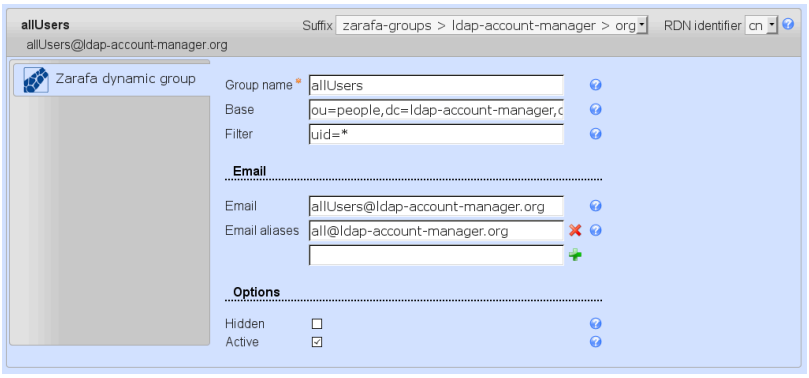


Dynamic groups

Zarafa allows to define dynamic groups in LDAP. You need to define a search base and LDAP filter for each group. E.g. entering "ou=people,dc=company,dc=com" as base and "uid=*" will select all users that are stored in "ou=people,dc=company,dc=com".

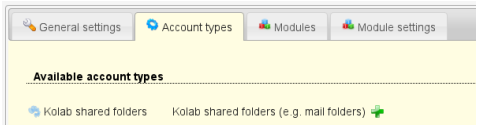
Dynamic groups may have an email address and multiple email alias addresses.

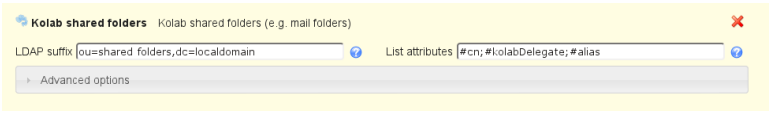
You can also hide your dynamic groups from the address book or temporarily disable them.



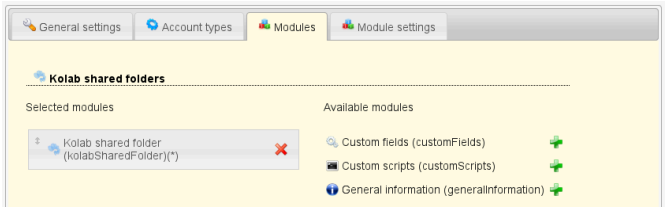
Kolab shared folders

Please add the account type "Kolab shared folders" in your LAM server profile and set the correct LDAP suffix.

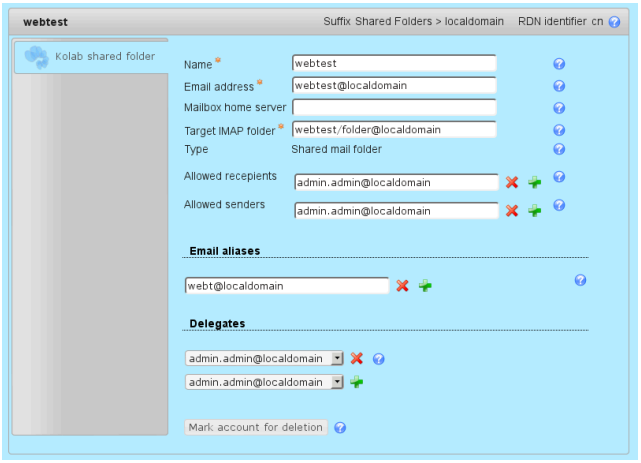




Then add the "Kolab shared folder" module on tab "Modules".



Now you can start to add shared folders inside LAM.



DHCP

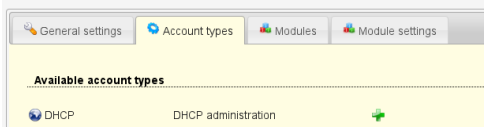
You can mange your DHCP server with LAM. It supports to manage subnets, fixed IP entries, IP ranges and DDNS.

Configuration

The DHCP management can be activated by adding the account type DHCP to your server profile. Please also add the DHCP modules.

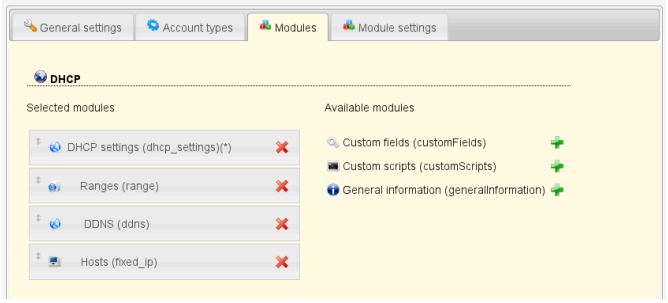
LAM requires that you use an LDAP entry with the object class "dhcpService" or "dhcpServer" as suffix for this account type. If the "dhcpServer" entry points to a "dhcpService" entry via "dhcpServiceDN" then you need to use the DN of the "dhcpService" entry as LDAP suffix for DHCP.

Add account type:



Set suffix:

Add modules:



Example server entry:

```
dn: cn=server,ou=dhcp,dc=ldap-account-manager,dc=org
```

```
objectclass: dhcpServer
objectclass: dhcpOptions
objectclass: top
cn: server
dhcpcomments: My DHCP server
dhcpoption: domain-name "ldap-account-manager.org"
dhcpoption: domain-name-servers 192.168.1.1
dhcpoption: routers 192.168.1.1
dhcpoption: netbios-name-servers 192.168.1.1
dhcpoption: subnet-mask 255.255.255.0
dhcpoption: netbios-node-type 8
dhcpstatements: default-lease-time 3600
dhcpstatements: max-lease-time 7200
dhcpstatements: include "mykey"
dhcpstatements: ddns-update-style interim
dhcpstatements: update-static-leases true
dhcpstatements: ignore client-updates
```

Example settings for dhcpd.conf:

```
ddns-update-style none;
deny unknown-clients;
ldap-server "server";
ldap-dhcp-server-cn "server";
ldap-port 389;
ldap-username "uid=dhcp,ou=people,dc=ldap-account-manager,dc=org";
ldap-password "{SSHA}XXXXXXXXXXXX";
ldap-base-dn "ou=dhcp,dc=ldap-account-manager,dc=org";
ldap-method dynamic;
ldap-debug-file "/var/log/dhcp-ldap-startup.log";
```

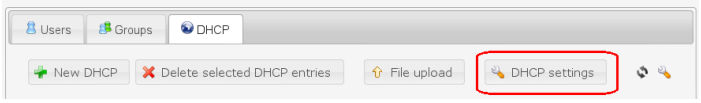
slapd.conf changes:

```
include /etc/ldap/schema/dhcp.schema
index dhcpHWAddress eq
```

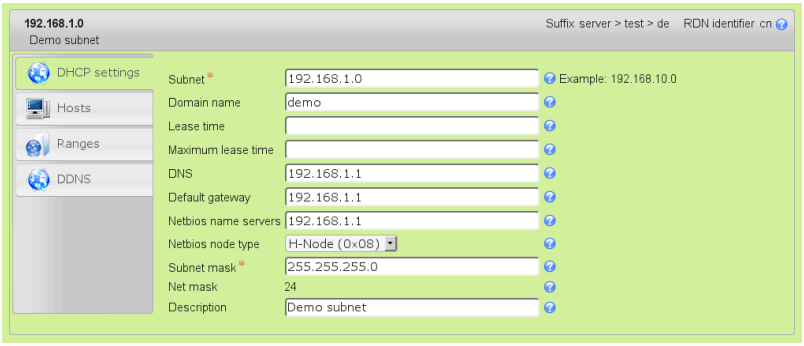
```
index dhcpClassData eq
```

Run slapindex to rebuild the index.

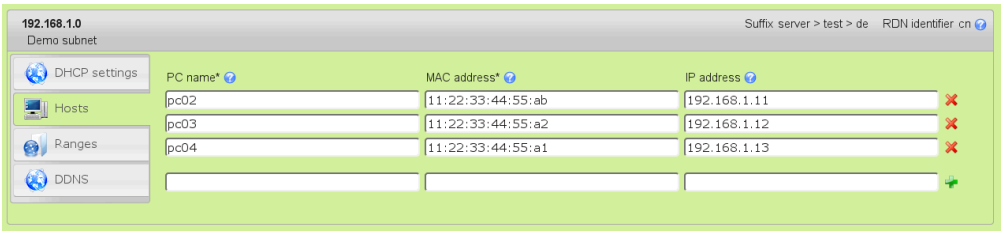
You can manage the settings of your DHCP service/server entry:



You can easily create new subnet entries.

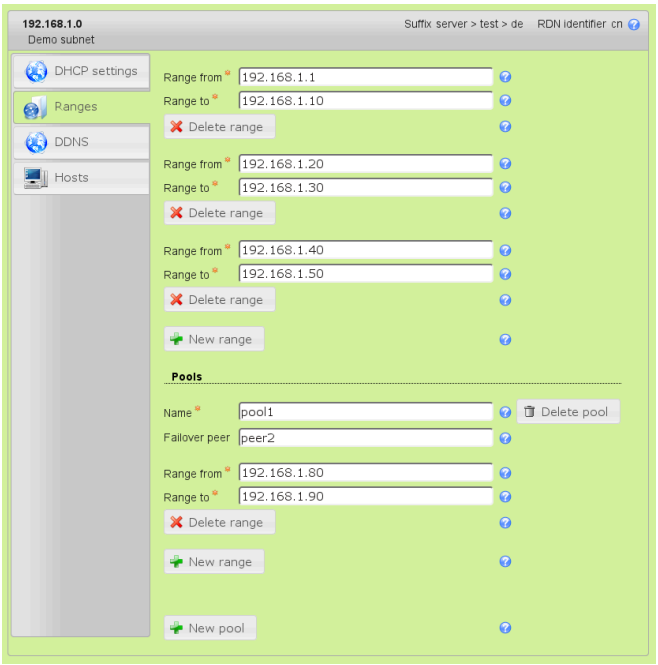


It is also possible to specify a list of fixed IPs.

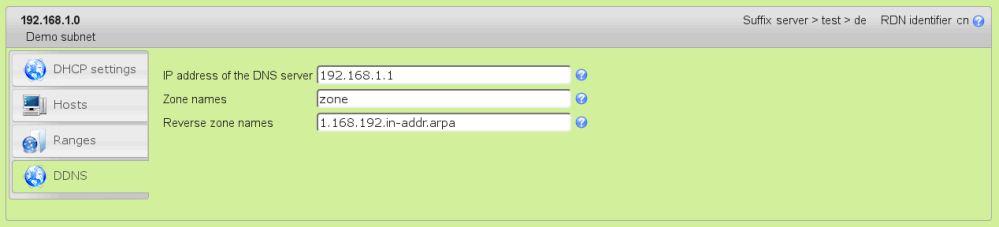


IP ranges may be specified.

If you use failover pools for your IP ranges please use the pool options on the bottom. Here you can add DHCP pools (object class "dhcpPool") and specify the failover peer.



If you activated DDNS in the server entry then you may also specify the DDNS settings for this subnet.

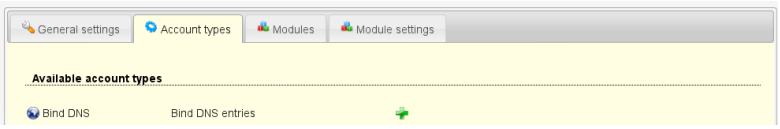


Bind DLZ (LAM Pro)

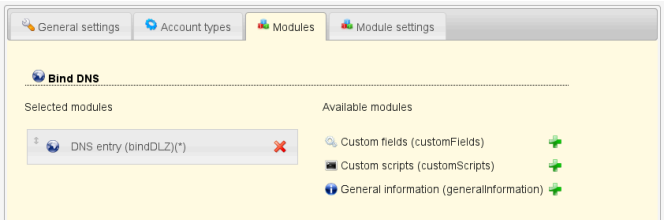
Bind DLZ [http://bind-dlz.sourceforge.net] is an extension to the DNS server Bind [http://www.isc.org/software/bind] that allows to store DNS entries inside LDAP. Please install the Bind DLZ schema file on your LDAP server. It is part of the DLZ patch.

Configuration

First, you need to add the Bind DNS account type and the Bind DLZ module:



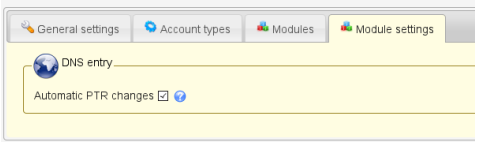
Please set the LDAP suffix either to an existing DNS zone (dlzZone) or an organizational unit that should include your DNS zones.



Automatic PTR management

LAM can automatically create/delete PTR entries for the entered IPv4/6 records. You can enable this feature on the module settings tab.

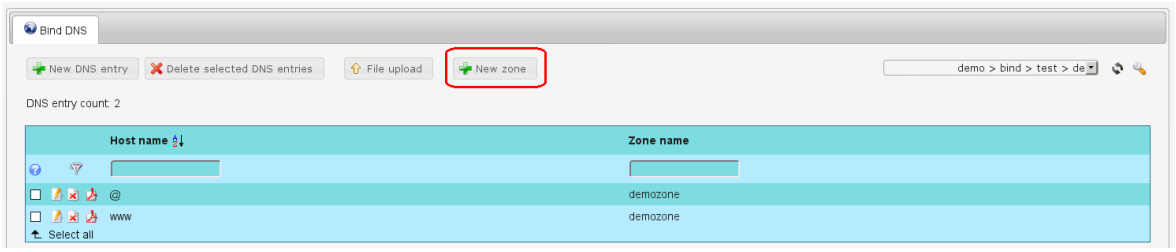
PTR records will get the same TTL as IP records. Please note that you need to have matching reverse zones (".in-addr.arpa"/".ip6.arpa") under the same suffix as your other DNS entries.



Zone management

If you do not yet have a DNS zone then LAM can create one for you. In list view switch the suffix to an organizational unit DN. Now you will see a button "New zone".

This will create the zone container entry and a default DNS entry "@" for authoritative information. Now switch the suffix to your new zone and start adding DNS entries.



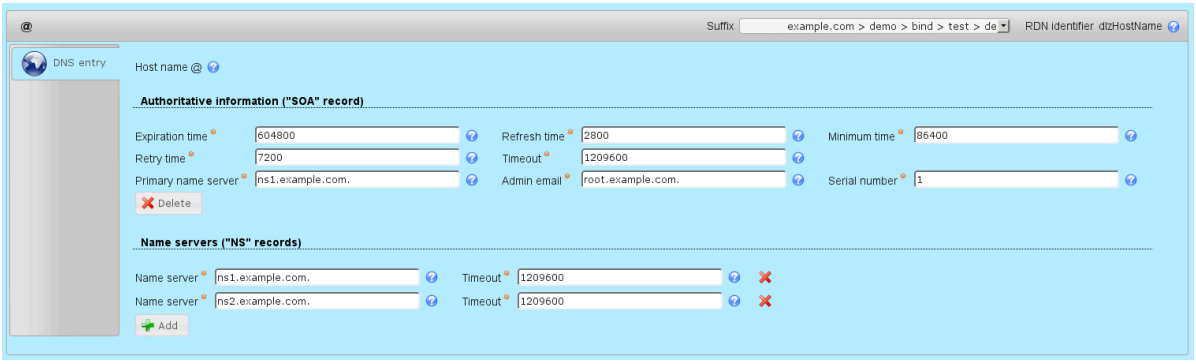
DNS entries

LAM supports the following DNS record types:

- SOA: authoritative information
- NS: name servers
- A/AAAA: IP addresses
- PTR: reverse DNS entries
- CNAME: alias names
- MX: mail servers
- TXT: text records
- SRV: service entries

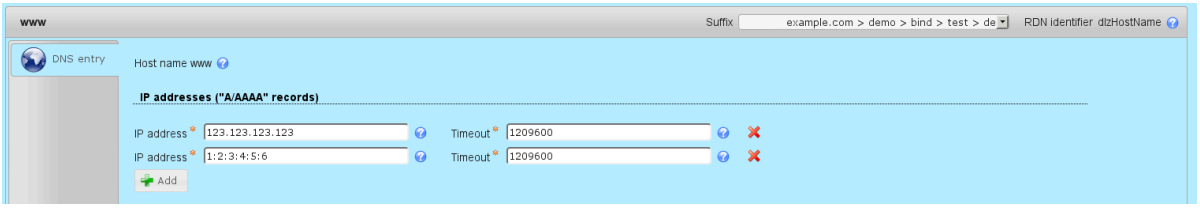
Authoritative (SOA) and name server (NS) records

Here you can manage general information about the zone like timeouts and name servers. Please note that name servers must be inserted in a special format (dot at the end).



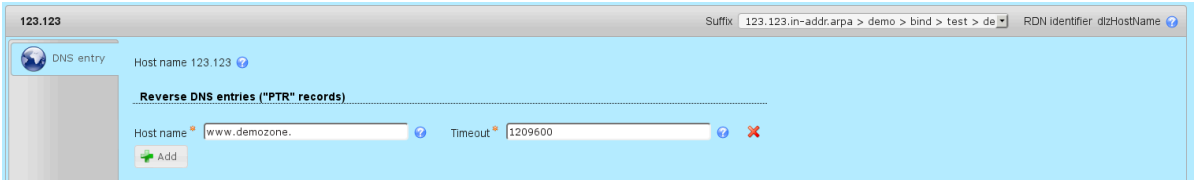
IP addresses (A/AAAA)

LAM will automatically set the correct type (A/AAAA) depending if you enter an IPv4 or IPv6 address.



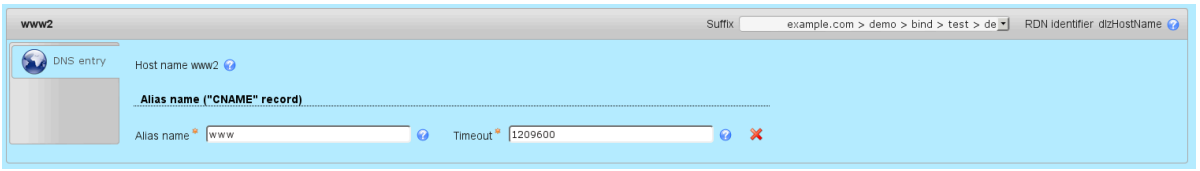
Reverse DNS entries

Reverse DNS entries are important when you need to find the DNS name that is associated with a given IP address. Reverse DNS entries are stored in a separate DNS zone.



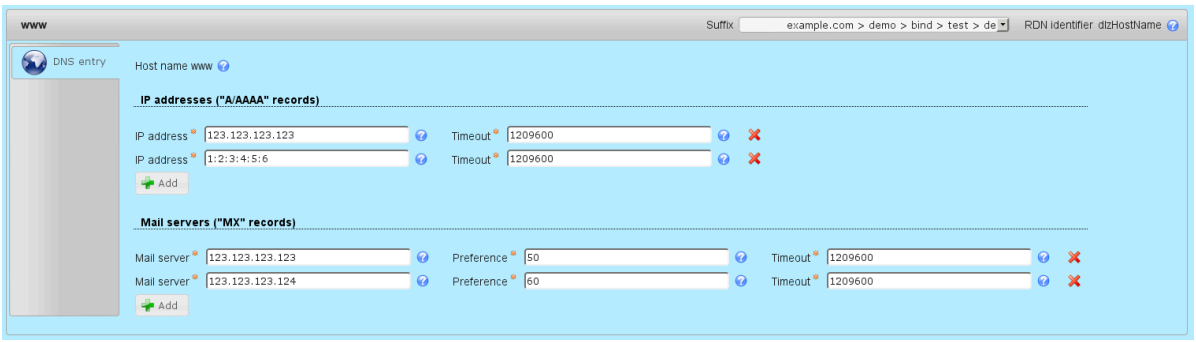
Alias names (CNAME)

Sometimes a DNS entry should simply point to a different DNS entry (e.g. for migrations). This can be done by adding an alias name.



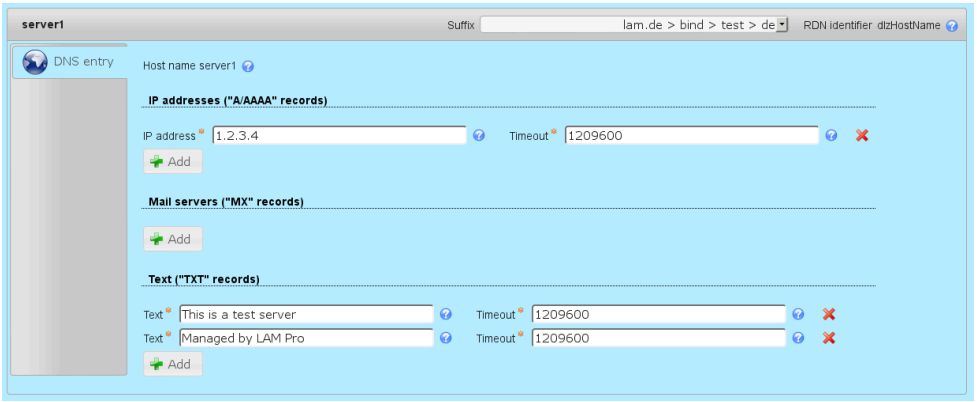
Mail servers (MX)

The mail server entries define where mails to a domain should be delivered. The server with the lowest preference has the highest priority.



