

ENGR3821 Network Engineering  
**NETENG MAJOR ASSIGNMENT**

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# Disclaimer

This report and its contents are permitted to be redistributed on behalf of the author for the express purpose of peer review and grading only.

# Introduction

This report will cover the configuration of a Ubuntu Linux host to allow user login using a network directory server as an authentication provider, specifically through the use of Pluggable Authentication Modules (PAM). It will also cover the setup and population of a directory server running OpenLDAP with dummy data. When fully configured, any user with valid credentials present within the directory will be able to log in and use the system without any extra effort.

# LDAP Server Setup

To get started we need an LDAP server to authenticate off of. For this report we will be using OpenLDAP since it is familiar, though any LDAP server will do. Start by logging in to the host where you will be deploying the LDAP server.

1. Install slapd and some tools that will come in handy later with: `sudo apt install slapd ldap-utils`
  - a. Enter the administrator password for the LDAP server and take note of it, you will need it later
2. Make slapd run at boot with: `sudo systemctl enable slapd`
3. Start slapd with: `sudo systemctl start slapd`

The LDAP server is installed, enabled on startup, and ready to go. Now we need to populate it with some data. A sample LDIF file with dummy company and user data is available on Pastebin here: <https://pastebin.com/raw/pRV3TA6p>. Each user must have the 'posixAccount' object class which also mandates the 'uid', 'uidNumber', 'gidNumber', and 'homeDirectory' attributes<sup>[1]</sup>. The sample data has UIDs derived from email addresses, serial numeric UID and GID attributes starting at 10,000, a home directory under '/home/<uid>', and the password 'SecurePassword123' as an SHA1 hash. If you already have an LDIF file containing users with these attributes, feel free to skip to step 5 and use that instead.

4. Run `wget https://pastebin.com/raw/pRV3TA6p -O sample.ldif` to download the sample LDIF file
5. Import the file into the database with: `ldapadd -cxWD cn=admin,dc=nodomain -f sample.ldif`
  - a. When prompted, enter the administrator password you set in step 1a

The LDAP server is now populated with the sample data set. To test it, make a query with `ldapsearch`. A query to find entries with the user ID 'micah5t6' would look like:

```
$ ldapsearch -b "dc=nodomain" -cx "(uid=micah5t6)"
# extended LDIF
#
# LDAPv3
# base <dc=nodomain> with scope subtree
# filter: (uid=micah5t6)
# requesting: ALL
#
```

```
# Micah Thomas, Statistical misinterpretation, Finance,  
Monopolistic Trading Company.nodomain  
dn: cn=Micah Thomas,ou=Statistical  
misinterpretation,ou=Finance,dc=Monopolistic Trading  
Company,dc=nodomain  
objectClass: organizationalPerson  
objectClass: inetOrgPerson  
objectClass: posixAccount  
cn: Micah Thomas  
sn: Thomas  
mail: micah5t6@unimaginableuniversity.com.ki  
uid: micah5t6  
uidNumber: 10022  
gidNumber: 10022  
homeDirectory: /home/micah5t6  
telephoneNumber: +68685311227  
telephoneNumber: +68685311335  
telephoneNumber: +68685311885  
telephoneNumber: +68685311195  
manager: cn=Martin Clarke,ou=Statistical  
misinterpretation,ou=Finance  
  
# search result  
search: 2  
result: 0 Success  
  
# numResponses: 2  
# numEntries: 1
```

# Authentication Setup

## Overview and Explanation

Before going any further, it is worth understanding the two key components that will be installed in this section. The first are the PAM and the `pam_ldap` modules, and the second are the `nslcd` and the `nss_ldap` modules.

Pluggable Authentication Modules (PAM) is a modular authentication framework which other services or applications can use for user authentication<sup>[2]</sup>. It is modular by design, allowing the system administrator to pick and choose the available authentication methods, the order they occur, and other utilities to facilitate them (e.g. logging or mounting a home directory<sup>[2]</sup>). These modules are stackable, meaning that depending on the result of one module, it may pass responsibility on to the next and so on until a final result is reached and the operation is either allowed or disallowed.

The `pam_ldap` module is a PAM module that we will be using to hook the LDAP server into the system's authentication process. By including it within the PAM stack, the system will be able to use LDAP entries as login credentials<sup>[3]</sup>.

While PAM manages authentication, it does not synchronise users, groups, and other data from the LDAP server to the local machine. This is where `nsswitch` and `nslcd` come in. `nsswitch` provides an API for programs to collect 'name-service information' (i.e. users, groups, emails, passwords, etc.) through a common interface<sup>[4]</sup>. The `nss_ldap` module allows `nsswitch` to use LDAP as a data source<sup>[5]</sup>.

`nslcd` is "a daemon that will do LDAP queries for local processes that want to do user, group and other naming lookups... or do user authentication, authorisation or password modification"<sup>[6]</sup>. For our purposes, `nslcd` will query the LDAP server to synchronise the user list, allowing programs like `passwd` and `sshd` to behave normally when provided with LDAP credentials.

## Client Configuration

Moving over to the other machine, we will install the PAM and NSS modules to integrate the LDAP server as an authentication method for logging in to the system. Fortunately Ubuntu has several packages that automate the installation process.

1. Install the PAM module, NSS module, and nslcd daemon with:  
`sudo apt install ldap-auth-client nslcd`  
The installation script will prompt you for the LDAP server details while it is installing. When prompted:
  - a. Set the LDAP URI to 'ldap://<server\_ip>'
  - b. Set the search base to 'dc=nodomain'
  - c. Use LDAP version 3
  - d. Select 'Yes' to enable password updates
  - e. Select 'No' when asked about a password to retrieve entries
  - f. For the root bind, enter 'cn=admin,dc=nodomain'
  - g. Enter the LDAP administrator password

That covers the configuration of the ldap-auth-client package. The nslcd package will ask once more for the LDAP URI and search base. These should be the same as the ones set in step 1a and 1b.

- h. Set the LDAP URI to 'ldap://<server\_ip>'
  - i. Set the search base to 'dc=nodomain'
2. Set nslcd to run at boot with: `sudo systemctl enable nslcd`
3. Start nslcd with: `sudo systemctl start nslcd`

nsswitch still needs to be configured to use ldap as a provider. To add it to the configuration file:

4. Run `sudo auth-client-config -t nss -p lac_ldap`<sup>[7]</sup>

Those steps should configure the LDAP connection for both PAM and nslcd to use when retrieving login details. However, the LDAP module is not yet a part of the common PAM chain. To enable it:

5. Run `sudo pam-auth-update`
  - a. Using the arrow keys to move and spacebar to toggle, modify the list so that it looks similar to the image below:

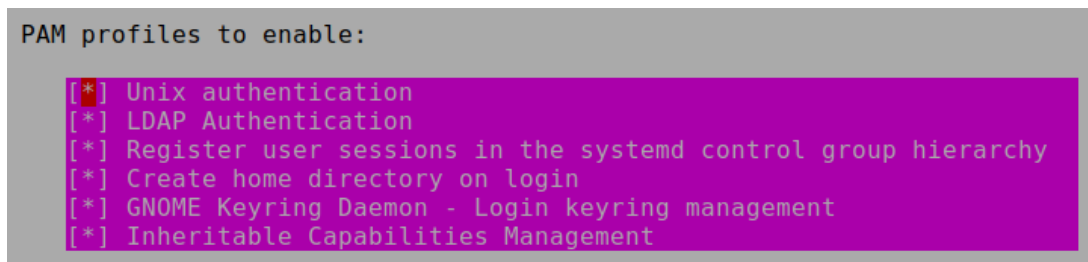


Fig. 1: `pam-auth-update` dialog displaying toggleable PAM modules

**NOTE:** At the very least, Unix and LDAP authentication should be enabled. It is recommended that you also

enable home directory creation so that users are given a home directory when they log in for the first time.

b. Press enter to apply the changes

6. Refresh the nscd cache with: `sudo systemctl restart nscd`

If all went well, nslcd should have pulled each user entry from the directory. Check it by running `getent passwd`. Below is an excerpt of what the output should look like.

```
$ getent passwd

<45 lines removed for brevity>

mtaylor:*:10001:10001:Magnus Taylor:/home/mtaylor:
mario5l5:*:10002:10002:Mario Lewis:/home/mario5l5:
ml2:*:10003:10003:Magnus Lewis:/home/ml2:
micah5w4:*:10004:10004:Micah Wood:/home/micah5w4:
fc4:*:10005:10005:Francesca Cooper:/home/fc4:
fwilliams:*:10006:10006:Frances Williams:/home/fwilliams:
ft6:*:10007:10007:Fran Thomas:/home/ft6:
mm7:*:10008:10008:Mark Martin:/home/mm7:
fran4e5:*:10009:10009:Fran Evans:/home/fran4e5:
ft9:*:10010:10010:Frances Thompson:/home/ft9:

<38 lines removed for brevity>
```