Text records (TXT)

Text records can be added to store a description or other data (e.g. SPF information).



Services (SRV)

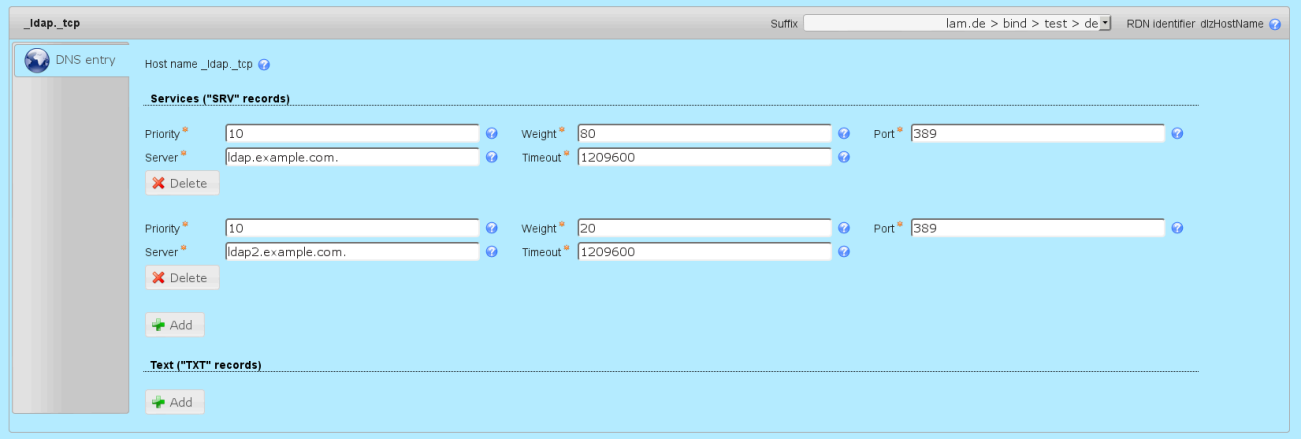
Service records can be used to specify which servers provide common services such as LDAP. Please note that the host name must be _SERVICE._PROTOCOL (e.g. _ldap._tcp).

Priority: The priority of the target host, lower value means more preferred.

Weight: A relative weight for records with the same priority. E.g. weights 20 and 80 for a service will result in 20% queries to the one server and 80% to the other.

Port: The port number that is used for your service.

Server: DNS name where service can be reached (with dot at the end).



File upload

You can upload complete DNS zones via LAM's file upload. Here is an example for a zone file and the corresponding CSV file.

Table 4.2. Zone file

@	IN	SOA	ns1.example.com admin.ns1.example.com (1 360000 3600 3600000 370000)
	IN	NS	ns1.example.com.
	IN	NS	ns2.example.com.
	IN	MX	10 mail1.example.com
	IN	MX	20 mail2.example.com
foo	IN	A	123.123.123.100
foo2	IN	CNAME	foo.example.com
bar	IN	A	123.123.123.101
	IN	AAAA	1:2:3:4:5

Please check that you have an existing zone entry that can be used for the file upload. See above to create a new zone.

Hint: If you use the function above to create a new zone then please skip the "@" entry in the CSV file below. LAM creates this entry with sample data.

In this example we assume that the following zone extry exists:

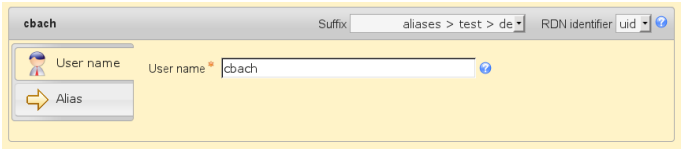
dn: dlzZoneName=example.com,ou=bind,dc=example,dc=com
dlzzonename: example.com
objectclass: dlzZone
objectclass: top

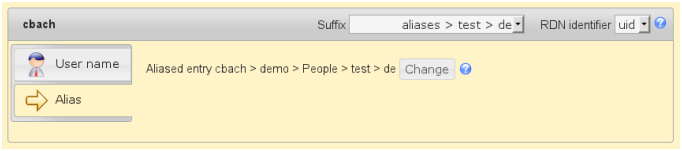
Here is the corresponding CSV file: bindUpload.csv [resources/bindUpload.csv]

Aliases (LAM Pro)

Some applications use the object class "alias" to link LDAP entries to other parts of the LDAP tree. Activate the account type "Aliases" in your LAM server profile to use this account type.

Currently, only user accounts can be aliased with the "uidObject" object class.

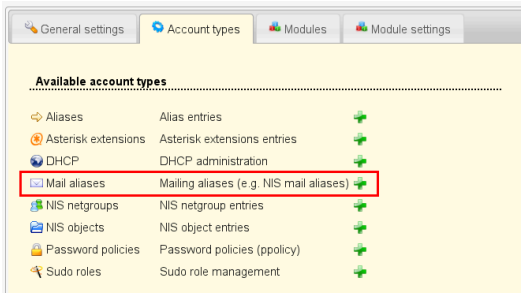




Mail aliases

You can manage mail aliases (e.g. for NIS) inside LAM. This can be used to replace local /etc/aliases files with LDAP.

To activate this type please add "Mail aliases" in your LAM server profile:

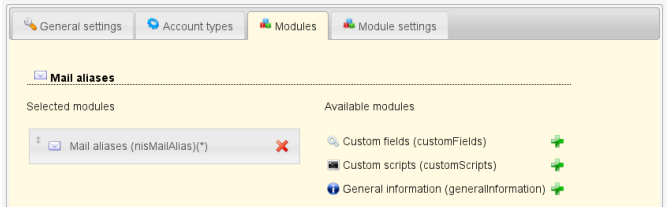


NIS mail aliases

Note: Use the mail alias user module to manage mail aliases on user pages.

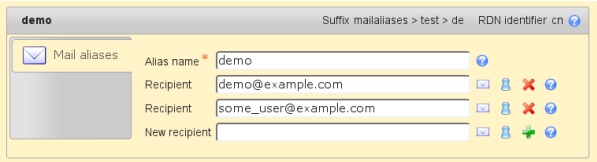
All accounts of this type are based on the "nisMailAlias" object class and may have "cn" and "rfc822MailMember" attributes.

You need to select the Mail aliases module on the next tab.



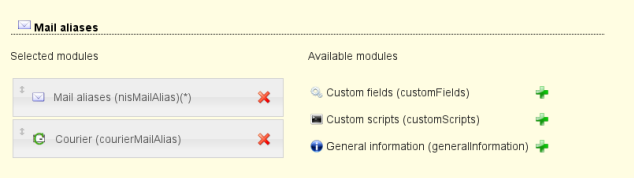
The mail aliases will then appear as separate tab inside LAM. You may then manage the aliases with their names and recipient addresses.

There are mail/user icons that allow to select a mail address/user name from the existing users.

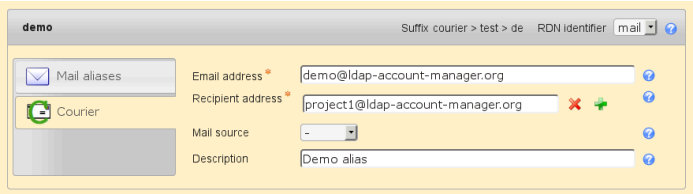


Courier mail aliases

Mail aliases for Courier SMTP can be used when activating NIS mail aliases and Courier modules:



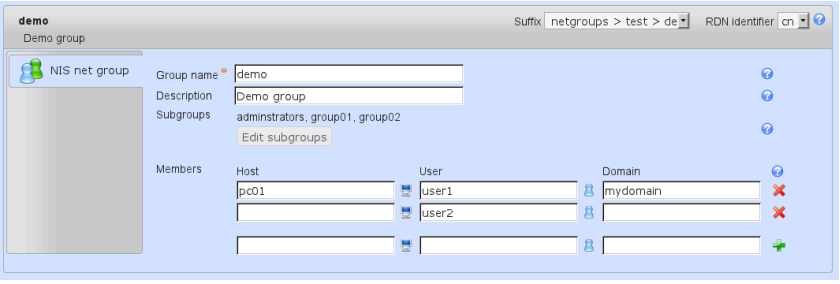
You will then get the Courier tab for your mail aliases.



NIS net groups

LAM supports to define NIS netgroups. You can use them e.g. to restrict SSH access to your machines.

Add the NIS net group account type and its module to your server profile. Then you can manage net groups in LAM. Net groups may contain other net groups as child groups. You can either insert the host/user names manually or print the search buttons next to the input fields to find existing entries in your directory.



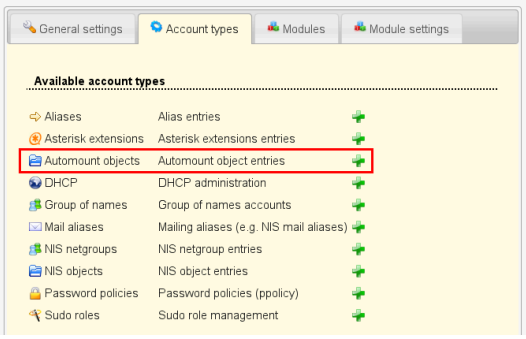
NIS objects (LAM Pro)

You can manage NIS objects with LAM Pro. This allows you define network mount points in LDAP.

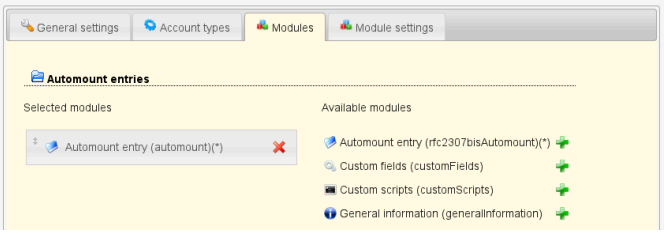
Add the NIS objects type to your LAM configuration and then the NIS objects module. This will add the NIS objects tab to LAM.

Automount objects (LAM Pro)

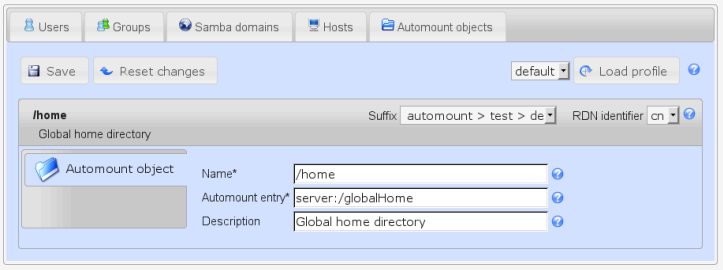
LAM Pro allows you to manage automount entries. Please activate the account type "Automount objects" in your LAM Pro server profile.



Then add the correct automount module. Usually, this is "Automount entry (automount)". If you use Suse Linux with RFC2307bis schema please select "Automount entry (rfc2307bisAutomount)".



This will add a new tab to LAM Pro's main screen which includes a list of all automount entries. Here you can easily create new entries.



Please see the following external HowTos for more information on automounting and LDAP:

- AutofsLDAP [https://help.ubuntu.com/community/AutofsLDAP]
- Automount über LDAP (German) [http://www.pro-linux.de/artikel/2/760/automount-ueber-ldap.html]

Oracle databases (LAM Pro)

Oracle allows to manage connection data that is stored in tnsnames.ora to be stored in an LDAP directory.

Initial setup

LDAP server setup:

You will need to install the correct Oracle LDAP schema files on your LDAP server. If you run no Oracle LDAP server then you can get them (oidbase.schema, oidnet.schema, oidrdbms.schema, alias.schema) e.g. from here [http://www.idevelopment.info/data/Oracle/DBA_tips/LDAP/LDAP_8.shtml].

Next you need to create the root entry for Oracle. It should look like this:

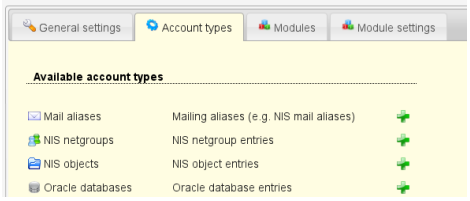
```
dn: cn=OracleContext,dc=example,dc=com
```

```
objectclass: orclContext
cn: OracleContext
```

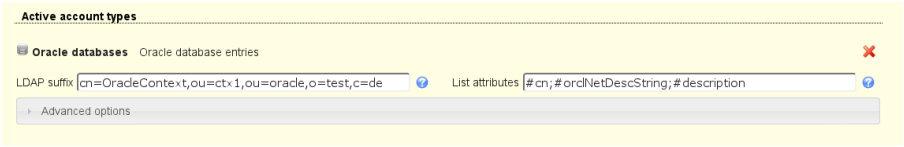
You can create it with LAM's tree view. Please note that "cn" must be set to "OracleContext".

LAM setup:

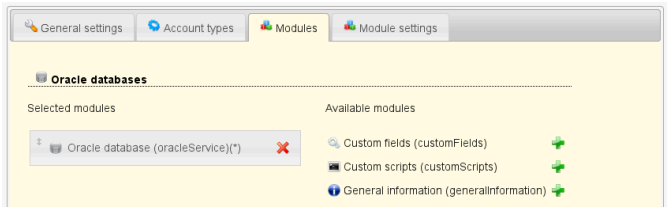
Edit your LAM server profile and add the Oracle account type:



In case you manage a single Oracle context just enter the cn=OracleContext entry as LDAP suffix. If you manage multiple Oracle context entries then set the LDAP suffix to a parent entry of them.



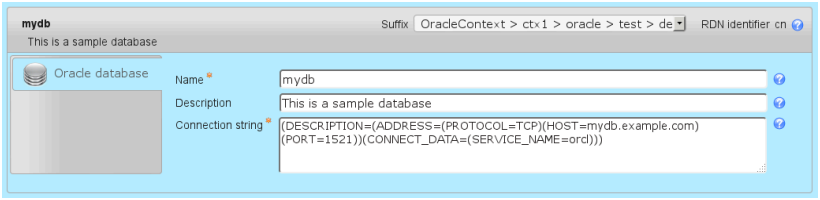
Next, add the Oracle module:



Now you can login to LAM and start to add database entries.

Managing database entries

Each database has a service name, the connection string and an optional description.



Database client setup for LDAP

You need to activate the LDAP adapter to make the database tools reading LDAP. Edit network/admin/sqlnet.ora like this:

```
NAMES.DIRECTORY_PATH= (TNSNAMES, LDAP)
```

Then add a file called ldap.ora next to your sqlnet.ora and set the LDAP server and DN suffix where cn=OracleContext is stored:

```
DIRECTORY_SERVERS= (ldap.example.com:389:636)
DEFAULT_ADMIN_CONTEXT = "ou=ctx1,ou=oracle,o=test,c=de"
DIRECTORY_SERVER_TYPE = OID
```

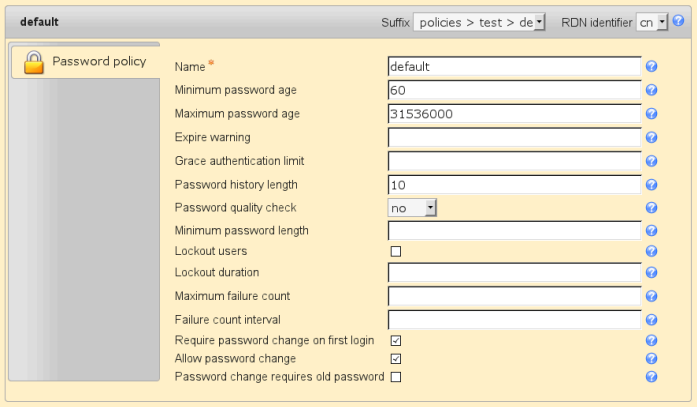
This will allow e.g. tnsping to get the connection data from LDAP:

```
[oracle@oracle bin]$ tnsping mydb

TNS Ping Utility for Linux: Version 12.1.0.1.0 - Production on 09-FEB-2014 18:06:54

Copyright (c) 1997, 2013, Oracle.  All rights reserved.

Used parameter files:
/home/oracle/app/oracle/product/12.1.0/dbhome_1/network/admin/sqlnet.ora

Used LDAP adapter to resolve the alias
Attempting to contact (DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)(HOST=mydb.example.com)(PORT=
OK (10 msec)
```

Password policies (LAM Pro)

OpenLDAP supports the ppolicy [http://linux.die.net/man/5/slapo-ppolicy] overlay to manage password policies for LDAP entries. This allows you to set password policies which are independent from your applications. The policies are managed internally by the LDAP server.

You can manage these policies with LAM Pro with the account type "Password policies".

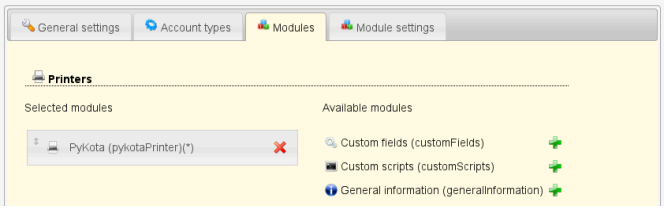


You will need to add the ppolicy schema to your OpenLDAP configuration and activate the ppolicy [http://linux.die.net/man/5/slapo-ppolicy] overlay module in slapd.conf to use this feature.

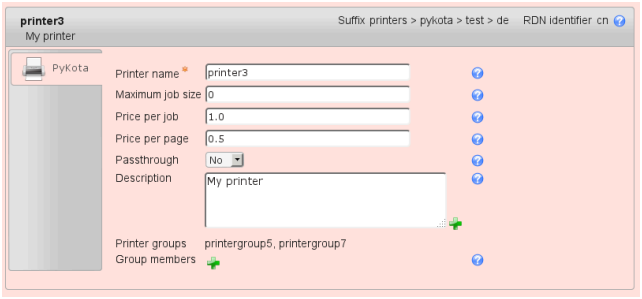
PyKota printers

Please add the account type "Printers (PyKota printers)" on tab "Account types" in your server profile and setup the LDAP suffix where printers are stored.

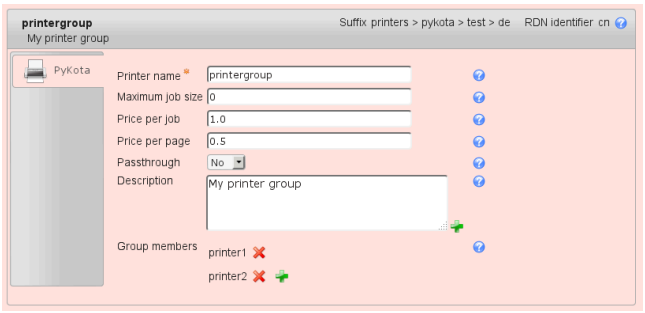
Then add the PyKota printer module on tab "Account modules".



Next you can start managing printers inside LAM. Here you can setup the costs for a print job. LAM will also show if the printer is member of any printer groups.

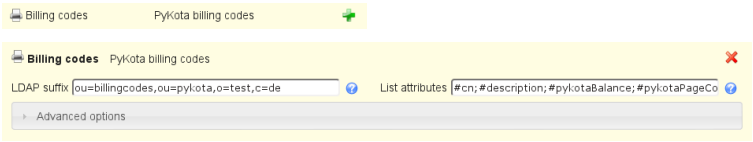


You can also setup printer groups. Just add some members to your new group.

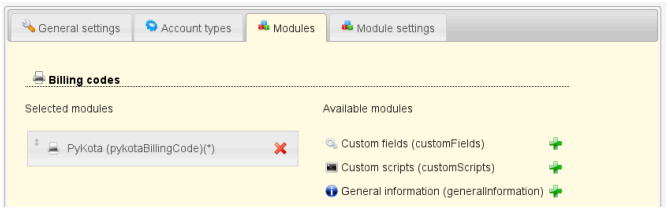


PyKota billing codes

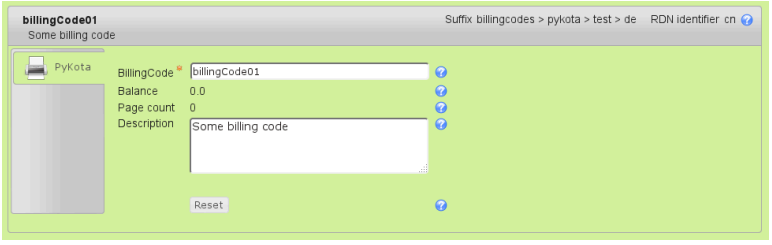
Please add the account type "Billing codes" on tab "Account types" in your server profile and setup the LDAP suffix where billing codes are stored.



Then add the PyKota billing code module on tab "Account modules".



Now login to LAM and you will see the billing code tab where you can manage your entries. If jobs were printed with a billing code then you will also see the balance and page count.