Test that user login works by logging in as one of them. Run `su - <user>` and enter their password ('SecurePassword123' by default). It should drop you into an `sh` shell as shown in Figure 2. If not, go back and make sure you have not missed any of the steps in this section. Check the journal with `journalctl` and see if any of the services we just configured have errors.

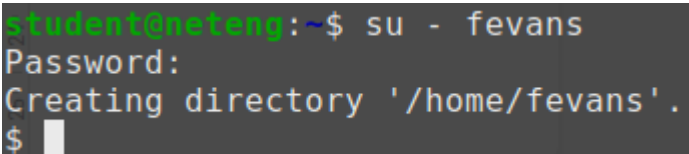
A terminal window showing a user logging in as 'fevans'. The prompt is 'student@neteng:~\$'. The user enters 'su - fevans'. The prompt changes to 'Password:'. The user enters a password. The prompt changes to 'Creating directory '/home/fevans''. The user enters a password. The prompt changes to '\$'.

Fig. 2: Result of logging in as 'fevans'

If the login is successful, log out and try logging in to several other users like in Figure 3. They should all work with the same password by default.



Confirm that UNIX authentication still works by attempting to log in as yourself with `su - <user>`. It should look similar to Figure 4. If it fails, repeat step 5 and make sure to enable 'UNIX authentication'.

```
student@neteng:~$ su - fevans
Password:
$ exit
student@neteng:~$ su - mthompson
Password:
Creating directory '/home/mthompson'.
$ exit
student@neteng:~$ su - murray.robinson
Password:
Creating directory '/home/murray.robinson'.
$ exit
student@neteng:~$ su - mc14
Password:
Creating directory '/home/mc14'.
$ exit
```

Fig. 3: Multiple login attempts to various users. Note that the home directories were created for users that had not logged in.

```
student@neteng:~$ su - student
Password:
student@neteng:~$
```

Fig. 4: Result of logging in as a local user

## Future Considerations

Currently the credentials for each user are being sent over the network via the 'ldap://' protocol, which is insecure. User details - including passwords - can be easily read from network traffic by an attacker. It is highly recommended to set up encryption with TLS and use the 'ldaps://' protocol in a production environment.

# Bibliography

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## Appendices

This section is very long due to the LDIF file being quite large. It is the final section of this document. There is only one appendix.

### Appendix A: Sample LDIF File

A copy of the sample LDIF file has been included in case the copy hosted on Pastebin becomes unavailable. If available, use the online copy available here: <https://pastebin.com/raw/pRV3TA6p>  
Font size has been reduced to minimise the page count.

```
dn: dc=Lanthanide Productions,dc=nodomain
objectClass: dcObject
objectClass: organization
dc: Lanthanide Productions
o: Lanthanide Productions.

dn: dc=Monopolistic Trading Company,dc=nodomain
objectClass: dcObject
objectClass: organization
dc: Monopolistic Trading Company
o: Monopolistic Trading Company.

dn: dc=Monopolistic Used Vehicles,dc=nodomain
objectClass: dcObject
objectClass: organization
dc: Monopolistic Used Vehicles
```

o: Monopolistic Used Vehicles.

dn: dc=Neo-Imperial Exports,dc=nodomain  
objectClass: dcObject  
objectClass: organization  
dc: Neo-Imperial Exports  
o: Neo-Imperial Exports.

dn: dc=Unimaginable University,dc=nodomain  
objectClass: dcObject  
objectClass: organization  
dc: Unimaginable University  
o: Unimaginable University.