Custom fields (LAM Pro)

This module allows you to manage LDAP attributes that are not covered by the other LAM modules (e.g. if you use custom LDAP schemas). You can fully define how your input fields look like:

- Label
- LDAP attribute name
- Unique name for field
- Help text
- Read-only display
- Field type: text, password, text area, checkbox, radio buttons, select list, file upload
- Validation via regular expression
- Error message if validation fails

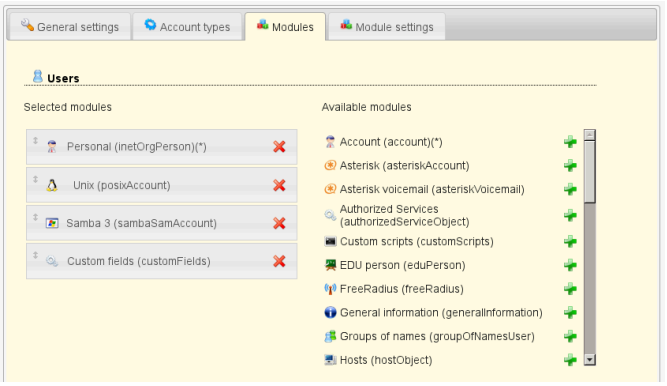
Limitations:

Custom fields cannot manage

- structural object classes
- attributes that require validation rules across multiple attributes or cannot be described by a simple regular expression

Activating the custom fields module:

You may specify custom fields for all of your account types. Please enter tab "Modules" in your server profile. Now activate the "Custom fields (customFields)" module for all needed account types.

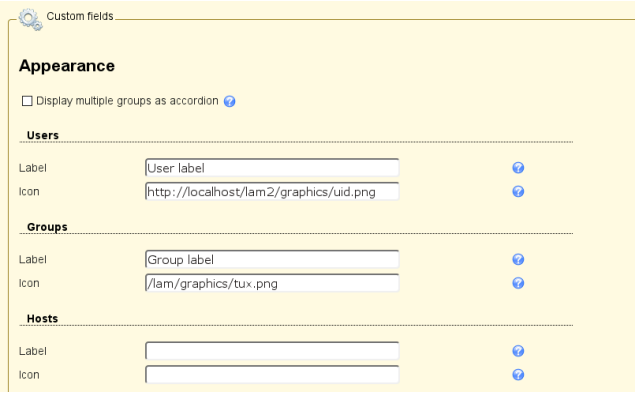


Setting label and icon:

You may set the label that is displayed e.g. on the tab when editing an account. It is also possible to specify an icon (must be a valid URL like "/images/icon.png" or "http://server/images/icon.png"). The icon size should be 32x32 pixels.

LAM will display a default icon and "Custom fields" as label if you do not enter any values.

You may also specify how LAM displays cutom fields when there are multiple field groups. The default is accordion view where you can switch field groups by clicking on the title. You may also deactivate this mode. Then all field groups are displayed one below the other.

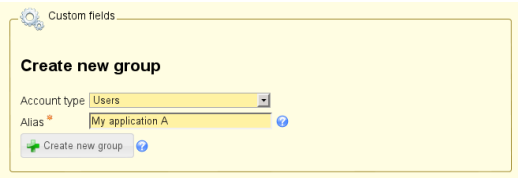


Defining groups:

All input fields are devided into groups. A group may contain one or more object classes and allows you to add/remove a certain set of input fields.

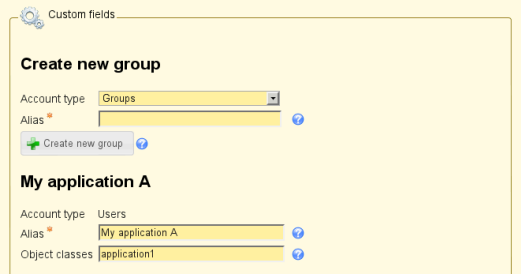
E.g. you may define two groups - "My application A" and "My application B" - that manage different LDAP attributes and object classes. This way you will be able to control both attribute sets independently.

To create a group please edit your server profile and switch to tab "Module settings". You will see the section "Custom fields" which allows you to add new groups. Now select your account type (e.g. Users) and specify an alias for your group. This alias will be printed as group header when you later edit an account in the admin interface.

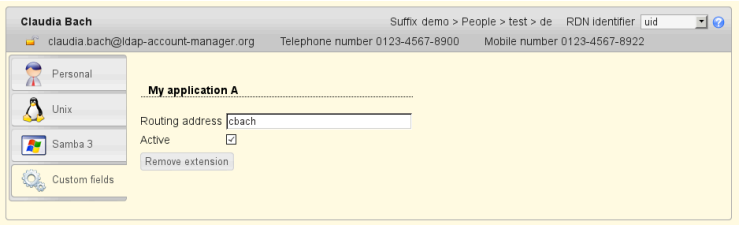


After you created your new group you can setup the managed object classes. If you specify any object classes then you will later be able to add/remove a complete set of attributes including their object classes.

Skipping the object classes field is only useful if you want to manage some attributes that are not yet supported by LAM but there is already a LAM module that manages the object class.



The group may look like when you edit a user.



Adding fields:

Now you can add a new field that manages an LDAP attribute. Simply fill the fields and press on "Add".

Please note that the field name cannot be changed later. It is the unique ID for this field.

Examples for fields and their representation:

Text field:

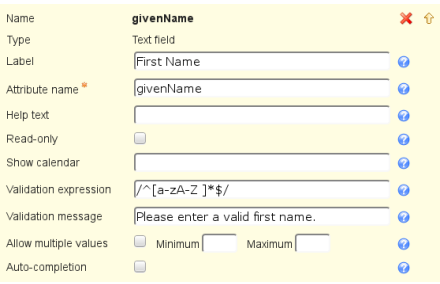
Text fields allow to specify a validation expression and error message.

You can also enable auto-completion. In this case LAM will search all accounts for the given attribute and provide auto-completion hints when the user edits this field. This should only be used if there is a limited number of different values for this attribute.

In case your field is a date value you can show a calendar for easy editing.

Example calendar formats:

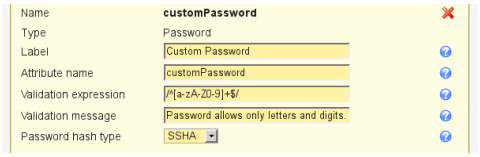
- dd.mm.yy: 31.12.2016
- yy-mm-dd: 2016-12-31
- d M, y: 31 Dec, 16
- d MM, y: 31 December, 2016



Presentation:

Password field:

You can also manage custom password fields. LAM Pro will display two fields where the user must enter the same password. You can hash the password if needed.

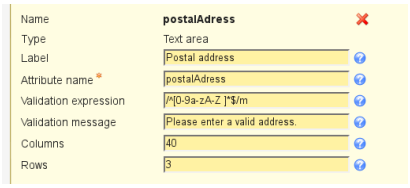


Presentation:

Text area:

This adds a multi-line field. The options are similar to text fields. Additionally, you can set the size with the number of columns and rows.

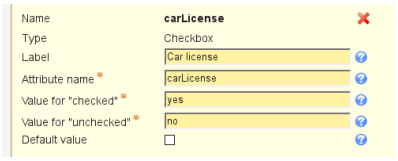
Please note that the validation expression should be set to multi-line. This is done by adding "m" at the end.



Presentation:

Checkbox:

Sometimes you may want to allow only yes/no values for your LDAP attributes. This can be represented by a checkbox. You can specify the values for checked and unchecked. The default value is set if the LDAP attribute has no value.

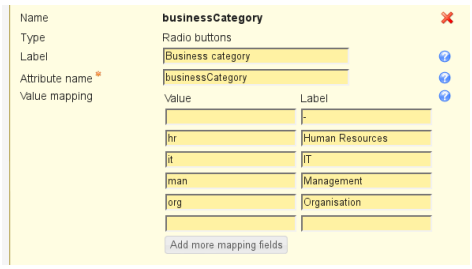


Presentation:

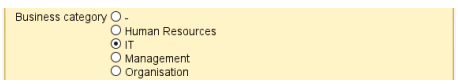
Radio buttons:

This displays a list of radio buttons where the user can select one value.

You can specify a mapping of LDAP attribute values and their display (label) on the Self Service page. To add more mapping fields please press "Add more mapping fields".



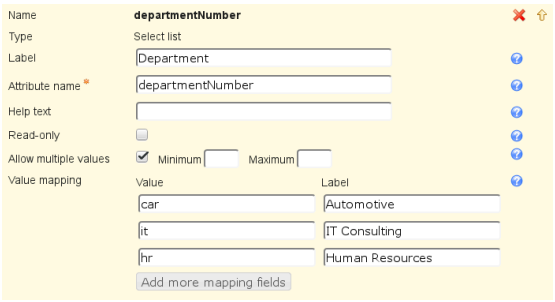
Presentation:



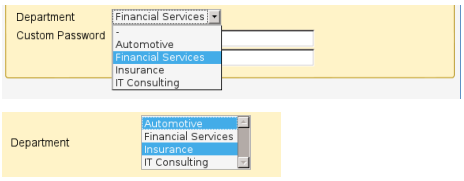
Select list:

Select lists allow the user to select a value in a large list of options. The definition of the possible values and their display is similar to radio buttons.

You can also allow multiple values.

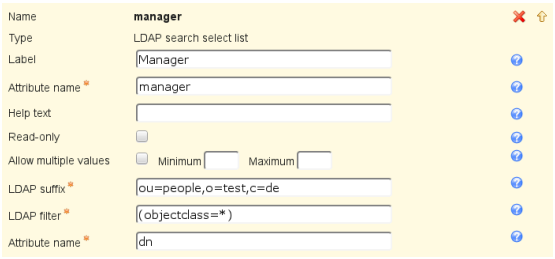


Presentation:



LDAP search select list

This is similar to "Select list" but the option are read from LDAP. You can use this to define e.g. a DN selection list. Multiple values are supported.

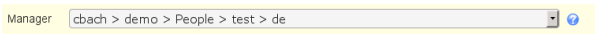


LDAP suffix: The LDAP DN that is used as starting point to search for LDAP entries.

LDAP filter: Only LDAP entries that match this filter will be used. If all entries should be used then use "(objectclass=*)".

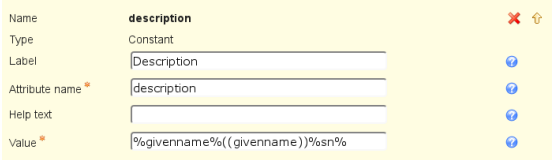
Attribute name: The values of this attribute will be used to build the selection list.

Presentation:



Constant value

This will set the attribute to a constant value. You can also specify wildcards to inject other attribute's values.



Wildcards:

- %attribute%: attribute value

- @attribute@: first character of attribute
- ?attribute?: first character of attribute in lower case
- !attribute!: first character of attribute in upper case
- ??attribute??: attribute in lower case
- !!attribute!!: attribute in upper case
- ((attribute)): space if attribute is set
- §attribute|;§; attribute values separted by ";" (you can set other separators if you want)

Examples for attributes gn="Steve", sn="Miller" and memberUid=("user1", "user2") (specified value -> resulting LDAP value):

Table 4.3.

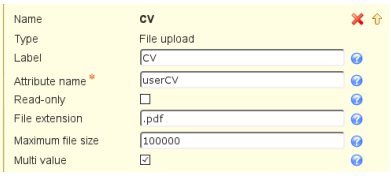
Constant value	Resulting LDAP value
my constant	my constant
%gn%	Steve
%gn%((gn))%sn%	Steve Miller (would be "Miller" if gn is empty)
§memberUid|, §	user1, user2

Presentation:

The LDAP value will be shown as text.

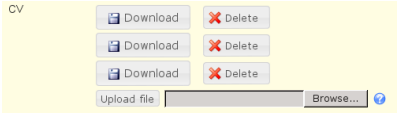
File upload:

This is used for binary data. You can restrict uploaded data to a given file extension and set the maximum file size.



Presentation:

The uploaded data may also be downloaded via LAM.



Validation expressions:

The validation expressions follow the standard of Perl regular expressions [http://perldoc.perl.org/perlre.html]. They start and end with a "/". The beginning of a line is specified by "^" and the end by "$".

Examples:

/^[a-z0-9]+$/ allows small letters and numbers. The value must not be empty ("+").

/^[a-z0-9]+$/i allows small and capital letters ("i" at the end means ignore case) and numbers. The value must not be empty ("+").

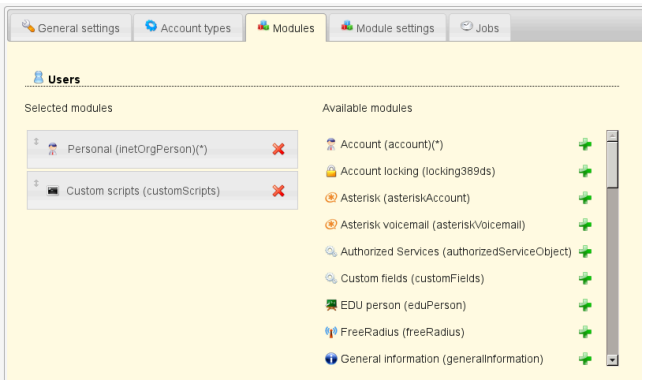
Special characters that must be escaped with "\": "\", ".", "(", ")"

E.g. /^[a-z0-9\.]$/i

Custom scripts (LAM Pro)

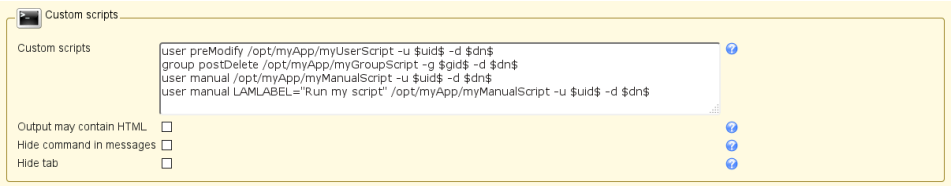
LAM Pro allows you to execute scripts whenever an account is created, modified or deleted. This can be useful to automate processes which needed manual work afterwards (e.g. sending your user a welcome mail or register a mailbox). Additionally, you can specify manual scipts that can be executed from within LAM Pro.

To activate this feature please add the "Custom scripts" module to all needed account types on the configuration pages.



In "Module settings" you can specify multiple scripts for each action type (e.g. modify) and account type (e.g. user). The scripts need to be located on the filesystem of your webserver and will be executed in its user environment. E.g. if you webserver runs as user www-data with the group www-data then the custom scripts will be run under this user with his rights. The output of the scripts will be shown in LAM.

You can specify the scripts on the LAM configuration pages.



Syntax:

Please enter one script per line. Each line has the following format: <account type> <action> <script>

E.g.: user preModify /usr/bin/myCustomScript -u uid

Account types:

You can setup scripts for all available account types (e.g. user, group, host, ...). Please see the help on the configuration page about your current active account types.

Actions:

Table 4.4. Action types

Action name	Description

preCreate	Executed before creating a new account (cancels operation if a script returns an exit code > 0, not available for file upload)
postCreate	Executed after creating a new account (does **not** run if preCreate or LDAP operations fail)
preModify	Executed before an account is modified (cancels operation if a script returns an exit code > 0)
postModify	Executed after an account was modified (does **not** run if preModify or LDAP operations fail)
preDelete	Executed before an account is modified (cancels operation if a script returns an exit code > 0)
postDelete	Executed after an account was modified (does **not** run if preDelete or LDAP operations fail)
manual	Can be run manually on account page. If you add LAM-LABEL="text" before the command then LAM will use the text as label for the button in account edit screen.

Script:

You can execute any script which is located on the filesystem of your webserver. The path may be absolute or relative to the PATH-variable of the environment of your webserver process. It is also possible to add commandline arguments to your scripts. Additionally, LAM will resolve wildcards to LDAP attributes. If your script includes an wildcard in the format $ATTRIBUTE$ then LAM will replace it with the attribute value of the current LDAP entry. The values of multi-value attributes are separated by commas. E.g. if you create an account with the attribute "uid" and value "steve" then LAM will resolve "uid" to "steve".

Please note that manual scripts can only use the current LDAP attribute values of the account. Any modifications done that are not saved will not be available. Manual scripts are also not available for new accounts that are not yet saved to LDAP.

You can switch LAM's logging to debug mode if you are unsure which attributes with which values are available.

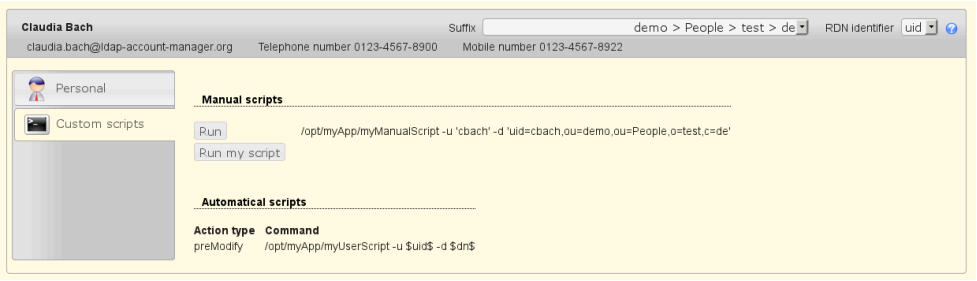
The following special wildcards are available for automatical scripts:

- **$INFO.userPasswordClearText$:** cleartext password when Unix/Windows password is changed (e.g. useful for external password synchronisation) for new/modified accounts
- **$INFO.userPasswordStatusChange$:** provides additional information if the Personal/Unix password locking status was changed, possible values: locked, unlocked, unchanged
- **$INFO.passwordSelfResetAnswerClearText$**: cleartext answer to security question
- **$INFO.389lockingStatusChange$:** for 389ds account locking, provides information if account was unlocked. Possible values: unchanged, unlocked
- **$INFO.389deactivationStatusChange$:** for 389ds account locking, provides information if account was deactivated. Possible values: unchanged, activated, deactivated
- **$NEW.<attribute>$:** the value of a new attribute (e.g. $NEW.telephoneNumber$) for modified accounts
- **$DEL.<attribute>$:** the value of a deleted attribute (e.g. $DEL.telephoneNumber$) for modified accounts
- **$MOD.<attribute>$:** the new value of a modified attribute (e.g. $MOD.telephoneNumber$) for modified accounts
- **$ORIG.<attribute>$:** the original value of an attribute (e.g. $ORIG.telephoneNumber$) for modified accounts

Output may contain HTML: If your scripts generate HTML output then activate this option.

Hide command in messages: You may want to prevent that your users see the executed commands. In this case activating this option will only show the command output but not the command itself.

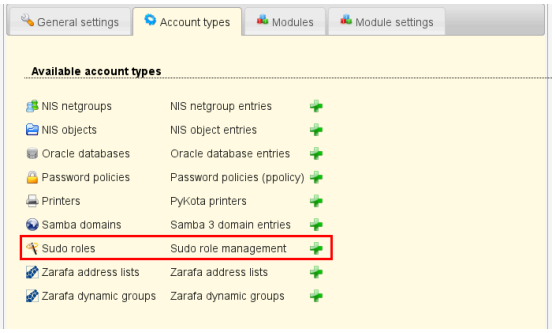
You can see a preview of the commands which will be automatically executed on the "Custom scripts" tab. Here you can also run the manual scripts.

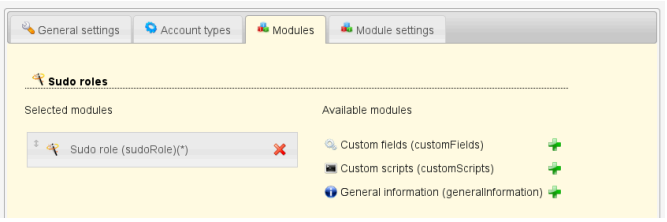


Sudo roles (LAM Pro)

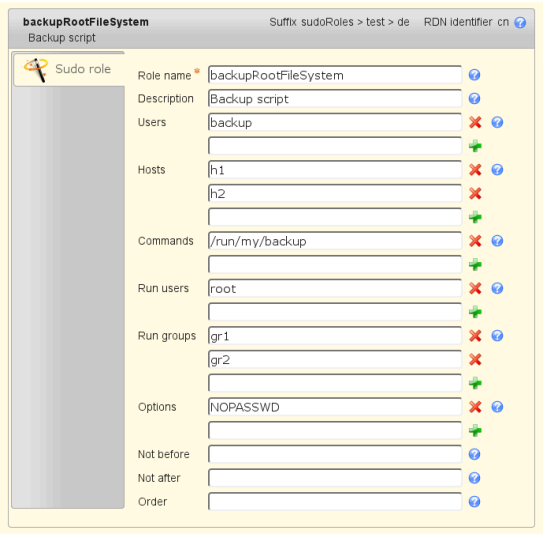
You can manage your sudo roles in LDAP if you have installed the sudo-ldap package or compiled sudo with LDAP support [http://www.sudo.ws/sudo/readme_ldap.html].

To activate sudo management in LAM Pro edit your server profile and add the type "Sudo roles".





Now you can create sudo commands.



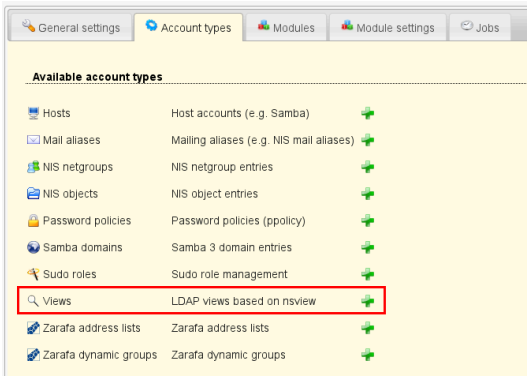
The sudo roles in LDAP work similar to those in /etc/sudoers. You can specify who may run which commands as which user. It is also possible to specify options like NOPASSWD.

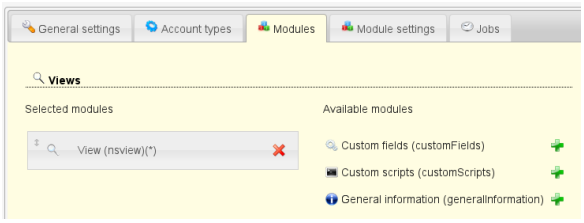
LDAP views based on nsview (LAM Pro)

LAM Pro supports LDAP views based on the "nsview" object class. These views allow to create an organizational unit that shows a subset of your LDAP content. The subset is determined by an LDAP filter.

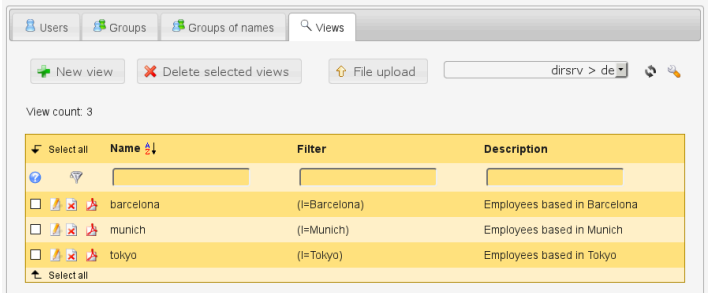
Configuration:

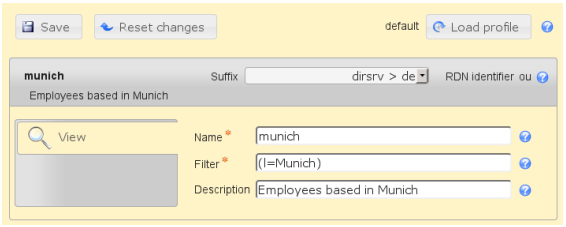
To activate view management in LAM Pro edit your server profile and add the type "LDAP views".





Now you are ready to create your views. Each view has a name, LDAP filter and an optional description.

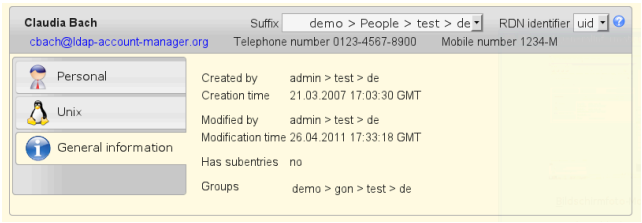




General information

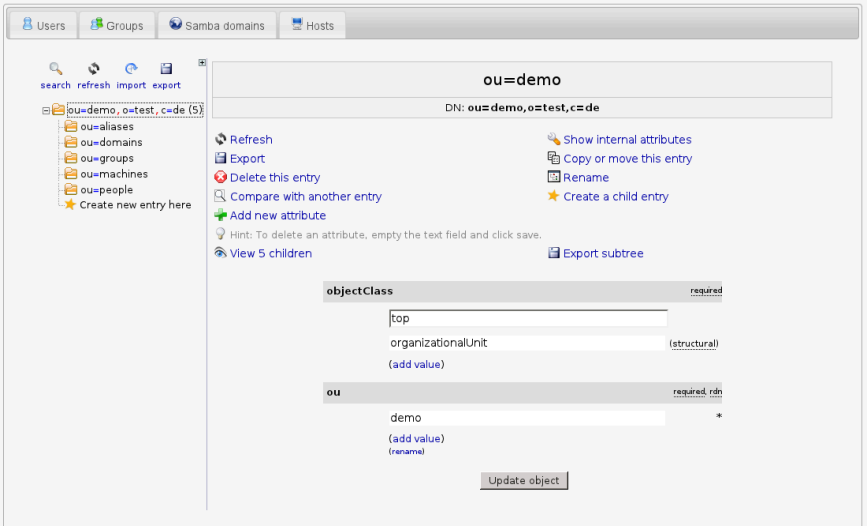
This module is available for all account types. It shows some internal information about the LDAP entries like the creation time and who modified the entry.

If you use the "memberOf" overlay in OpenLDAP then this will also show group memberships done by the overlay.



Tree view (LDAP browser)

The tree view provides a raw view on your LDAP directory. This feature is for people who are experienced with LDAP and need special functionality which the LAM account modules not provide. E.g. if you want to add a special object class to an account or edit attributes ignoring LAM's syntax checks.



There are also some special functions available:

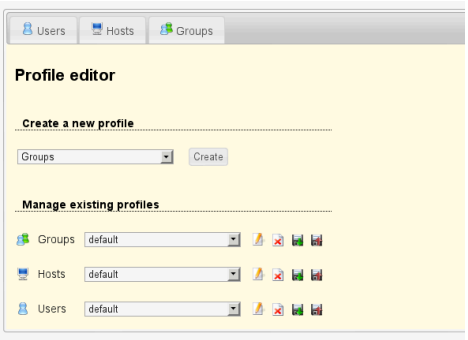
Export: This allows you to export entries to a file (e.g. LDIF or CSV format).

Show internal attributes: Shows internal attributes of the current entry. This includes information about the creator and creation time of the entry.

Chapter 5. Tools

Profile editor

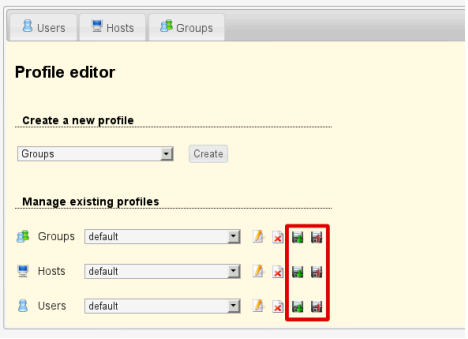
The account profiles are templates for your accounts. Here you can specify default values which can then be loaded when you create accounts. You may also load a template for an existing account to reset it to default values. When you create a new account then LAM will always load the profile named **"default"**. This account profile can include default values for all your accounts.

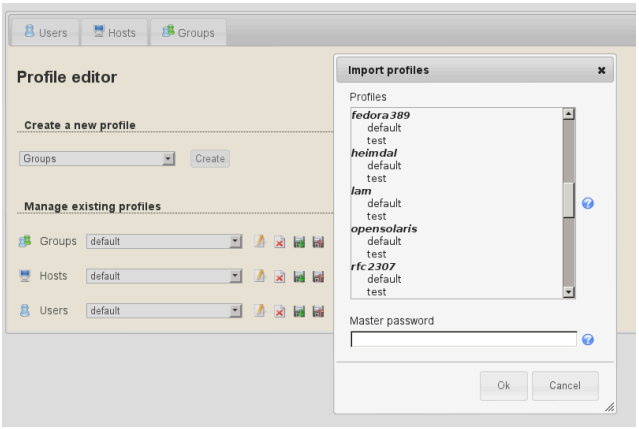


You can enter the LDAP suffix, RDN identifier and various other attributes depending on account type and activated modules.

Import/export:

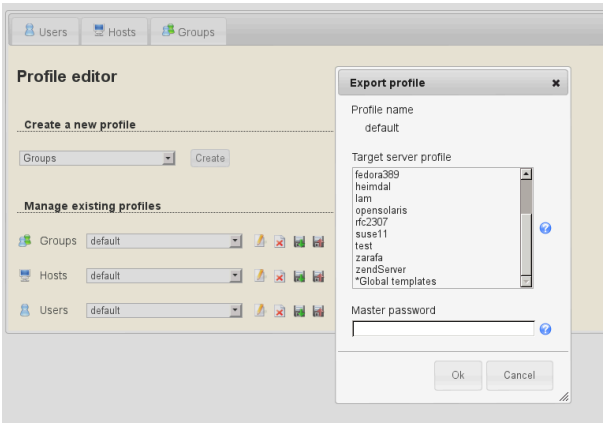
Profiles can be exported to and imported from other server profiles.





There is a special export target called "*Global templates". All profiles exported here will be copied to all other server profiles (incl. new ones). But existing profiles with the same name are not overwritten. So a profile in global templates is treated as default profile for all server profiles.

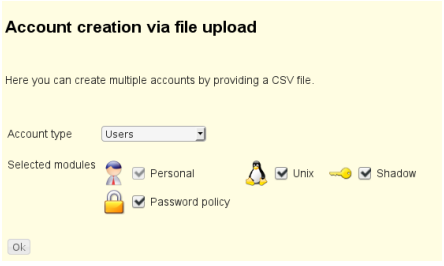
Use this if you would like to setup default profiles that are valid for all server profiles.



File upload

When you need to create lots of accounts then you can use LAM's file upload to create them. LAM will read a CSV formatted file and create the related LDAP entries. Please check the data in you CSV file carefully. LAM will do less checks for the file upload than for single account creation.

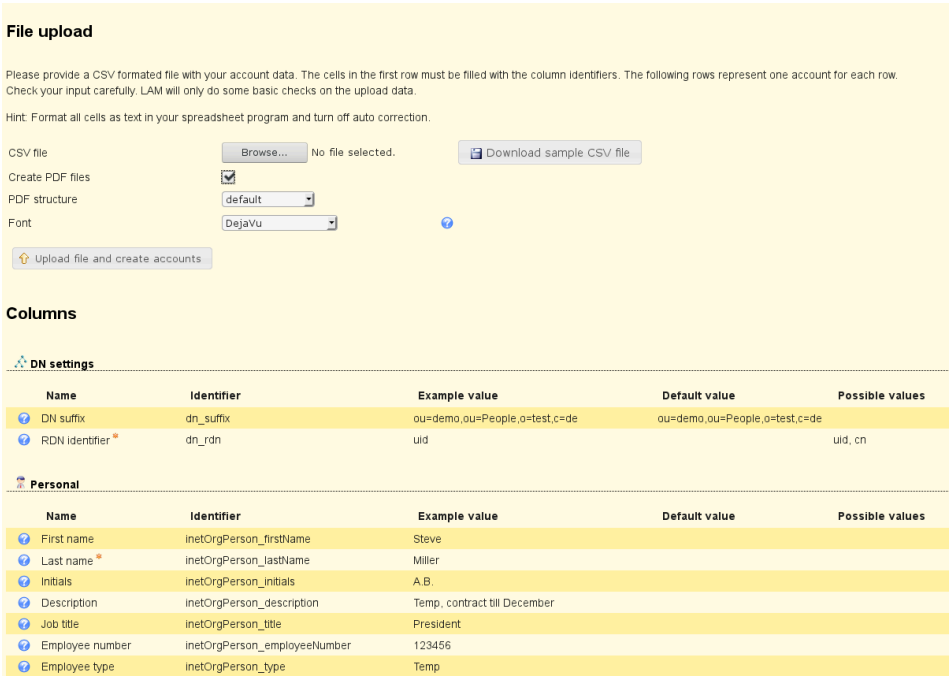
At the first page please select the account type and what extensions should be activated.



The next page shows all available options for the file upload. You will also find a sample CSV file which can be used as template for your CSV file. All red options are required columns in the file. You need to specify a value for each account.

When you upload the CSV file then LAM first does some checks on this file. This includes syntax checks and if all required data was entered. No changes in the LDAP directory are done at this time.

If the checks were successful then LAM will ask again if you want to create the accounts. You will also have the chance to check the upload by viewing the changes in LDIF format.



Multi edit

This tool allows you to modify a large list of LDAP entries in batch mode. You can add new attributes/object classes, remove attributes and set attributes to a specific value.

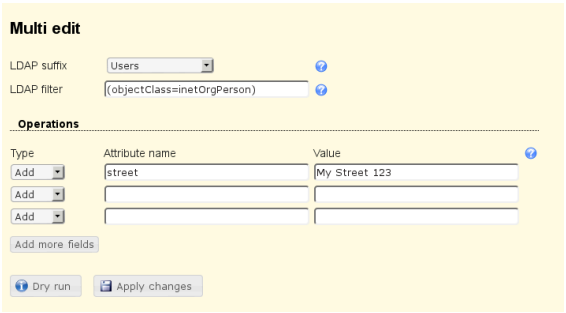
At the beginning, you need to specify where the entries are stored that should be changed. You can select an account suffix, the tree suffix or enter your own DN by selecting "Other".

Next, enter an additional LDAP filter to limit the entries that should be changed. E.g. use "(objectclass=inetOrgPerson)" to filter for users. You may also enter e.g. "(!(objectClass=passwordSelfReset))" to match all accounts that do not yet have the password self reset feature.

Now, it is time to define the changes that should be done. The following operations are possible:

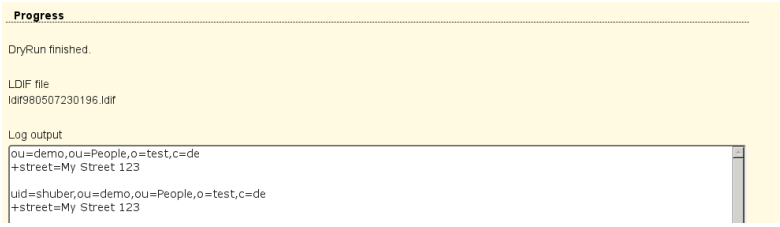
- Add: Adds an attribute value if not yet existing. Please do not use for single-value attributes that already have a value.
- Modify: Sets an attribute to the given value. If the attribute does not yet exist then it is added. If the attribute has multiple values then all other values are removed.
- Delete: Deletes the specified value from this attribute. If you leave the value field blank then all attribute values are removed.

Please note that all actions are run as separate LDAP commands. You cannot add an object class and a required attribute at the same time.



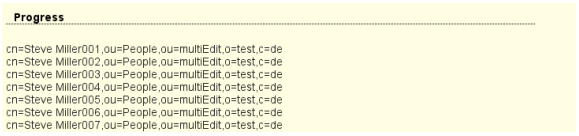
Dry run

You should always start with a dry run. It will not do any changes to your LDAP directory but print out all modifications that will be done. You will also be able to download the changes in LDIF format to use with ldapmodify. This is useful if you want to adjust some actions manually.



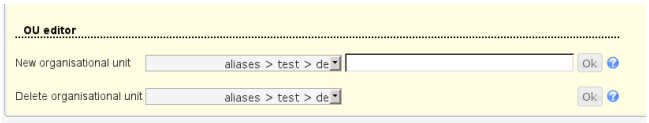
Apply changes

This will run the actions against your LDAP directory. You will see which accounts are edited in the progress area and also if any errors occured.



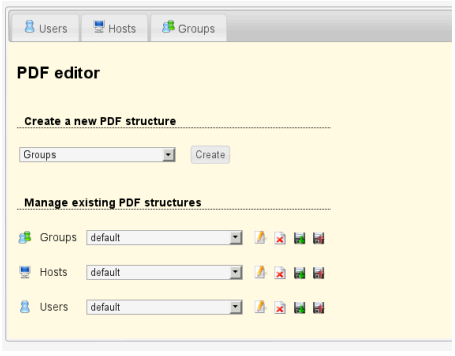
OU editor

This is a simple editor to add/delete organisational units in your LDAP tree. This way you can structure the accounts.

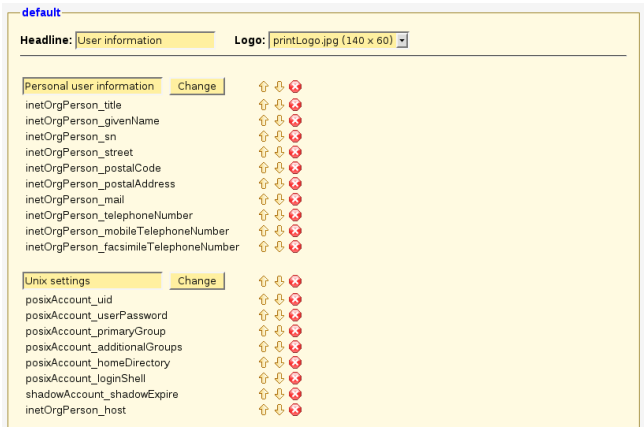


PDF editor

All accounts in LAM may be exported as PDF files. You can specify the page structure and displayed information by editing the PDF profiles.



When you export accounts to PDF then each account will get its own page inside the PDF. There is a headline on each page where you can show a page title. You may also add a logo to each page. To add more logos please use the logo management on the PDF editor main page.

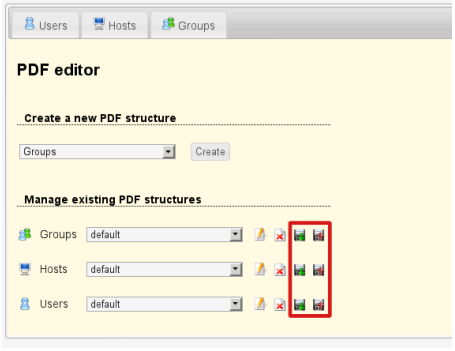


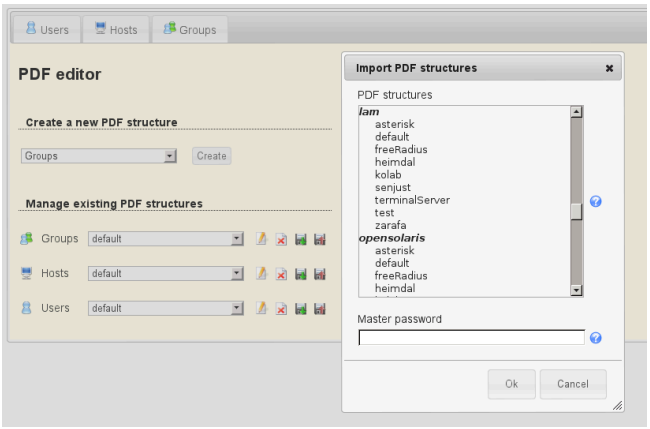
The main part is structured into sections of information. Each section has a title. This can either be static text or the value of an attribute. You may also insert a static text block as section. Sections can be moved by using the arrows next to the section title.

Each section can contain multiple fields which usually represent LDAP attributes. You can simply add new fields by selecting the field name and its position. Then use the arrows to move the field inside the section.

Import/export:

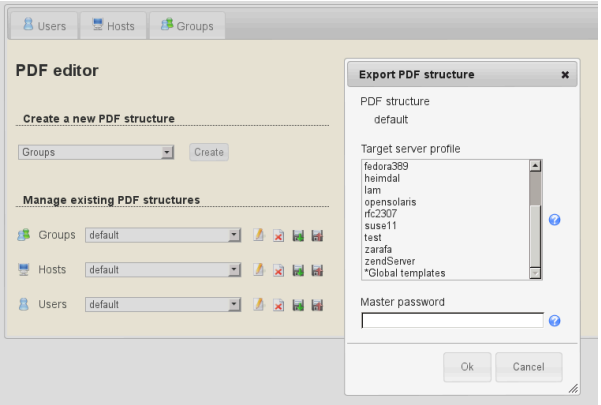
PDF structures can be exported to and imported from other server profiles.





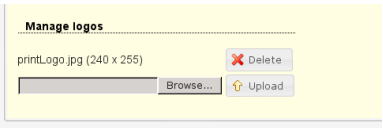
There is a special export target called "*Global templates". All PDF structures exported here will be copied to all other server profiles (incl. new ones). But existing PDF structures with the same name are not overwritten. So a PDF structure in global templates is treated as default structure for all server profiles.

Use this if you would like to setup default PDF structures that are valid for all server profiles.



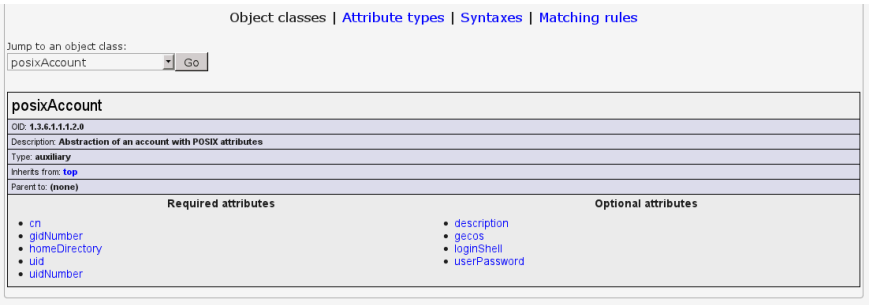
Logo management:

You can upload image files to put a custom logo on the PDF files. The image file name must end with .png or .jpg and the size must not exceed 2000x300px.



Schema browser

Here you browse the schema of your LDAP server. You can view what object classes, attributes, syntaxes and matching rules are available. This is useful if you need to check if a certain object class is available.



Server information

This shows information and statistics about your LDAP server. This includes the suffixes, used overlays, connection data and operation statistics. You will need "cn=monitor" setup to see all details. Some data may not be available depending on your LDAP server software.

Please see the following links how to setup "cn=monitor":

- OpenLDAP [http://www.openldap.org/doc/admin24/monitoringslapd.html]
- 389 server [http://directory.fedoraproject.org/wiki/Howto:CN%3DMonitor_LDAP_Monitoring]

Server information

Managed suffixes	o=test,c=de
LDAP version	3
Config suffix	cn=config
Schema suffix	cn=Subschema
Dynamic subtrees	o=test,c=de
SASL mechanisms	CRAM-MD5, DIGEST-MD5, NTLM
Name	OpenLDAP: slapd 2.4.25 (Apr 11 2011 20:13:50)
Listeners	IP=0.0.0.0:389, IP=[::]:389, IP=0.0.0.0:636, IP=[::]:636, PATH=/var/run/slapd/ldapi
Backends	config, ldif, bdb, monitor
Overlays	memberof, dds, ppolicy, glue
Max. file descriptors	1024

Server statistics

LDAP entries	26755
Referrals	0
Start time	20.05.2011 14:19:34 GMT
Server time	20.05.2011 17:37:15 GMT
Uptime	0:3:17

Connection statistics

Current connections	9
Total connections	1163
Bytes sent	3.51MB
PDUs sent	27473

Operation statistics

	Initiated	**Completed**
Bind	182	182
Unbind	142	142
Search	525	524
Add	0	0
Modify	10	10
Delete	0	0
Modify RDN	0	0
Compare	0	0
Abandon	0	0
Extended	3	3
Total	862	861

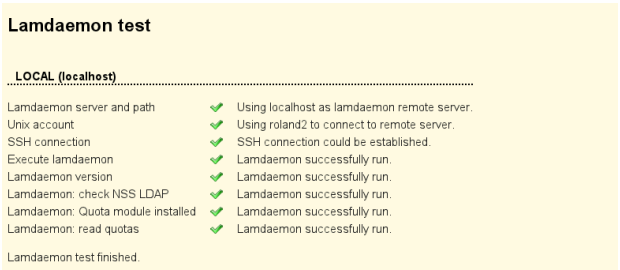
Tests

This allows you to check if your LDAP schema is compatible with LAM and to find possible problems.