dn: ou=Sub-divisions,dc=Neo-Imperial Exports,dc=nodomain  
objectClass: organizationalUnit  
ou: Sub-divisions

dn: ou=Pest control,ou=Sub-divisions,dc=Neo-Imperial Exports,dc=nodomain  
objectClass: organizationalUnit  
ou: Pest control

dn: ou=Consolidation,dc=Lanthanide Productions,dc=nodomain  
objectClass: organizationalUnit  
ou: Consolidation

dn: ou=Research,ou=Consolidation,dc=Lanthanide Productions,dc=nodomain  
objectClass: organizationalUnit  
ou: Research

dn: ou=Human resources,ou=Research,ou=Consolidation,dc=Lanthanide  
Productions,dc=nodomain  
objectClass: organizationalUnit  
ou: Human resources

dn: ou=Environmental protection,ou=Research,ou=Consolidation,dc=Lanthanide  
Productions,dc=nodomain  
objectClass: organizationalUnit  
ou: Environmental protection

dn: ou=Misappropriation,dc=Unimaginable University,dc=nodomain  
objectClass: organizationalUnit  
ou: Misappropriation

dn: ou=Manufacture,ou=Misappropriation,dc=Unimaginable University,dc=nodomain  
objectClass: organizationalUnit  
ou: Manufacture

dn: ou=Embezzlement,ou=Misappropriation,dc=Unimaginable University,dc=nodomain  
objectClass: organizationalUnit  
ou: Embezzlement

dn: ou=market punctuation,dc=Monopolistic Used Vehicles,dc=nodomain  
objectClass: organizationalUnit  
ou: market punctuation

dn: ou=Environmental protection,ou=market punctuation,dc=Monopolistic Used  
Vehicles,dc=nodomain  
objectClass: organizationalUnit  
ou: Environmental protection

dn: ou=Manufacture,ou=Environmental protection,ou=market punctuation,dc=Monopolistic Used Vehicles,dc=nodomain  
objectClass: organizationalUnit  
ou: Manufacture

dn: ou=Finance,dc=Monopolistic Trading Company,dc=nodomain  
objectClass: organizationalUnit  
ou: Finance

dn: ou=Statistical misinterpretation,ou=Finance,dc=Monopolistic Trading Company,dc=nodomain  
objectClass: organizationalUnit  
ou: Statistical misinterpretation

dn: cn=Magnus Taylor,ou=Environmental protection,ou=Research,ou=Consolidation,dc=Lanthanide Productions,dc=nodomain  
objectClass: organizationalPerson  
objectClass: inetOrgPerson  
objectClass: posixAccount  
cn: Magnus Taylor  
sn: Taylor  
mail: mtaylor@monopolistictradingcompany.com.nz  
uid: mtaylor  
uidNumber: 10001  
gidNumber: 10001  
homeDirectory: /home/mtaylor  
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ

dn: cn=Mario Lewis,ou=Human resources,ou=Research,ou=Consolidation,dc=Lanthanide Productions,dc=nodomain  
objectClass: organizationalPerson  
objectClass: inetOrgPerson  
objectClass: posixAccount  
cn: Mario Lewis  
sn: Lewis  
mail: mario515@lanthanideproductions.com.nz  
uid: mario515  
uidNumber: 10002  
gidNumber: 10002  
homeDirectory: /home/mario515  
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ  
telephoneNumber: +6589895177  
manager: cn=Magnus Taylor,ou=Environmental protection,ou=Research,ou=Consolidation

dn: cn=Magnus Lewis,ou=market punctuation,dc=Monopolistic Used Vehicles,dc=nodomain  
objectClass: organizationalPerson  
objectClass: inetOrgPerson  
objectClass: posixAccount  
cn: Magnus Lewis  
sn: Lewis  
mail: ml2@monopolistictradingcompany.com.nz  
uid: ml2  
uidNumber: 10003  
gidNumber: 10003  
homeDirectory: /home/ml2  
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ

dn: cn=Micah Wood,ou=market punctuation,dc=Monopolistic Used Vehicles,dc=nodomain  
objectClass: organizationalPerson  
objectClass: inetOrgPerson

objectClass: posixAccount  
cn: Micah Wood  
sn: Wood  
mail: micah5w4@lanthanideproductions.com.nz  
uid: micah5w4  
uidNumber: 10004  
gidNumber: 10004  
homeDirectory: /home/micah5w4  
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ  
telephoneNumber: +6589895625  
telephoneNumber: +6589895482  
telephoneNumber: +6589895814  
telephoneNumber: +6589895077  
manager: cn=Magnus Lewis,ou=market punctuation