Lamdaemon test

LAM provides an external script to manage home directories and quotas. You can test here if everything is setup correctly.

If you get an error like "no tty present and no askpass program specified" then the path to the lamdaemon.pl may be wrong. Please see the lamdaemon installation instructions for setup details.



Lamdaemon test

LOCAL (localhost)

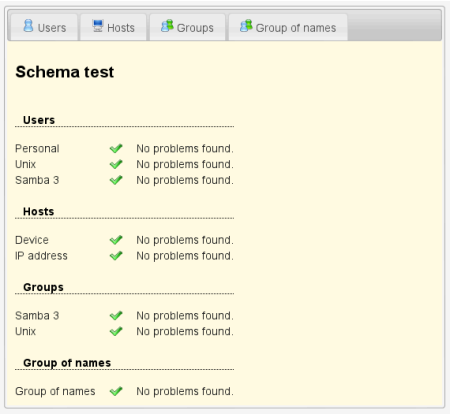
Lamdaemon server and path	✔ Using localhost as lamdaemon remote server.
Unix account	✔ Using roland2 to connect to remote server.
SSH connection	✔ SSH connection could be established.
Execute lamdaemon	✔ Lamdaemon successfully run.
Lamdaemon version	✔ Lamdaemon successfully run.
Lamdaemon: check NSS LDAP	✔ Lamdaemon successfully run.
Lamdaemon: Quota module installed	✔ Lamdaemon successfully run.
Lamdaemon: read quotas	✔ Lamdaemon successfully run.

Lamdaemon test finished.

Schema test

This will test if your LDAP schema supports all object classes and attributes of the active LAM modules. If you get a message that something is missing please check that you installed all required schemas.

If you get error messages about object class violations then this test can tell you what is missing.


Users
Hosts
Groups
Group of names
Schema test
Users
Personal No problems found.
Unix No problems found.
Samba 3 No problems found.
Hosts
Device No problems found.
IP address No problems found.
Groups
Samba 3 No problems found.
Unix No problems found.
Group of names
Group of names No problems found.

Chapter 6. Access levels and password reset page (LAM Pro)

You can define different access levels for each profile to allow or disallow write access. The password reset page helps your deskside support staff to reset user passwords.

Access levels

There are three access levels:

- **Write access (default)**

  There are no restrictions. LAM admin users can manage account, create profiles and set passwords.

- **Change passwords**

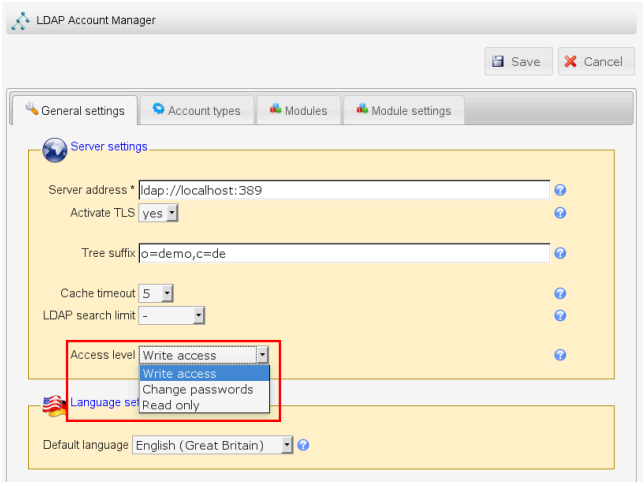
  Similar to "Read only" except that the password reset page is available.

- **Read only**

  No write access to the LDAP database is allowed. It is also impossible to manage account and PDF profiles.

  Accounts may be viewed but no changes can be saved.

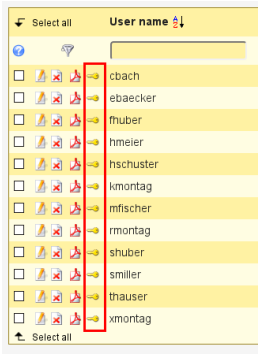
The access level can be set on the server configuration page:



Password reset page

This special page allows your deskside support staff to reset the Unix and Samba passwords of your users. Account may also be (un)locked If you set the access level to "Change passwords" then LAM will not allow any changes to the LDAP database except password changes via this page. The account pages will be still available in read-only mode.

You can open the password reset page by clicking on the key symbol on each user account:



There are three different options to set a new password. You can further restrict these options in server profile settings.

- **set random password and display it on screen**

  This will set the user's password to a random value. The password will be 11 characters long with a random combination of letters, digits and ".-_".

  You may want to use this method to tell users their new passwords via phone.

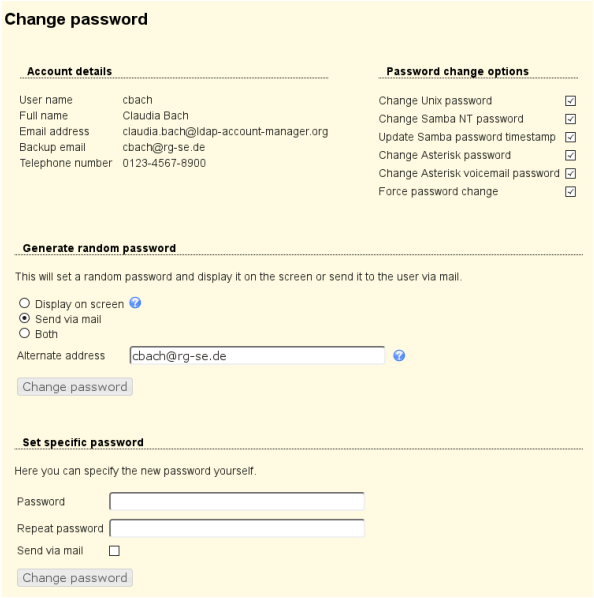
- **set random password and mail it to user**

  If the user account has set the mail attribute then LAM can send your user a mail with the new password. You can change the mail template to fit your needs. Please configure your LAM server profile to setup the sender address, subject and mail body. Please see email format option in case of broken mails. See here for setting up your SMTP server.

  Using this method will prevent that your support staff knows the new password.

- **set specific password**

  Here you can specify your own password.



LAM will display contact information about the user like the user's name, email address and telephone number. This will help your deskside support to easily contact your users.

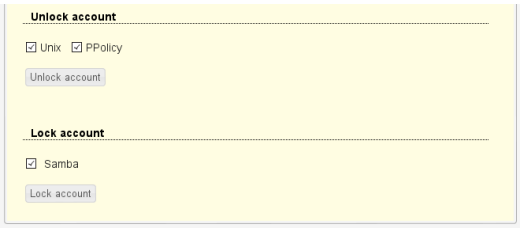
Options:

Depending on the account there may be additional options available.

- **Sync Samba NT/LM password with Unix password:** If a user account has Samba passwords set then LAM will offer to synchronize the passwords.
- **Unlock Samba account:** Locked Samba accounts can be unlocked with the password change.
- **Update Samba password timestamps:** This will set the timestamps when the password was changed (sambaPwdLastSet). Only existing attributes are updated. No new attributes are added.
- **Sync Kerberos password with Unix password:** This will also update the Heimdal Kerberos password.
- **Sync Asterisk (voicemail) password with Unix password:** Changes also the Asterisk passwords.
- **Force password change:** This will force the user to change his password at next login. This option supports Shadow, Samba 3 and PPolicy (automatically detected).

Account (un)locking:

Depending if the account includes a Unix/Samba extension and PPolicy is activated the page will show options to (un)lock the account. E.g. if the account is fully unlocked then there will be no unlocking options printed.



Chapter 7. Self service (LAM Pro)

Preparations

OpenLDAP ACLs

By default only a few administrative users have write access to the LDAP database. Before your users may change their settings you must allow them to change their LDAP data.

Hint: The ACLs below are not required if you decide to run all operations as the LDAP bind user (option "Use for all operations").

This can be done by adding ACLs to your slapd.conf or slapd.d/cn=config/olcDatabase={1}bdb.ldif which look similar to these:

access to

attrs=userPassword

by self write

by anonymous auth

by * none

access to

attrs=mail,sn,givenName,telephoneNumber,mobile,facsimileTelephoneNumber,street,postalAddress,postOfficeBox,postalCode,roomNumber,shadowLastChange,passwordSelfResetAnswer,passwordSelfResetQuestion,passwordSelfResetBackupMail

by self write

by * read

If you do not want them to change all attributes then reduce the list to fit your needs. Some modules may require additional LDAP attributes. You can use the tree view to get the technical attribute names e.g. by selecting an user account.

Usually, the slapd.conf file is located in /etc/ldap or /etc/openldap.

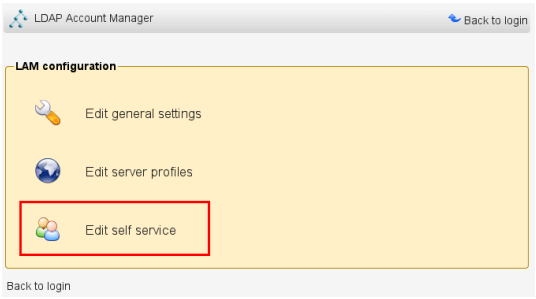
Other LDAP servers

There exist many LDAP implementations. If you do not use OpenLDAP you need to write your own ACLs. Please check the manual of your LDAP server for instructions.

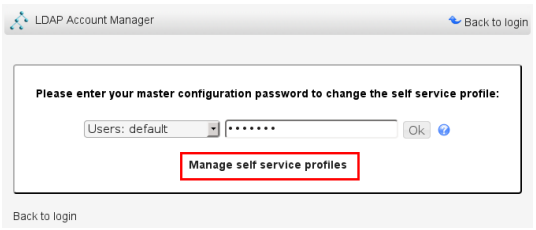
Creating a self service profile

A self service profile defines what input fields your users see and some other general settings like the login caption.

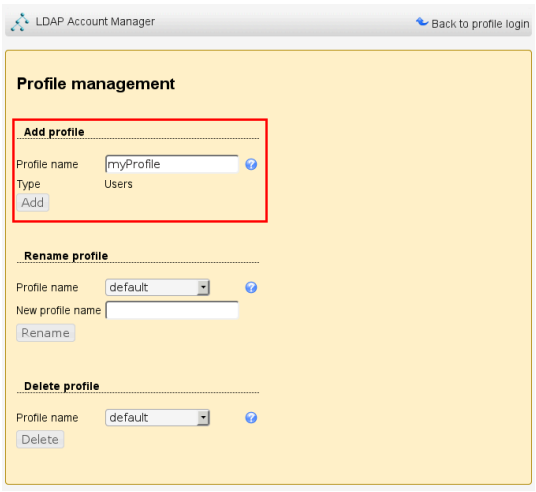
When you go to the LAM configuration page you will see the self service link at the bottom. This will lead you to the self service configuration pages



Now we need to create a new self service profile. Click on the link to manage the self service profiles.



Specify a name for the new profile and enter your master configuration password (default is "lam") to save the profile.



Now go back to the profile login and enter your master configuration password to edit your new profile.

Edit your new profile

General settings

On top of the page you see the link to the user login page. Copy this link address and give it to your users.

Below the link you can specify several options.

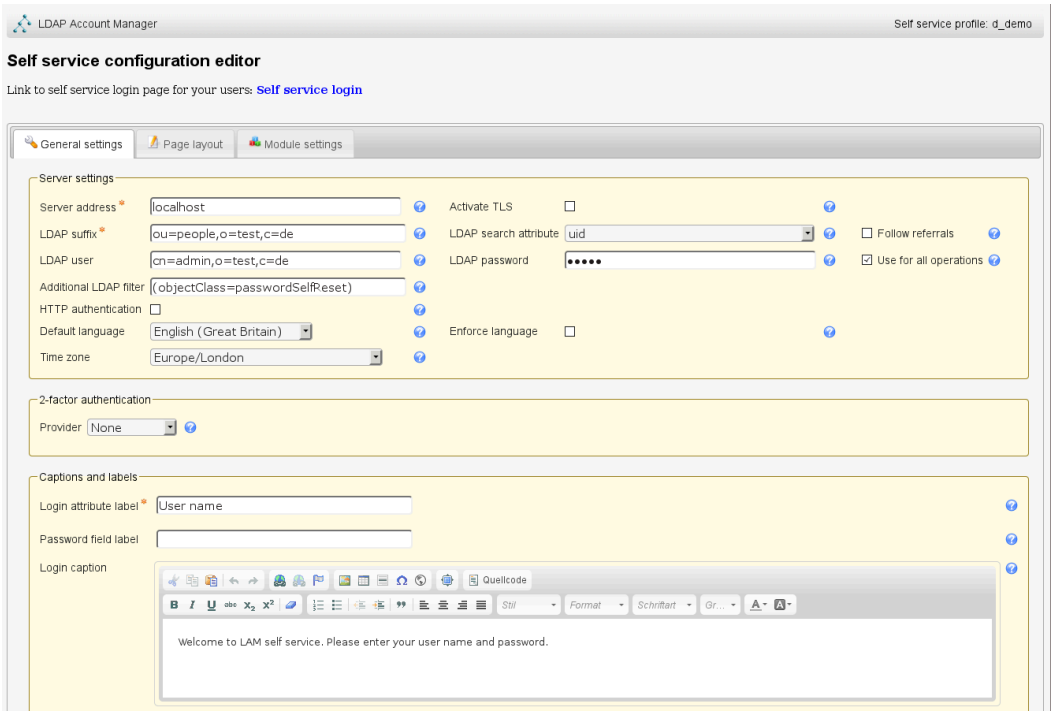


Table 7.1. General options

Server address	The address of your LDAP server. For LDAP+SSL use "ldaps://myserver"
Activate TLS	Activates TLS encryption. Please note that this cannot be combined with LDAP+SSL ("ldaps://").
LDAP suffix	The part of the LDAP tree where LAM should search for users
LDAP search attribute	Here you can specify if your users can login with user name + password, email + password or other attributes.
Follow referrals	By default LAM will not follow LDAP referrals. This is ok for most installations. If you use LDAP referrals please activate the referral option in advanced settings.
LDAP user + password	The DN and password which is used to search for users in the LDAP database. It is sufficient if this DN has only read rights. If you leave these fields empty LAM will try to connect anonymously.
Use for all operations	By default LAM will use the credentials of the user that logged in to self service for read/modify operations. If you select this box then the connection user specified before will be used instead. Please note that this can be a security risk because the user requires write access to all users. You need to make sure that your LAM server is well protected.
Additional LDAP filter	Use this to enter an additional LDAP filter (e.g. "(objectClass=passwordSelfReset)") to reduce the number of accounts who may use self service.
HTTP authentication	You can enable HTTP authentication for your users. This way the web server is responsible to authenticate your users. LAM will use the given user name + password for the LDAP login. To setup HTTP authen-

	tication in Apache please see this link [http://httpd.apache.org/docs/2.2/howto/auth.html].
Login attribute label	This is the description for the LDAP search attribute. Set it to something which your users are familiar with.
Password field label	This text is placed as label for the password field on the login page. LAM will use "Password" if you do not enter any text.
Login caption	This text is displayed at the login page. You can input HTML, too.
Main page caption	This text is displayed at self service main page where your users change their data. You can input HTML, too.
Page header	This HTML code will be placed on top of all self service pages. E.g. you can use this to place your custom logo. Any HTML code is permitted.
Additional CSS links	Here you can specify additional CSS links to change the layout of the self service pages. This is useful to adapt them to your corporate design. Please enter one link per line.

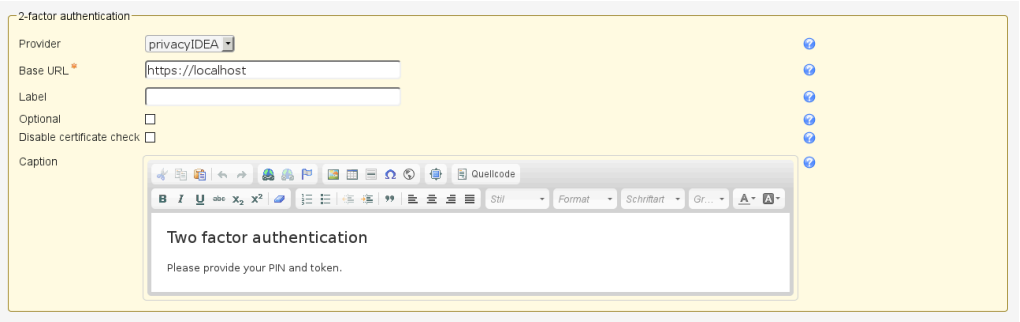
2-factor authentication

LAM supports 2-factor authentication for your users. This means the user will not only authenticate by user+password but also with e.g. a token generated by a mobile device. This adds more security because the token is generated on a physically separated device (typically mobile phone).

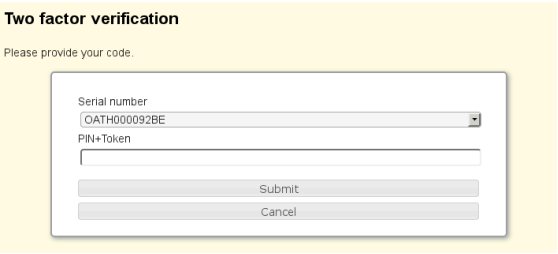
The token is validated by a second application. LAM currently supports:

- privacyIdea [https://www.privacyidea.org/]

By default LAM will enforce to use a token and reject users that did not setup one. You can set this check to optional. But if a user has setup a token then this will always be required.



After logging in with user + password LAM will ask for the 2nd factor. If the user has setup multiple factors then he can choose one of them.



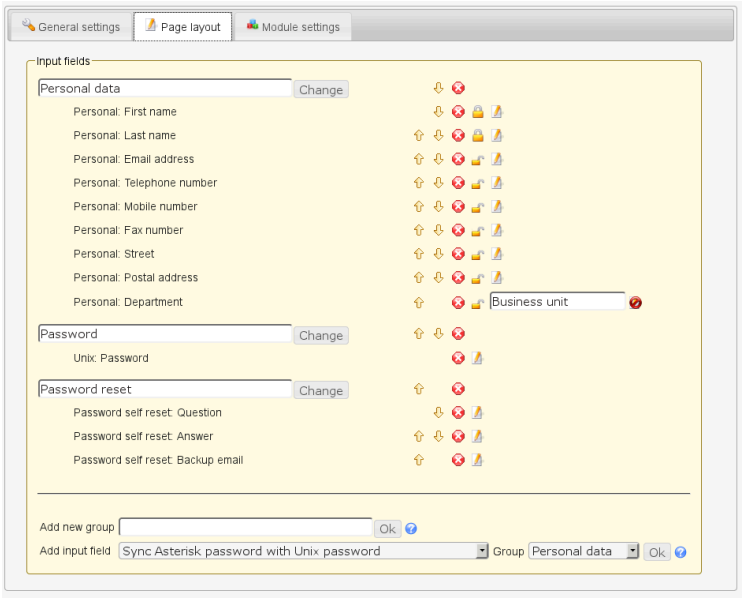
Page layout

Here you can specify what input fields your users can see. It is also possible to group several input fields.

Please use the arrow signs to change the order of the fields/groups.

You may also set some fields as read-only for your users. This can be done by clicking on the lock symbol. Read-only fields can be used to show your users additional data on the self service page that must not be changed by themselves (e.g. first/last name).

Sometimes, you may want to set a custom label for an input field. Click on the edit icon to set your own label text (Personal: Department is relabeled as "Business unit" here).



Possible input fields

This is a list of input fields you may add to the self service page.

Table 7.2. Self service fields

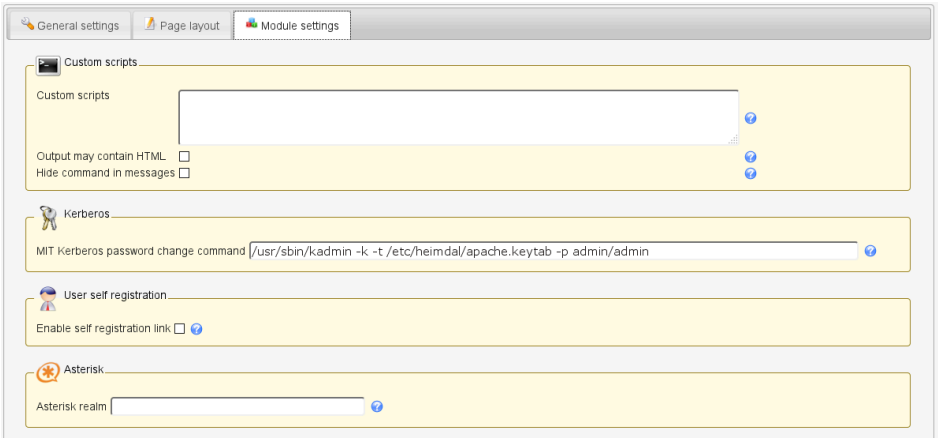
Account type	Option	Description
Asterisk (voicemail)	Sync Asterisk password with Unix password	This is a hidden field. It will update the Asterisk password each time the Unix password is changed.
Kerberos	Sync Kerberos password with Unix password	This is a hidden field. It will update the Kerberos password each time the Unix password is changed.
Kolab	Delegates	Allows to manage delegate permissions
	Invitation policy	Invitation policy management
Password policy	Last password change	read-only
Password self reset	Question	Security question selection
	Answer	Security answer
	Backup email	(External) backup email address that has no relation to user password.
Personal	Business category	
	Car license	

	Department	
	Description	
	Email address	
	Fax number	
	First name	
	Home telephone number	
	Initials	
	Job title	
	Last name	
	Location	
	Mobile number	
	Office name	
	Organisation	
	Organisational unit	
	Photo	Shows the user photo if set. The user may also remove the photo or upload a new one.
	Postal address	
	Postal code	
	Post office box	
	Registered address	
	Room number	
	State	
	Street	
	Telephone number	
	User certificates	Upload of user certificates in PEM or DER format
	User name	
	Web site	
 Samba 3	Password	Input field to set a new NT/LM password. The attribute "sambaPwdLastSet" is updated if it existed before.
	Sync Samba LM password with Unix password	This is a hidden field. It will update the Samba LM password each time the Unix password is changed.
	Sync Samba NT password with Unix password	This is a hidden field. It will update the Samba NT password each time the Unix password is changed.
	Update attribute "sambaPwdLastSet" on password change	Updates the password timestamp when password is synchronized with Unix.
	Last password change (read-only)	Displays the date and time of the user's last password change.
 Shadow	Last password change (read-only)	Displays the date and time of the user's last password change (Unix).

Windows	Password	Change the user's password
	Location	
	Office name	
	Postal code	
	Post office box	
	State	
	Street	
	Telephone number	
	Web site	
Unix	Common name	
	Login shell	
	Password	This is also the source for several password synchronization options.
	Sync Unix password with Windows password	This is a hidden field. It will update the Unix password each time the Windows password is changed.
Kopano	"Send as" privileges	Define user who may send mails as this user
	Email aliases	Email aliases
Zarafa	"Send as" privileges	Define user who may send mails as this user
	Email aliases	Email aliases
PyKota	Balance (read-only)	Current balance for printing
	Total paid (read-only)	Total money paid
	Payment history	History of user payments
	Job history	History of printed jobs

Module settings

This allows to configure some module specific options (e.g. custom scripts or password hash type).

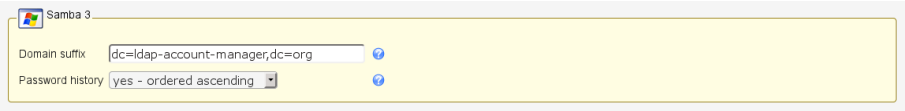


Samba 3

LAM Pro can check the password history and minimum age for Samba 3 password changes. In this case please provide the LDAP suffix where your Samba 3 domain(s) are stored.

If you leave the field empty then no history and age checks will be done.

Password history: depending on your LDAP server you might need ascending or descending order. Just switch the setting if the password history is not correctly updated.



Password self reset

Schema installation

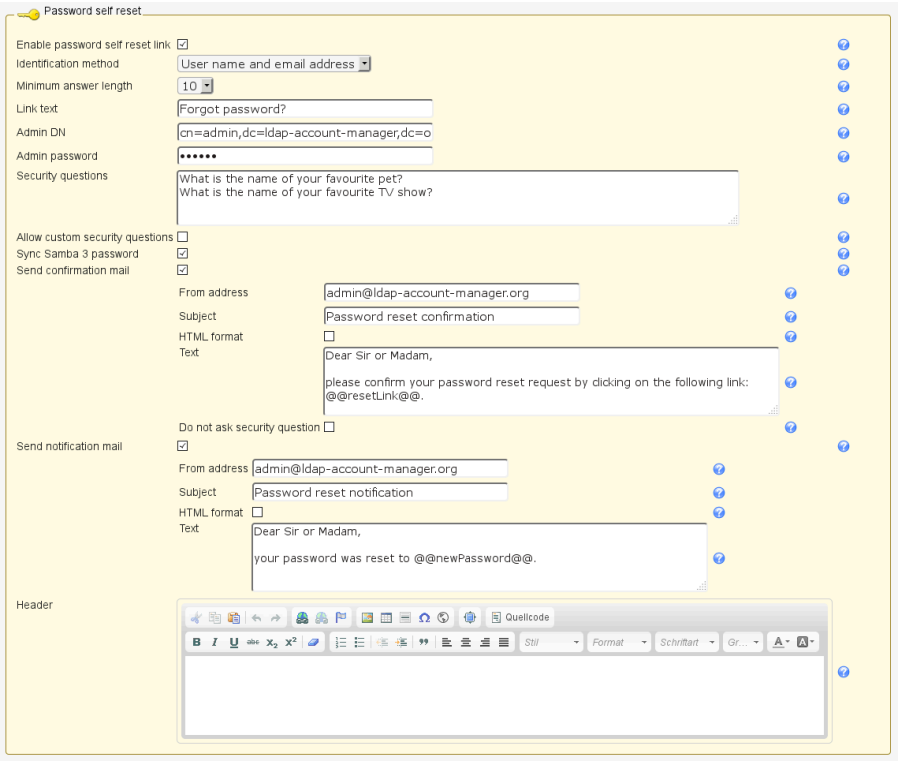
Please install the LDAP schema as described here.

Settings

You can allow your users to reset their passwords themselves. This will reduce your administrative costs for cases where users forget their passwords.

To enable this feature please activate the checkbox "Enable password self reset link".

Hint: Plese note that LAM Pro uses security questions by default. Activate confirmation mails and then deactivate security questions if you want to use only email validation.



You can now configure the minimum answer length for password reset answers. This is checked when you allow you users to specify their answers via the self service. Additionally, you can specify the text of the password reset link (default: "Forgot password?"). The link is displayed below the password field on the self service login page.

Next, please enter the DN and password of an LDAP entry that is allowed to reset the passwords. This entry needs write access to the attributes shadowLastChange, pwdAccountLockedTime and userPassword. It also needs read access to uid, mail, passwordSelfResetQuestion and passwordSelfResetAnswer. Please note that LAM Pro saves the password on your server file system. Therefore, it is required to protect your server against unauthorised access.

Please also specify the list of password reset questions that the user can choose.

Please note that self service and LAM admin interface are separated functionalities. You need to specify the list of possible security questions in both self service profile(s) and server profile(s).

You can inform your users via mail about their password change. The mail can include the new password by using the special wildcard "@@newPassword@@". Additionally, you may want to insert other wildcards that are replaced by the corresponding LDAP attributes. E.g. "@@uid@@" will be replaced by the user name. Please see email format option in case of broken mails. See here for setting up your SMTP server.

LAM Pro can send your users an email with a confirmation link to validate their email address. Of course, this should only be used if the email account is independent from the user password (e.g. at external provider) or you use the backup email address feature. The mail body must include the confirmation link by using the special wildcard "@@resetLink@@". Additionally, you may want to insert other wildcards that are replaced by the corresponding LDAP attributes. E.g. "@@uid@@" will be replaced by the user name.

There is also an option to skip the security question at all if email verification is enabled. In this case the password can be reset directly after clicking on the confirmation link. Please handle with care since anybody with access to the user's mail account can reset the password.

Troubleshooting:

1. You get messages like "Unable to find user account."

This can have multiple reasons:

- security questions enabled but no security question and/or answer set for this user
- user name + email combination does not exist
- no connection to LDAP server

Turn on logging in LAM's main configuration settings. The exact reason is logged on notice level.

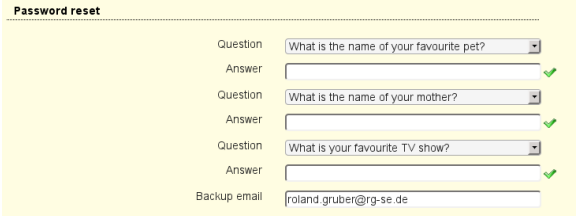
2. You do not see security question and answer fields when logged into self service.

Probably, the user does not have the object class "passwordSelfReset" set. You can do this in admin interface. If you have multiple users to change then use the Multi Edit Tool to add the object class.

New fields for self service page

There are special fields that you may put on the self service page for your users. These fields allow them to change the reset questions and its answers. It is also possible to set a backup email address to reset passwords with an external email address.

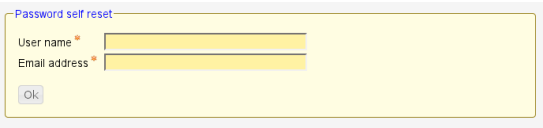
This is an example how can be presented to your users on the self service page:



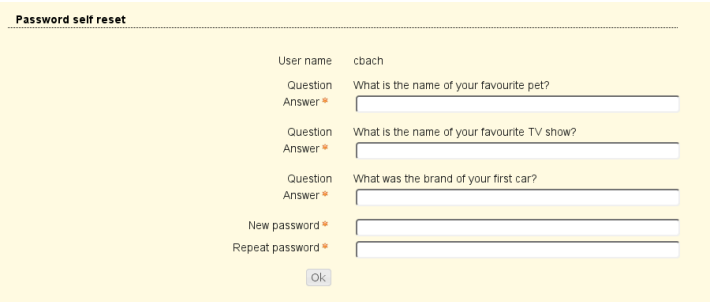
Password reset link

After activating the password self reset feature there will be a new link on the self service login page. The text can be configured as described above (default: "Forgot password?").

When a user clicks on the link then he will be asked for identification with his user name and email address.



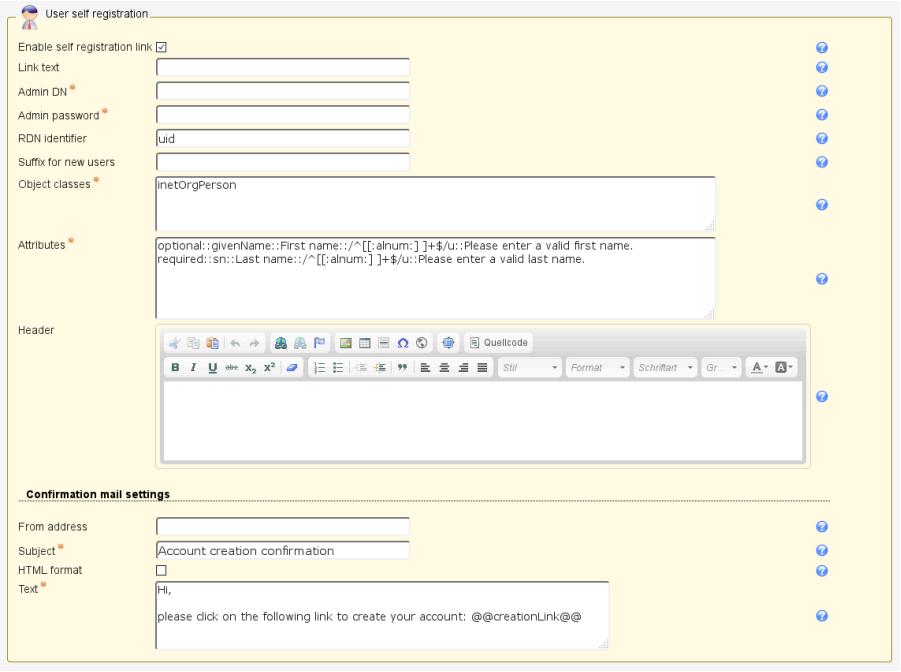
LAM Pro will use this information to find the correct LDAP entry of this user. It then displays the user's security questions and input fields for his new password. If the answer is correct then the new password will be set. Additionally, pwdAccountLockedTime will be removed and shadowLastChange updated to the current time if existing.



User self registration

With LAM Pro your users can create their own accounts if you like. LAM Pro will display an additional link on the self service login page that allows you users to create a new account including email validation (see here for setting up your SMTP server).

You enable this feature in your self service profile. Just activate the checkbox "Enable self registration link".



Options:

Link text: This is the label for the link to the self registration. If empty "Register new account" will be used.

Admin DN and password: Please enter the LDAP DN and its password that should be used to create new users. This DN also needs to be able to do LDAP searches by uid in the self service part of your LDAP tree.

Object classes: This is a list of object classes that are used to build the new user accounts. Please enter one object class in each line. If you use LAM Pro password self reset feature then do not forget to add "passwordSelfReset" here.

Attributes: This is a list of additional attributes that the user can enter. Please note that user name, password and email address are mandatory anyway and need not be specified.

Each line represents one LDAP attribute. The settings are separated by "::". The first setting specifies the field type. The second setting is the LDAP attribute name. Depending on the field type you can enter additional options:

Table 7.3.

Description	Type	Attribute name	First option	Second option	Third option
An optional input field that is displayed on the registration page.	optional	e.g. "givenName"	Label that is displayed on page	optional regular expression for validation (e.g. "/^[0-9a-zA-Z]+$/")	validation message if value does not match validation expression
A required input field that is displayed on the registration page. Self registration cannot be done if such a field is left empty by the user.	required	e.g. "sn"	Label that is displayed on page	optional regular expression for validation (e.g. "/^[0-9a-zA-Z]+$/")	validation message if value does not match validation expression
Constant attribute value, not visible for the user. Can be used to set some initial values or data that must not be edited by the user.	constant	e.g. "homeDirectory"	attribute value, supports wirldcards to insert other attribute values (e.g. "@@uid@@")		
Auto-numbering for attributes such as uidNumber. Will do a search for attribute values in the given range and use highest value + 1.	autorange	e.g. uidNumber	LDAP search base, e.g. ou=people,dc=company,dc=com	Minimum value, e.g. 1000	Maximum value, e.g. 2000

For a syntax description of validation expressions see here [http://perldoc.perl.org/perlre.html]. Validation is optional, you can leave these options blank.

Example:

optional::givenName::First name::/^[[:alnum:]]+$/u::Please enter a valid first name.

required::sn::Last name::/^[[:alnum:]]+$/u::Please enter a valid last name.

constant::homeDirectory::/home/@@uid@@

autorange::uidNumber::ou=people,dc=company,dc=com::10000::20000

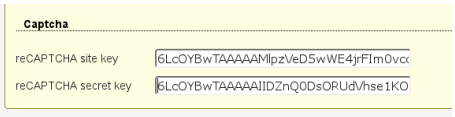
If you use the object class "inetOrgPerson" and do not provide the "cn" attribute then LAM will set it to the user name value.

Please note that only simple input boxes are supported for account registration. The user may log in to self service when his account was created to manage all his attributes.

Captcha support

LAM Pro can optionally display a captcha to verify that registrations are not from robots. The supported captcha provider is Google reCAPTCHA. You will need the site and secret key for your domain. They can be retrieved from here: https://www.google.com/recaptcha

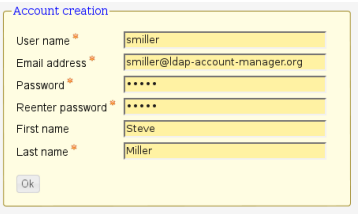
Please note that your web server must be able to access "https://www.google.com/recaptcha/api/siteverify" to verify the captchas. Captchas will be displayed automatically when site+secret key are filled.



User view:

The user can register by clicking on a link on the self service login page:

Here he can insert the data that you specified in the self service profile:



LAM will then send him an email with a validation link that is valid for 24 hours. When he clicks on this link then the account will be created in the self service user suffix. The DN will look like this: *uid=<user name>,...*

Please see email format option in case of broken mails.

Custom fields

This module allows you to manage LDAP attributes that are not covered by the other LAM modules (e.g. if you use custom LDAP schemas). You can fully define how your input fields look like:

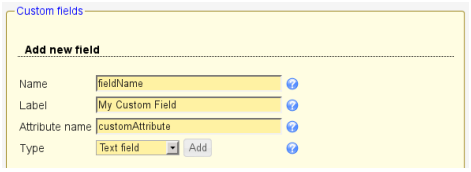
- Label

- LDAP attribute name
- Unique name for field
- Help text
- Read-only display
- Field type: text, password, text area, checkbox, radio buttons, select list, file upload
- Validation via regular expression
- Error message if validation fails

To create custom fields for the Self Service please edit your Self Service profile and switch to tab "Module settings". Here you can add a new field. Simply fill the fields and press on "Add".

Please note that the field name cannot be changed later. It is the unique ID for this field.

After you created your fields please press on "Sync fields with page layout". Now you can switch to tab "Page layout" and add your new fields like any other standard field.



Examples for fields and their representation in Self Service:

Text field:

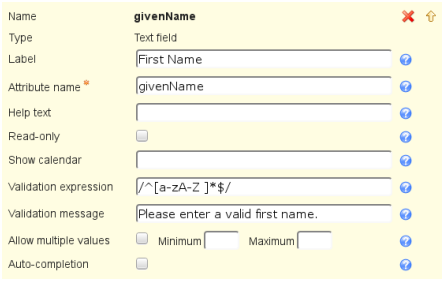
Text fields allow to specify a validation expression and error message.

You can also enable auto-completion. In this case LAM will search all accounts for the given attribute and provide auto-completion hints when the user edits this field. This should only be used if there is a limited number of different values for this attribute.

In case your field is a date value you can show a calendar for easy editing.

Example calendar formats:

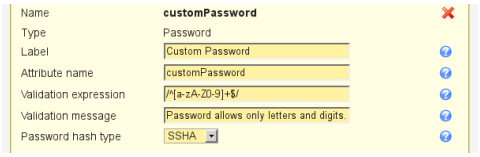
- dd.mm.yy: 31.12.2016
- yy-mm-dd: 2016-12-31
- d M, y: 31 Dec, 16
- d MM, y: 31 December, 2016



Presentation in Self Service:

Password field:

You can also manage custom password fields. LAM Pro will display two fields where the user must enter the same password. You can hash the password if needed.

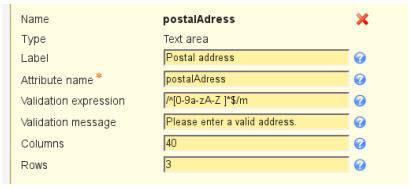


Presentation in Self Service:

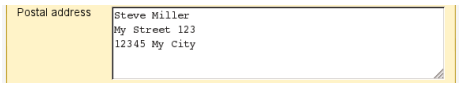
Text area:

This adds a multi-line field. The options are similar to text fields. Additionally, you can set the size with the number of columns and rows.

Please note that the validation expression should be set to multi-line. This is done by adding "m" at the end.

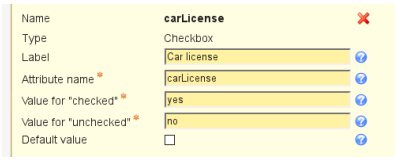


Presentation in Self Service:

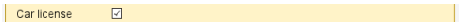


Checkbox:

Sometimes you may want to allow only yes/no values for your LDAP attributes. This can be represented by a checkbox. You can specify the values for checked and unchecked. The default value is set if the LDAP attribute has no value.



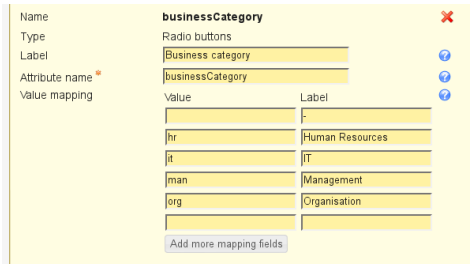
Presentation in Self Service:



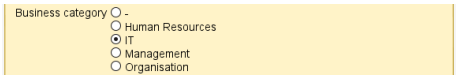
Radio buttons:

This displays a list of radio buttons where the user can select one value.

You can specify a mapping of LDAP attribute values and their display (label) on the Self Service page. To add more mapping fields please press "Add more mapping fields".



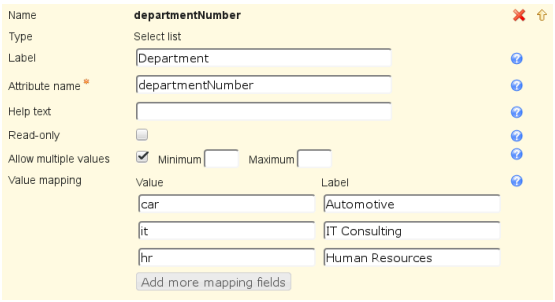
Presentation in Self Service:



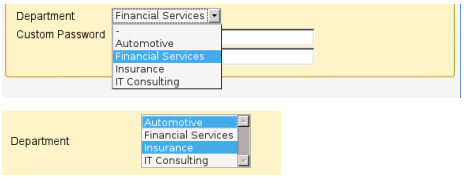
Select list:

Select lists allow the user to select a value in a large list of options. The definition of the possible values and their display is similar to radio buttons.

You can also allow multiple values.