dn: cn=Francesca Cooper,ou=Manufacture,ou=Misappropriation,dc=Unimaginable  
University,dc=nodomain  
objectClass: organizationalPerson  
objectClass: inetOrgPerson  
objectClass: posixAccount  
cn: Francesca Cooper  
sn: Cooper  
mail: fc4@unimaginableuniversity.com.ki  
uid: fc4  
uidNumber: 10005  
gidNumber: 10005  
homeDirectory: /home/fc4  
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ

dn: cn=Frances Williams,ou=Human resources,ou=Research,ou=Consolidation,dc=Lanthanide  
Productions,dc=nodomain  
objectClass: organizationalPerson  
objectClass: inetOrgPerson  
objectClass: posixAccount  
cn: Frances Williams  
sn: Williams  
mail: fwilliams@lanthanideproductions.com.nz  
uid: fwilliams  
uidNumber: 10006  
gidNumber: 10006  
homeDirectory: /home/fwilliams  
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ  
manager: cn=Magnus Taylor,ou=Environmental protection,ou=Research,ou=Consolidation

dn: cn=Fran Thomas,ou=Statistical misinterpretation,ou=Finance,dc=Monopolistic Trading  
Company,dc=nodomain  
objectClass: organizationalPerson  
objectClass: inetOrgPerson  
objectClass: posixAccount  
cn: Fran Thomas  
sn: Thomas  
mail: ft6@neoimperialexports.com.aq  
uid: ft6  
uidNumber: 10007  
gidNumber: 10007  
homeDirectory: /home/ft6  
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ  
telephoneNumber: +672101935

dn: cn=Mark Martin,ou=Embezzlement,ou=Misappropriation,dc=Unimaginable  
University,dc=nodomain

```
objectClass: organizationalPerson
objectClass: inetOrgPerson
objectClass: posixAccount
cn: Mark Martin
sn: Martin
mail: mm7@lanthanideproductions.com.nz
uid: mm7
uidNumber: 10008
gidNumber: 10008
homeDirectory: /home/mm7
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ
telephoneNumber: +6589895749
telephoneNumber: +6589895275
telephoneNumber: +6589895569
manager: cn=Francesca Cooper,ou=Manufacture,ou=Misappropriation

dn: cn=Fran Evans,ou=Embezzlement,ou=Misappropriation,dc=Unimaginable
University,dc=nodomain
objectClass: organizationalPerson
objectClass: inetOrgPerson
objectClass: posixAccount
cn: Fran Evans
sn: Evans
mail: fran4e5@lanthanideproductions.com.nz
uid: fran4e5
uidNumber: 10009
gidNumber: 10009
homeDirectory: /home/fran4e5
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ
telephoneNumber: +6589895884
telephoneNumber: +6589895991
telephoneNumber: +6589895579
manager: cn=Mark Martin,ou=Embezzlement,ou=Misappropriation

dn: cn=Frances Thompson,ou=Research,ou=Consolidation,dc=Lanthanide
Productions,dc=nodomain
objectClass: organizationalPerson
objectClass: inetOrgPerson
objectClass: posixAccount
cn: Frances Thompson
sn: Thompson
mail: ft9@monopolistictradingcompany.com.nz
uid: ft9
uidNumber: 10010
gidNumber: 10010
homeDirectory: /home/ft9
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ
manager: cn=Mario Lewis,ou=Human resources,ou=Research,ou=Consolidation

dn: cn=Frances Roberts,ou=Sub-divisions,dc=Neo-Imperial Exports,dc=nodomain
objectClass: organizationalPerson
objectClass: inetOrgPerson
objectClass: posixAccount
cn: Frances Roberts
sn: Roberts
mail: frances7r7@monopolistictradingcompany.com.nz
uid: frances7r7
uidNumber: 10011
gidNumber: 10011
homeDirectory: /home/frances7r7
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ
```

telephoneNumber: +6505679264  
telephoneNumber: +6505679521  
telephoneNumber: +6505679171

dn: cn=Micah Evans,ou=Sub-divisions,dc=Neo-Imperial Exports,dc=nodomain  
objectClass: organizationalPerson  
objectClass: inetOrgPerson  
objectClass: posixAccount  
cn: Micah Evans  
sn: Evans  
mail: mevans@lanthanideproductions.com.nz  
uid: mevans  
uidNumber: 10012  
gidNumber: 10012  
homeDirectory: /home/mevans  
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ  
telephoneNumber: +6589895381  
manager: cn=Frances Roberts,ou=Sub-divisions