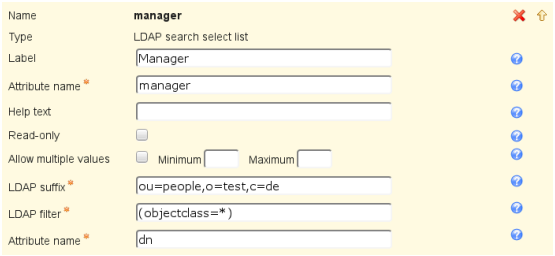


Presentation in Self Service:



LDAP search select list

This is similar to "Select list" but the option are read from LDAP. You can use this to define e.g. a DN selection list. Multiple values are supported.

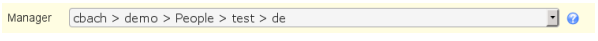


LDAP suffix: The LDAP DN that is used as starting point to search for LDAP entries.

LDAP filter: Only LDAP entries that match this filter will be used. If all entries should be used then use "(objectclass=*)".

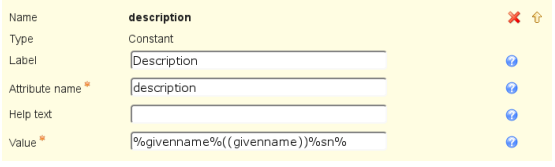
Attribute name: The values of this attribute will be used to build the selection list.

Presentation:



Constant value

This will set the attribute to a constant value. You can also specify wildcards to inject other attribute's values.



Wildcards:

- %attribute%: attribute value
- @attribute@: first character of attribute
- ?attribute?: first character of attribute in lower case
- !attribute!: first character of attribute in upper case
- ??attribute??: attribute in lower case
- !!attribute!!: attribute in upper case
- ((attribute)): space if attribute is set
- §attribute|;§; attribute values separted by ";" (you can set other separators if you want)

Examples for attributes gn="Steve", sn="Miller" and memberUid=("user1", "user2") (specified value -> resulting LDAP value):

Table 7.4.

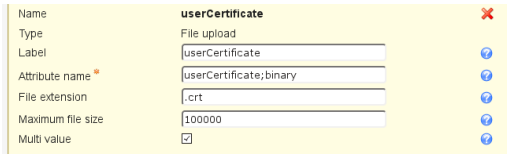
Constant value	Resulting LDAP value
my constant	my constant
%gn%	Steve
%gn%((gn))%sn%	Steve Miller (would be "Miller" if gn is empty)
§memberUid|, §	user1, user2

Presentation:

The LDAP value will be shown as text.

File upload:

This is used for binary data. You can restrict uploaded data to a given file extension and set the maximum file size.



Presentation:

The uploaded data may also be downloaded via LAM.

Validation expressions:

The validation expressions follow the standard of Perl regular expressions [http://perldoc.perl.org/perlre.html]. They start and end with a "/". The beginning of a line is specified by "^" and the end by "$".

Examples:

/^[a-z0-9]+$/ allows small letters and numbers. The value must not be empty ("+").

/^[a-z0-9]+$/i allows small and capital letters ("i" at the end means ignore case) and numbers. The value must not be empty ("+").

Special characters that must be escaped with "\": "\", ".", "(", ")"

E.g. /^[a-z0-9\.]$/i

Adapt the self service to your corporate design

LAM Pro allows you to integrate customs CSS style definitions and design the header of all self service pages. This way you can integrate you own logo and use your company's colors.

Custom header

The default LAM Pro header includes a logo and a horizontal line. You can enter any HTML code here. It will be included in the self services pages after the body tag.

CSS files

Usually, companies have regulations about their corporate design and use common CSS files. This assures a common appearance of all intranet pages (e.g. colors and fonts). To include additional CSS files just use the following setting for this task. The additional CSS links will be added after LAM Pro's default CSS link. This way you can overwrite LAM Pro's style.

Appendix A. LDAP schema files

Here is a list of needed LDAP schema files for the different LAM modules. For OpenLDAP we also provide a source where you can get the files.

Table A.1. LDAP schema files

	Account type	Object class(es)	Schema name	Source	Notes
	Unix accounts	posixAccount, shadowAccount, hostObject, posixGroup	nis.schema, rfc2307bis.schema, ldapns.schema (hostObject)	Part of OpenLDAP installation, part of libpam-ldap (ldapns.schema)	The rfc2307bis.schema is only supported by LAM Pro. Use the nis.schema if you do not want to upgrade to LAM Pro.
	Address book entries	inetOrgPerson	inetorgperson.schema	Part of OpenLDAP installation	
	Samba 3 accounts	sambaSamAccount, sambaGroupMapping, sambaDomain	samba.schema	Part of Samba tarball (examples/LDAP/samba.schema)	
	Windows AD (Samba 4)	user, group, computer		Samba 4 built-in	
	Kolab 2/3 users	kolabUser	kolab2/3.schema, rfc2739.schema	Part of Kolab 2/3 installation	
	Asterisk (extension)	AsteriskSIPUser, AsteriskExtension	asterisk.schema	Part of Asterisk installation	
	PyKota users, groups, printers and billing codes	pykotaObject, pykotaAccount, pykotaAccountBalance, pykotaGroup, pykotaPrinter, pykotaBilling	pykota.schema	Part of PyKota installation	
	Mail routing	inetLocalMailRecipient	misc.schema	Part of OpenLDAP installation	
	Hosts	hostObject, device	ldapns.schema	Part of libpam-ldap installation	The device object class is only available in LAM Pro.
	Authorized services	authorizedServiceObject	ldapns.schema	Part of libpam-ldap installation	
	Mail aliases	nisMailAlias	misc.schema	Part of OpenLDAP installation	
	Qmail user	qmailUser	qmail.schema	Part of qmail_ldap [http://www.n-rg4u.com/]	LAM Pro only

	Account type	Object class(es)	Schema name	Source	Notes
	MAC addresses	ieee802device	nis.schema	Part of OpenLDAP installation	
	IP addresses	ipHost	nis.schema	Part of OpenLDAP installation	LAM Pro only
	Puppet	puppetClient	puppet.schema	Puppet on GitHub [https://github.com/puppetlabs/puppet/blob/master/ext/ldap/puppet.schema]	
	EDU person	eduPerson	eduperson.schema	http://middleware.internet2.edu [http://middleware.internet2.edu/eduperson/]	
	Simple Accounts	account	cosine.schema	Part of OpenLDAP installation	
	SSH public keys	ldapPublicKey	openssh-lpk.schema	Included in patch from http://code.google.com/p/openssh-lpk/	
	Filesystem quotas	systemQuotas	quota.schema	Linux DiskQuota [http://sourceforge.net/projects/linuxquota/]	
	Group of (unique) names	groupOfNames, groupOfUniqueNames, groupOfMembers	core.schema	Part of OpenLDAP installation	LAM Pro only
	Groups	organizationalRole	core.schema	Part of OpenLDAP installation	LAM Pro only
	DHCP	dhcpOptions, dhcpSubnet, dhcpServer	dhcp.schema	docs/schema/dhcp.schema	The LDAP suffix should be set to your dhcpServer entry.
	Bind DLZ DNS	dlzZone, dlzHost, dlzSOARecord, dlzNSRecord, dlzARecord, dlzMXRecord, dlzCNameRecord, dlzPTRRecord	dlz.schema	part of Bind DLZ patch [http://bind-dlz.sourceforge.net/]	LAM Pro only
	Aliases	alias, uidObject	core.schema	Part of OpenLDAP installation	LAM Pro only
	NIS netgroups	nisNetgroup	nis.schema	Part of OpenLDAP installation	

	Account type	Object class(es)	Schema name	Source	Notes
	NIS objects	nisObject	nis.schema	Part of OpenLDAP installation	LAM Pro only
	Automount objects	automount	autofs.schema, rfc2307bis.schema	Autofs LDAP	LAM Pro only
	Oracle databases	orclNetService	oidbase.schema, oidnet.schema, oidrdbms.schema, alias.schema	Preinstalled on Oracle directory server, OpenLDAP schemas can be downloaded e.g. here [http://www.idevelopment.info/data/Oracle/DBA_tips/LDAP/LDAP_8.shtml]	LAM Pro only
	Password policies	pwdPolicy, device	ppolicy.schema, core.schema	Part of OpenLDAP installation	LAM Pro only
	FreeRadius users	radiusprofile	openldap.schema	Part of FreeRadius installation	
	Heimdal Kerberos	krb5KDCEntry	hdb.schema	Part of Heimdal Kerberos installation	LAM Pro only
	MIT Kerberos	krbPrincipal, krbPrincipalAux, krbTicketPolicyAux	kerberos.schema	Part of MIT Kerberos installation	LAM Pro only
	Sudo roles	sudoRole	sudo.schema	Part of sudo-ldap installation	LAM Pro only
	Kopano	kopano-user, kopano-contact, kopano-group, kopano-dynamicgroup, kopano-addresslist, kopano-server	kopano.ldif	Part of Kopano installation	LAM Pro only
	Zarafa	zarafa-user, zarafa-group, zarafa-server	zarafa.schema	Part of Zarafa installation	LAM Pro only
	IMAP mailboxes	-	-	-	Does not require any schema.
	LDAP views	nsview, organizationalunit	built-in	Part of LDAP server installation (e.g. 389 server)	LAM Pro only

Appendix B. Security

LAM configuration passwords

LAM supports a two level authorization system for its configuration. Therefore, there are two types of configuration passwords:

- **master configuration password:** needed to change general settings, create/delete server profiles and self service profiles
- **server profile password:** used to change the settings of a server profile (e.g. LDAP server and account types to manage)

The master configuration password can be used to reset a server profile password. Each server profile has its own profile password.

Both password types are stored as hash values in the configuration files for enhanced security.

Use of SSL

The data which is transfered between you and LAM is very sensitive. Please always use SSL encrypted connections between LAM and your browser to protect yourself against network sniffers.

LDAP with SSL and TLS

SSL will be used if you use ldaps://servername in your configuration profile. TLS can be activated with the "Activate TLS" option.

If your LDAP server uses a SSL certificate of a well-know certificate authority (CA) then you probably need no changes. If you use a custom CA in your company then there are two ways to setup the CA certificates.

Setup SSL certificates in LAM general settings

This is much easier than system level setup and will only affect LAM. There might be some cases where other web applications on the same web server are influenced.

See here for details.

Setup SSL certificates on system level

This will make the CA certificates available also to other applications on your system (e.g. other web applications).

You will need to setup ldap.conf to trust your server certificate. Some installations use /etc/ldap.conf and some use /etc/ldap/ldap.conf. It is a good idea to symlink /etc/ldap.conf to /etc/ldap/ldap.conf. Specify the server CA certificate with the following option:

```
TLS_CACERT /etc/ldap/ca/myCA/cacert.pem
```

This needs to be the public part of the signing certificate authority. See "man ldap.conf" for additional options.

You may also need to specify the CA certificate in your Apache configuration by using the option "LDAPTrustedGlobalCert":

```
LDAPTrustedGlobalCert CA_BASE64 /etc/ldap/ca/myCA/cacert.pem
```

Selinux

In case your server has selinux installed you might need to extend the selinux ruleset. E.g. your webserver might not be allowed to write in /var/lib.

Read selinux status

The following command will tell you if selinux is running in Enforcing or Permissive mode.

Enforcing: access that does not match rules is denied

Permissive: access that does not match rules is granted but logged to audit.log

```
getenforce
```

Set selinux to Permissive mode

This will just log any access violations. You will need this to get a list of missing rights.

```
setenforce Permissive
```

Now do any actions inside LAM that you need for your daily work (e.g. edit server profiles, manage LDAP entries, ...).

Extend selinux rules

Selinux now has logged any violations to audit.log. You can use this now to extend your ruleset and enable enforcing later.

The following example is for httpd. You can also adapt it to e.g. nginx.

```
# build additional selinux rules from audit.log
grep httpd /var/log/audit/audit.log | audit2allow -m httpdlocal -o httpdlocal.te
```

The httpdlocal.te might look like this:

```
module httpdlocal 1.0;

require {
        type httpd_t;
        type var_lib_t;
        class file { setattr write };
}

#============= httpd_t ==============

#!!!! WARNING 'httpd_t' is not allowed to write or create to var_lib_t.  Change the labe
#!!!! $ semanage fcontext -a -t httpd_var_lib_t /var/lib/ldap-account-manager/config/lam
#!!!! $ restorecon -R -v /var/lib/ldap-account-manager/config/lam.conf
allow httpd_t var_lib_t:file { setattr write };
```

Now we can compile and install this rule:

```
# build module
checkmodule -M -m -o httpdlocal.mod httpdlocal.te
# package module
```

```
semodule_package -o httpdlocal.pp -m httpdlocal.mod
# install module
semodule -i httpdlocal.pp
```

Now you can switch back to Enforcing mode:

```
setenforce Enforcing
```

LAM should now work as expected with active selinux.

Chrooted servers

If your server is chrooted and you have no access to /dev/random or /dev/urandom this can be a security risk. LAM stores your LDAP password encrypted in the session. LAM uses rand() to generate the key if /dev/random and /dev/urandom are not accessible. Therefore the key can be easily guessed. An attaker needs read access to the session file (e.g. by another Apache instance) to exploit this.

Protection of your LDAP password and directory contents

You have to install the OpenSSL extension for PHP to enable encryption.

Your LDAP password is stored encrypted in the session file. The key and IV to decrypt it are stored in two cookies. We use OpenSSL/AES to encrypt the password. All data that was read from LDAP and needs to be stored in the session file is also encrypted.

Apache configuration

Sensitive directories

LAM includes several .htaccess files to protect your configuration files and temporary data. Apache is often configured to not use .htaccess files by default. Therefore, please check your Apache configuration and change the override setting to:

AllowOverride All

If you are experienced in configuring Apache then you can also copy the security settings from the .htaccess files to your main Apache configuration.

If possible, you should not rely on .htaccess files but also move the config and sess directory to a place outside of your WWW root. You can put a symbolic link in the LAM directory so that LAM finds the configuration/session files.

Security sensitive directories:

config: Contains your LAM configuration and account profiles

- LAM configuration passwords (SSHA hashed)
- default values for new accounts
- directory must be accessibly by Apache but needs not to be accessible by the browser

sess: PHP session files

- LAM admin password in clear text or OpenSSL encrypted
- cached LDAP entries in clear text or OpenSSL encrypted
- directory must be accessibly by Apache but needs not to be accessible by the browser

tmp: temporary files

- PDF documents which may also include passwords
- images of your users
- directory contents must be accessible by browser but directory itself needs not to be browseable

Use LDAP HTTP authentication for LAM

With HTTP authentication Apache will be responsible to ask for the user name and password. Both will then be forwarded to LAM which will use it to access LDAP. This approach gives you more flexibility to restrict the number of users that may access LAM (e.g. by requiring group memberships).

First of all you need to load additional Apache modules. These are "mod_ldap [http://httpd.apache.org/docs/2.2/mod/mod_ldap.html]" and "mod_authnz_ldap [http://httpd.apache.org/docs/2.2/mod/mod_authnz_ldap.html]".

Next you can add a file called "lam_auth_ldap" to /etc/apache/conf.d. This simple example restricts access to all URLs beginning with "lam" to LDAP authentication.

```
<location /lam>
  AuthType Basic
  AuthBasicProvider ldap
  AuthName "LAM"
  AuthLDAPURL "ldap://localhost:389/ou=People,dc=company,dc=com?uid"
  Require valid-user
</location>
```

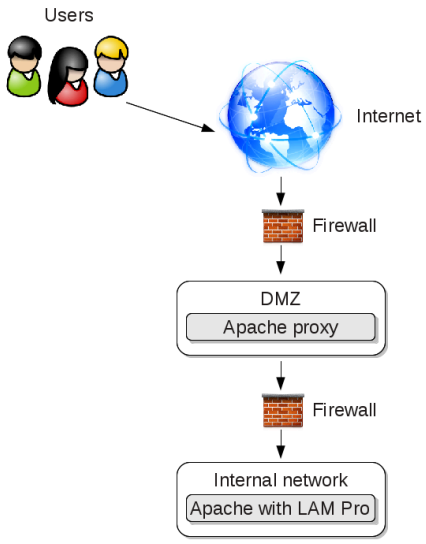
You can also require that your users belong to a certain Unix group in LDAP:

```
<location /lam>
  AuthType Basic
  AuthBasicProvider ldap
  AuthName "LAM"
  AuthLDAPURL "ldap://localhost:389/ou=People,dc=company,dc=com?uid"
  Require valid-user
  # force membership of lam-admins
  AuthLDAPGroupAttribute memberUid
  AuthLDAPGroupAttributeIsDN off
  Require ldap-group cn=lam-admins,ou=group,dc=company,dc=com
</location>
```

Please see the Apache documentation [http://httpd.apache.org/docs/2.2/mod/mod_authnz_ldap.html] for more details.

Self Service behind proxy in DMZ (LAM Pro)

In some cases you might want to make the self service accessible via the internet. Here is an Apache config to forward only the required URLs via a proxy server (lamproxy.company.com) in your DMZ to the internal LAM server (lam.company.com).



This configuration allows your users to open https://lamproxy.company.com which will then proxy the self service on the internal server.

```
<VirtualHost lamproxy.company.com:443>
        ServerName lamproxy.company.com
        ErrorLog /var/log/apache2/lam-proxy-error.log
        CustomLog /var/log/apache2/lam-proxy-access.log combined
        DocumentRoot /var/www/lam-proxy
        <Proxy *>
            Order deny,allow
            Allow from all
        </Proxy>
        SSLProxyEngine on
        SSLEngine on
        SSLCertificateFile /etc/apache2/ssl/apache.pem
        ProxyPreserveHost On
        ProxyRequests off
        loglevel info

        # redirect front page to self service login page
        RewriteEngine on
        RedirectMatch ^/$ /templates/selfService/selfServiceLogin.php?scope=user\&name=

        # proxy required URLs
        ProxyPass /tmp https://lam.company.com/lam/tmp
        ProxyPass /sess https://lam.company.com/lam/sess
        ProxyPass /templates/lib https://lam.company.com/lam/templates/lib
        ProxyPass /templates/selfService https://lam.company.com/lam/templates/selfServi
        ProxyPass /style https://lam.company.com/lam/style
        ProxyPass /graphics https://lam.company.com/lam/graphics

        ProxyPassReverse /tmp https://lam.company.com/lam/tmp
        ProxyPassReverse /sess https://lam.company.com/lam/sess
        ProxyPassReverse /templates/lib https://lam.company.com/lam/templates/lib
        ProxyPassReverse /templates/selfService https://lam.company.com/lam/templates/s
        ProxyPassReverse /style https://lam.company.com/lam/style
        ProxyPassReverse /graphics https://lam.company.com/lam/graphics
</VirtualHost>
```

Nginx configuration

There is no fully automatic setup of Nginx but LAM provides a ready-to-use configuration file.

RPM based installations

The RPM package has dependencies on Apache. Therefore, Nginx is not officially supported with this installation mode. Use tar.bz2 if you are unsure.

However, the package also includes an Nginx configuration file. Please include it in your server directive like this:

```
server {
        ...

        include /etc/ldap-account-manager/lam.nginx.conf;

        ...
}
```

The included config file uses PHP 5. In case you run with PHP 7 please update the parameter "fastcgi_pass" to "/var/run/php7-fpm.sock".

DEB based installations

The LAM installation package ships with an Nginx configuration file. Please include it in your server directive like this:

```
server {
        ...

        include /etc/ldap-account-manager/nginx.conf;

        ...
}
```

The included config file uses PHP 7.0. In case you run with PHP 7.1 or PHP 5 please update the parameter "fastcgi_pass" to "/var/run/php/php7.1-fpm.sock".

tar.bz2 based installations

Please add the following configuration snippet to your server directive.

You will need to change the alias location ("/usr/share/ldap-account-manager") and fastcgi_pass (e.g. "/var/run/php5-fpm.sock" or "/var/run/php7-fpm.sock") to match your installation.

```
location /lam {
  index index.html;
  alias /usr/share/ldap-account-manager;
  autoindex off;

  location ~ \.php$ {
    fastcgi_split_path_info ^(.+\.php)(/.+)$;
    fastcgi_pass unix:/var/run/php5-fpm.sock;
    fastcgi_index index.php;
    fastcgi_param SCRIPT_FILENAME $request_filename;
    include fastcgi_params;
  }
```

```
  location ~ /lam/(tmp/internal|sess|config|lib|help|locale) {
    deny all;
    return 403;
  }

}
```

Appendix C. Typical OpenLDAP settings

Some basic hints to configure the OpenLDAP server:

Size limit:

You will get a message like "LDAP sizelimit exceeded, not all entries are shown." when you hit the LDAP search limit.

OpenLDAP allows by default 500 return values per search, if you have more users/groups/hosts please change this:

slapd.conf:

e.g. "sizelimit 10000" or "sizelimit -1" for unlimited return values

slapd.d:

e.g. "olcSizeLimit: 10000" or "olcSizeLimit: -1" for unlimited return values in /etc/ldap/slapd.d/cn=config.ldif

Unique attributes:

There are cases where you do not want that same attribute values exist multiple times in your database. A good example are UID/GID numbers.

OpenLDAP provides the attribute uniqueness overlay [http://www.openldap.org/doc/admin24/overlays.html] for this task.

Example to force unique UID numbers:

In */etc/ldap/slapd.d/cn=config/cn=module{0}.ldif* add "olcModuleLoad: {3}unique" (replace "3" with the highest existing number plus one).

Now in /etc/ldap/slapd.d/cn=config/olcDatabase={1}bdb.ldif add e.g. "olcUniqueURI: ldap:///?uidNumber?sub"

Indices:

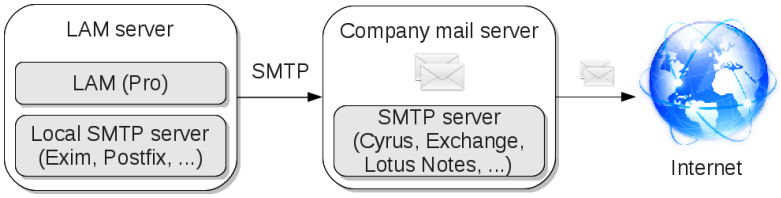
Indices will improve the performance when searching for entries in the LDAP directory. The following indices are recommended:

```
index objectClass eq
index default sub
index uidNumber eq
index gidNumber eq
index memberUid eq
index cn,sn,uid,displayName pres,sub,eq
# Samba 3.x
index sambaSID eq
index sambaPrimaryGroupSID eq
index sambaDomainName eq
```

Appendix D. Setup of email (SMTP) server

LAM always uses a local SMTP email server on the machine where LAM is installed. Therefore, there is no need to configure any SMTP settings inside LAM itself.

The local email server should be configured to forward all emails to your company mail server (so-called smarthost). You can use any SMTP software that ships with a Sendmail wrapper (e.g. Exim, Postfix, QMail or Sendmail itself).



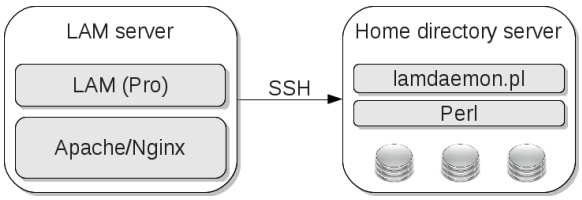
Appendix E. Setup for home directory and quota management

Lamdaemon.pl is used to modify quota and home directories on a remote or local host via SSH (even if homedirs are located on localhost).

If you want wo use it you have to set up the following things to get it to work:

Installation

First of all, you need to install lamdaemon.pl on your remote server where LAM should manage homedirs and/or quota. This is usually a different server than the one where LAM is installed. But there is no problem if it is the same.



Debian based (e.g. also Ubuntu)

Please install the lamdaemon DEB package on your quota/homedir server.

RPM based (Fedora, CentOS, Suse, ...)

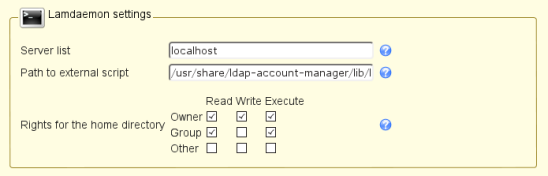
Please install the lamdaemon RPM package on your quota/homedir server.

Other

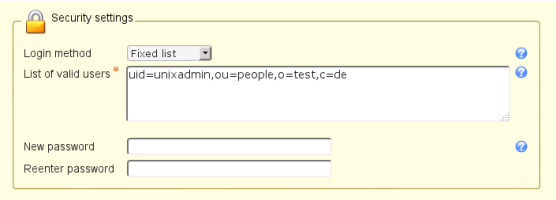
Please copy lib/lamdaemon.pl from the LAM tar.bz2 package to your quota/homedir server. The location may be anywhere (e.g. use /opt/lamdaemon). Please make the lamdaemon.pl script executable.

LDAP Account Manager configuration

- Set the remote or local host in the configuration (e.g. 127.0.0.1)
- Path to lamdaemon.pl, e.g. /srv/www/htdocs/lam/lib/lamdaemon.pl If you installed a Debian or RPM package then the script will be located at /usr/share/ldap-account-manager/lib/lamdaemon.pl.
- Your LAM admin user must be a valid Unix account. It needs to have the object class "posixAccount" and an attribute "uid". This account must be accepted by the SSH daemon of your home directory server. Do not create a second local account but change your system to accept LDAP users. You can use LAM to add the Unix account part to your admin user or create a new account. Please do not forget to setup LDAP write access (ACLs [http://www.openldap.org/doc/admin24/access-control.html]) if you create a new account.



Note that the builtin admin/manager entries do not work for lamdaemon. You need to login with a Unix account.



OpenLDAP ACL location:

The access rights for OpenLDAP are configured in /etc/ldap/slapd.conf or /etc/ldap/slapd.d/cn=config/olcDatabase={1}bdb.ldif.

Setup sudo

The perl script has to run as root. Therefore we need a wrapper, sudo. Edit /etc/sudoers on host where homedirs or quotas should be used and add the following line:

$admin All= NOPASSWD: $path_to_lamdaemon *

$admin is the admin user from LAM (must be a valid Unix account) and *$path_to_lamdaemon* is the path to lamdaemon.pl.

Example:

myAdmin ALL= NOPASSWD: /srv/www/htdocs/lam/lib/lamdaemon.pl *

You might need to run the sudo command once manually to init sudo. The command "sudo -l" will show all possible sudo commands of the current user.

Attention: Please do not use the options "Defaults requiretty" and "Defaults env_reset" in /etc/sudoers. Otherwise you might get errors like "you must have a tty to run sudo" or "no tty present and no askpass program specified".

Setup Perl

We need an extra Perl module - Quota. To install it, run:

perl -MCPAN -e shell
install Quota

If your Perl executable is not located in /usr/bin/perl you will have to edit the path in the first line of lamdaemon.pl. If you have problems compiling the Perl modules try installing a newer release of your GCC compiler and the "make" application.

Several Linux distributions already include a quota package for Perl.

Set up SSH

Your SSH daemon must offer the password authentication method. To activate it just use this configuration option in /etc/ssh/sshd_config:

PasswordAuthentication yes

Troubleshooting

If you have problems managing quotas and home directories then these points might help:

- There is a test page for lamdaemon: Login to LAM and open Tools -> Tests -> Lamdaemon test

- Check /var/log/auth.log or its equivalent on your system. This file contains messages about all logins. If the ssh login failed then you will find a description about the reason here.
- Set sshd in debug mode. In /etc/ssh/sshd_conf add these lines:

  SyslogFacility AUTH
  LogLevel DEBUG3

  Now check /var/log/syslog for messages from sshd.

Error message **"Your LAM admin user (...) must be a valid Unix account to work with lamdaemon!"**: This happens if you use the default LDAP admin/manager user to login to LAM. Please see here and setup a Unix account.

Appendix F. Setup password self reset schema (LAM Pro)

New installation

Please see here if you want to upgrade an existing schema version.

Schema installation

Please install the schema that comes with LAM Pro. The schema files are located in:

- tar.bz2: docs/schema
- DEB: /usr/share/doc/ldap-account-manager/docs/schema
- RPM: /usr/share/doc/ldap-account-manager-{VERSION}/schema

OpenLDAP with slapd.conf configuration

For a configuration with slapd.conf-file copy passwordSelfReset.schema to /etc/ldap/schema/ and add this line to slapd.conf:

```
include         /etc/ldap/schema/passwordSelfReset.schema
```

OpenLDAP with slapd.d configuration

For slapd.d configurations you need to upload the schema file passwordSelfReset.ldif via ldapadd command:

ldapadd -x -W -H ldap://localhost -D "cn=admin,o=test,c=de" -f passwordSelfReset.ldif

Please replace "localhost" with your LDAP server and "cn=admin,o=test,c=de" with your LDAP admin user (usually starts with cn=admin or cn=manager).

389 server

Please replace INSTANCE with installation ID, e.g. slapd-389ds.

```
cp passwordSelfReset-389server.ldif /etc/dirsrv/INSTANCE/schema/70pwdreset.ldif
systemctl restart dirsrv.target
```

Samba 4

The schema files are passwordSelfReset-Samba4-attributes.ldif and passwordSelfReset-Samba4-objectClass.ldif.

First, you need to edit them and replace "DOMAIN_TOP_DN" with your LDAP suffix (e.g. dc=samba4,dc=test).

Then install the attribute and afterwards the object class schema file:

```
ldbmodify -H /var/lib/samba/private/sam.ldb passwordSelfReset-Samba4-attributes.ldif --option="dsdb:schema update allowed"=
ldbmodify -H /var/lib/samba/private/sam.ldb passwordSelfReset-Samba4-objectClass.ldif --option="dsdb:schema update allowed
```

Windows

The schema file is passwordSelfReset-Windows.ldif.

First, you need to edit it and replace "DOMAIN_TOP_DN" with your LDAP suffix (e.g. dc=windows,dc=test).

Then install the schema file as administrator on a command line:

```
ldifde -v -i -f passwordSelfReset-Windows.ldif
```

This allows to set a security question + answer for each account.

Schema update

The schema files are located in:

- tar.bz2: docs/schema/updates
- DEB: /usr/share/doc/ldap-account-manager/docs/schema/updates
- RPM: /usr/share/doc/ldap-account-manager-{VERSION}/schema/updates

Schema versions:

1. Initial version (LAM Pro 3.6 - 4.4)
2. Added passwordSelfResetBackupMail (LAM Pro 4.5 - 5.5)
3. Multiple security questions (LAM Pro 5.6)

OpenLDAP with slapd.conf configuration

Install the schema file like a new install (skip modification of slapd.conf file).

OpenLDAP with slapd.d configuration

The upgrade requires to stop the LDAP server.

Steps:

1. Stop OpenLDAP with e.g. "/etc/init.d/slapd stop"
2. Delete the old schema file. It is located in e.g. "/etc/ldap/slapd.d/cn=config/cn=schema" and called "cn={XX}passwordselfreset.ldif" (XX can be any number)
3. Start OpenLDAP with e.g. "/etc/init.d/slapd start"
4. Install the schema file like a new install

Samba 4

Install the these update files by following the install instructions in the file. In case you you upgrade with a version difference of 2 or more you will need to apply all intermediate update scripts.

- samba4_version_1_to_2_attributes.ldif (upgrade from version 1 only)

- samba4_version_1_to_2_objectClass.ldif (upgrade from version 1 only)
- samba4_version_2_to_3_attributes.ldif (upgrade from version 2)
- samba4_version_2_to_3_objectClass.ldif (upgrade from version 2)

Please note that attributes file needs to be installed first.

Windows

Install the file(s) by following the install instructions in the file. In case you you upgrade with a version difference of 2 or more you will need to apply all intermediate update scripts.

- windows_version_1_to_2.ldif (upgrade from version 1 only)
- windows_version_2_to_3.ldif (upgrade from version 2)

Appendix G. Adapt LAM to your corporate design

There are cases where you might want to change LAM's default look'n'feel to better integrate it in your company network. Changes can be done like this:

Change colors, fonts and other parts with custom CSS

You can integrate custom CSS files in LAM. It is recommended to write a separate CSS file instead of modifying LAM's default files.

The CSS files are located in

DEB/RPM: /usr/share/ldap-account-manager/style
tar.bz2: style

LAM will automatically integrate all CSS files in alphabetical order. E.g. you can create a file called "900_my-Company.css" which will be added as last file.

Example:

This will change the background color of all pages to turquoise. See 500_layout.css for LAM's default settings.

```
body {
  background-color: #b6eeff;
}
```

You can use the same way to change fonts, sizes and more.

E.g. this will reduce the default font size to 80%:

```
body {
  font-size: 80%;
}

.ui-button-text-only {
  font-size: 100%;
}

.ui-button-text-icon-primary {
  font-size: 100%;
}
```

Custom logo

```
/* image in login box */
td.loginLogo {
  background-image: url(/logos/mylogo.png);
}

/* image (24x24) in header line */
a.lamLogo {
  background-image: url(/logos/mylogo.png);
}
```

Other images

All images are located in

DEB/RPM: /usr/share/ldap-account-manager/graphics
tar.bz2: graphics

Please note that if you replace images then you need to reapply your changes every time you upgrade LAM.

Special changes with custom JavaScript

In rare cases it might not be sufficient to write custom CSS or replace some image files. E.g. you might want to add custom content to all pages.

For these cases you can add a custom JavaScript file that contains your code.

The JavaScript files are located in

DEB/RPM: /usr/share/ldap-account-manager/templates/lib
tar.bz2: templates/lib

LAM will automatically integrate all .js files in alphabetical order. E.g. you can create a file called "900_my-Company.js" which will be added as last file.

Self service

See here for self service customisations.

Appendix H. Clustering LAM

LAM is a web application based on PHP. Therefore, clustering is not directly a part of the application.

But here are some hints to run LAM in a clustered environment.

Application parts:

LAM can be divided into three parts

- Software
- Configuration files
- Session files and temporary data

Software:

This is the simplest part. Just install LAM on each cluster node. Please note that if you run LAM Pro you will need either one license for each active cluster node or a company license.

Configuration files:

These files include the LAM server profiles, account profiles, PDF structures, ... Usually, they do not change frequently and can be put on a shared file system (e.g. NFS, AFS, ...).

Please link "config" or "/var/lib/ldap-account-manager/config" to a directory on your shared file system.

Session data and temporary files:

These are critical because the files may change on every page load. There are basically two options:

- load balancer with session stickiness: In this case your load balancer will forward all requests of a user to the same cluster node. In this case you can keep the files locally on your cluster nodes. If you already have a load balancer then this is the simplest solution and performs best. The disadvantage is that if a node fails then all users connected to this node will loose their session and need to relogin.
- shared file system: This should only be used if your load balancer does not support session stickiness or you use a different system to distribute request across the cluster. A shared file system will decrease performance for all page loads.

Session data and temporary files are located in "tmp" + "sess" or "/var/lib/ldap-account-manager/tmp" + "/var/lib/ldap-account-manager/sess".

Appendix I. Troubleshooting

Reset configuration password

The password for the server profiles can be reset using the master configuration password. Open LAM configuration -> Edit server profiles ->Manage server profiles for this.

In case you lost your master configuration password you need to manually edit the main configuration file (config.cfg) on the file system.

1. Locate config.cfg: On DEB/RPM installations it is in /usr/share/ldap-account-manager/config and for tar.bz2 in config folder.

2. Locate the "password" entry in the file

3. Replace the password hash after "password: " with your new clear-text password (e.g. "secret")

After the change the line should look like this:

password: secret

You can now login using your new password. Set the password once again via GUI in main configuration settings. This will then put again a hash value in the config.cfg file.

Functional issues

Size limit

You will get a message like "LDAP sizelimit exceeded, not all entries are shown." when you hit the LDAP search limit.

- OpenLDAP: See the OpenLDAP settings to fix this.
- 389 server: set nsslapd-sizelimit in cn=config (may also be set per user)
- other LDAP servers: please see your server documentation

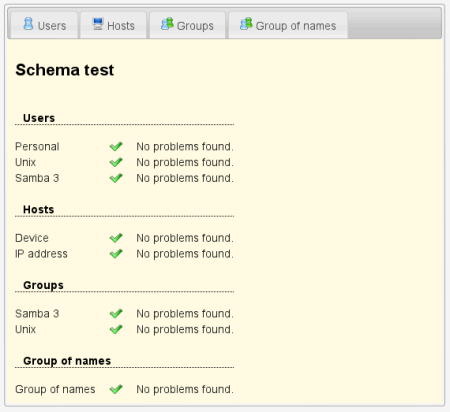
Invalid syntax errors:

If you get any strange errors like "Invalid syntax" or "Invalid DN syntax" please check if your LDAP schema matches LAM's requirements.

Schema test:

This can be done by running "Tools" -> "Tests" -> "Schema test" inside LAM.

If there are any object classes or attributes missing you will get a notice. See LDAP schema files for a list of used schemas. You may also want to deactive unused modules in your LAM server profile (tab "Modules").



LDAP Logging:

If your schema is correct you can turn on LDAP logging to get more detailed error messages from your LDAP server.

OpenLDAP logging:

- slapd.conf: In /etc/ldap/slapd.conf turn logging on with the line "loglevel 256".
- slapd.d: In /etc/ldap/slapd.d/cn=config.ldif please change the attribute "olcLogLevel" to "Stats". Please add a line "olcLogLevel: Stats" if the attribute is missing.

After changing the configuration please restart OpenLDAP. It usually uses /var/log/syslog for log output.

PHP logging

Sometimes it can help to enable PHP logging inside LAM. You can do this in the logging area of LAM's main configuration. Set the logging option to "all" and check if there are any messages printed in your browser window. Please note that not every notice message is an error but it may help to find the problem.

Performance issues

LAM is tested to work with 10000 users with acceptable performance. If you have a larger directory or slow hardware then here are some points to increase performance.

The first step is to check if performance problems are caused by the LAM web server or the LDAP server. Please check which machine suffers from high system load (CPU/memory consumption).

High network latency may also be a problem. For large installations please make sure that LAM web server and LDAP server are located in the same building/server room.

If you run LAM on multiple nodes (DNS load balancing/hardware load balancer) then also check the clustering section.

LDAP server

Use indices

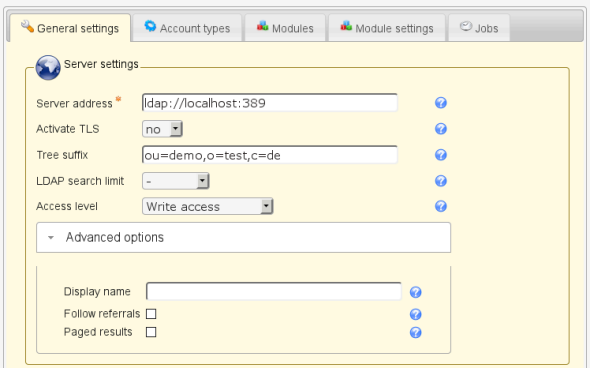
Depending on the queries it may help to add some more indices on the LDAP server. Depending on your LDAP software it may already suggest indices in its log files. See here for typical OpenLDAP indices.

Reduce query results by splitting LDAP management into multiple server profiles

If you manage a very large directory then it might already be separated into multiple subtrees (e.g. by country, subsidiary, ...). Do not use a single LAM server profile to manage your whole directory. Use different server profiles for each separated LDAP subtree where possible (e.g. one for German users and one for French ones).

Limit query results

LAM allows to set an LDAP search limit [general_settings] for each server profile. This will limit the number of entries returned by your LDAP server. Use with caution because it can cause problems (e.g. with automatic UID generation) when LAM is not able to read all entries.



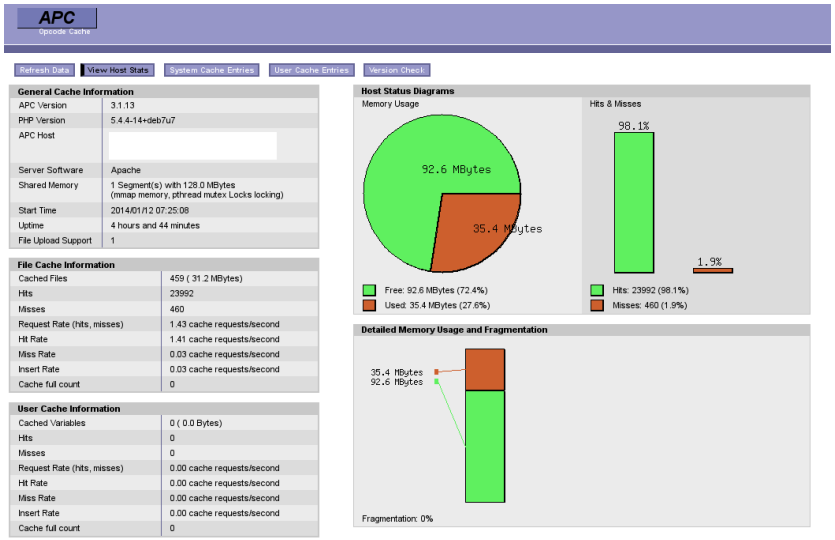
LAM web server

Install a PHP accelerator

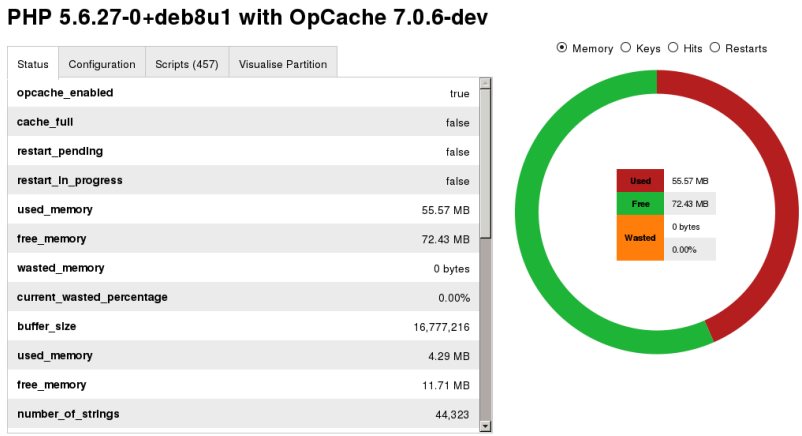
There are tools like APC [http://www.php.net/manual/en/book.apc.php]/OpCache [http://php.net/manual/en/book.opcache.php] (free) or Zend Server [http://www.zend.com/en/products/server/] (commercial) that provide caching of PHP pages to improve performance. They will reduce the time for parsing the PHP pages and IO load.

This is a simply way to enhance performance since APC/OpCache is part of most Linux distributions.

If you use APC then make sure that it uses enough memory (e.g. "apc.shm_size=128M"). You can check the memory usage with the file apc.php that is shipped with APC.



OpCache statistics can be shown with opcache-status [https://github.com/rlerdorf/opcache-status].



Disable session encryption

LAM encrypts sensitive data in your session files. You can disable it to reduce CPU load.