dn: cn=Micah Thompson,ou=Environmental protection,ou=market punctuation,dc=Monopolistic  
Used Vehicles,dc=nodomain  
objectClass: organizationalPerson  
objectClass: inetOrgPerson  
objectClass: posixAccount  
cn: Micah Thompson  
sn: Thompson  
mail: mthompson@monopolistictradingcompany.com.nz  
uid: mthompson  
uidNumber: 10013  
gidNumber: 10013  
homeDirectory: /home/mthompson  
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ  
telephoneNumber: +6505679990  
telephoneNumber: +6505679422  
telephoneNumber: +6505679305  
telephoneNumber: +6505679570  
manager: cn=Micah Wood,ou=market punctuation

dn: cn=Murray Robinson,ou=Embezzlement,ou=Misappropriation,dc=Unimaginable  
University,dc=nodomain  
objectClass: organizationalPerson  
objectClass: inetOrgPerson  
objectClass: posixAccount  
cn: Murray Robinson  
sn: Robinson  
mail: murray.robinson@monopolisticusedvehicles.com.aq  
uid: murray.robinson  
uidNumber: 10014  
gidNumber: 10014  
homeDirectory: /home/murray.robinson  
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ  
telephoneNumber: +672112596  
manager: cn=Fran Evans,ou=Embezzlement,ou=Misappropriation

dn: cn=Martin Clarke,ou=Statistical misinterpretation,ou=Finance,dc=Monopolistic Trading  
Company,dc=nodomain  
objectClass: organizationalPerson  
objectClass: inetOrgPerson  
objectClass: posixAccount  
cn: Martin Clarke  
sn: Clarke

mail: mc14@monopolistictradingcompany.com.nz  
uid: mc14  
uidNumber: 10015  
gidNumber: 10015  
homeDirectory: /home/mc14  
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ  
telephoneNumber: +6505679010  
manager: cn=Fran Thomas,ou=Statistical misinterpretation,ou=Finance

dn: cn=Mario Watson,ou=market punctuation,dc=Monopolistic Used Vehicles,dc=nodomain  
objectClass: organizationalPerson  
objectClass: inetOrgPerson  
objectClass: posixAccount  
cn: Mario Watson  
sn: Watson  
mail: mario.watson@monopolistictradingcompany.com.nz  
uid: mario.watson  
uidNumber: 10016  
gidNumber: 10016  
homeDirectory: /home/mario.watson  
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ  
telephoneNumber: +6505679779  
telephoneNumber: +6505679273  
telephoneNumber: +6505679750  
manager: cn=Micah Wood,ou=market punctuation

dn: cn=Martin James,ou=Research,ou=Consolidation,dc=Lanthanide Productions,dc=nodomain  
objectClass: organizationalPerson  
objectClass: inetOrgPerson  
objectClass: posixAccount  
cn: Martin James  
sn: James  
mail: martin6j5@monopolistictradingcompany.com.nz  
uid: martin6j5  
uidNumber: 10017  
gidNumber: 10017  
homeDirectory: /home/martin6j5  
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ  
telephoneNumber: +6505679736  
manager: cn=Magnus Taylor,ou=Environmental protection,ou=Research,ou=Consolidation

dn: cn=Magnus Wood,ou=Pest control,ou=Sub-divisions,dc=Neo-Imperial Exports,dc=nodomain  
objectClass: organizationalPerson  
objectClass: inetOrgPerson  
objectClass: posixAccount  
cn: Magnus Wood  
sn: Wood  
mail: mwood@monopolisticusedvehicles.com.aq  
uid: mwood  
uidNumber: 10018  
gidNumber: 10018  
homeDirectory: /home/mwood  
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ  
telephoneNumber: +672112282  
telephoneNumber: +672112962  
telephoneNumber: +672112613  
telephoneNumber: +672112968  
manager: cn=Frances Roberts,ou=Sub-divisions

dn: cn=Murray Walker,ou=Embezzlement,ou=Misappropriation,dc=Unimaginable University,dc=nodomain



```
objectClass: organizationalPerson
objectClass: inetOrgPerson
objectClass: posixAccount
cn: Murray Walker
sn: Walker
mail: mw18@monopolistictradingcompany.com.nz
uid: mw18
uidNumber: 10019
gidNumber: 10019
homeDirectory: /home/mw18
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ
telephoneNumber: +6505679616
manager: cn=Murray Robinson,ou=Embezzlement,ou=Misappropriation

dn: cn=Micah Clarke,ou=Consolidation,dc=Lanthanide Productions,dc=nodomain
objectClass: organizationalPerson
objectClass: inetOrgPerson
objectClass: posixAccount
cn: Micah Clarke
sn: Clarke
mail: micah.clarke@unimaginableuniversity.com.ki
uid: micah.clarke
uidNumber: 10020
gidNumber: 10020
homeDirectory: /home/micah.clarke
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ
manager: cn=Frances Thompson,ou=Research,ou=Consolidation

dn: cn=Magnus Harris,ou=Consolidation,dc=Lanthanide Productions,dc=nodomain
objectClass: organizationalPerson
objectClass: inetOrgPerson
objectClass: posixAccount
cn: Magnus Harris
sn: Harris
mail: magnus6h6@unimaginableuniversity.com.ki
uid: magnus6h6
uidNumber: 10021
gidNumber: 10021
homeDirectory: /home/magnus6h6
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ
telephoneNumber: +68685311493
telephoneNumber: +68685311670
manager: cn=Frances Thompson,ou=Research,ou=Consolidation

dn: cn=Micah Thomas,ou=Statistical misinterpretation,ou=Finance,dc=Monopolistic Trading
Company,dc=nodomain
objectClass: organizationalPerson
objectClass: inetOrgPerson
objectClass: posixAccount
cn: Micah Thomas
sn: Thomas
mail: micah5t6@unimaginableuniversity.com.ki
uid: micah5t6
uidNumber: 10022
gidNumber: 10022
homeDirectory: /home/micah5t6
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ
telephoneNumber: +68685311227
telephoneNumber: +68685311335
telephoneNumber: +68685311885
telephoneNumber: +68685311195
```

manager: cn=Martin Clarke,ou=Statistical misinterpretation,ou=Finance

dn: cn=Fiona Lee,ou=Misappropriation,dc=Unimaginable University,dc=nodomain  
objectClass: organizationalPerson  
objectClass: inetOrgPerson  
objectClass: posixAccount  
cn: Fiona Lee  
sn: Lee  
mail: fl22@unimaginableuniversity.com.ki  
uid: fl22  
uidNumber: 10023  
gidNumber: 10023  
homeDirectory: /home/fl22  
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ  
telephoneNumber: +68685311000  
telephoneNumber: +68685311737  
telephoneNumber: +68685311986  
telephoneNumber: +68685311852  
manager: cn=Fran Evans,ou=Embezzelment,ou=Misappropriation

dn: cn=Freda King,ou=Human resources,ou=Research,ou=Consolidation,dc=Lanthanide  
Productions,dc=nodomain  
objectClass: organizationalPerson  
objectClass: inetOrgPerson  
objectClass: posixAccount  
cn: Freda King  
sn: King  
mail: fk23@unimaginableuniversity.com.ki  
uid: fk23  
uidNumber: 10024  
gidNumber: 10024  
homeDirectory: /home/fk23  
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ  
telephoneNumber: +68685311652  
telephoneNumber: +68685311864  
telephoneNumber: +68685311177  
manager: cn=Frances Thompson,ou=Research,ou=Consolidation

dn: cn=Francesca Brown,ou=Pest control,ou=Sub-divisions,dc=Neo-Imperial  
Exports,dc=nodomain  
objectClass: organizationalPerson  
objectClass: inetOrgPerson  
objectClass: posixAccount  
cn: Francesca Brown  
sn: Brown  
mail: francesca.brown@unimaginableuniversity.com.ki  
uid: francesca.brown  
uidNumber: 10025  
gidNumber: 10025  
homeDirectory: /home/francesca.brown  
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ  
telephoneNumber: +68685311230  
telephoneNumber: +68685311021  
manager: cn=Micah Evans,ou=Sub-divisions

dn: cn=Fifi Wright,ou=Finance,dc=Monopolistic Trading Company,dc=nodomain  
objectClass: organizationalPerson  
objectClass: inetOrgPerson  
objectClass: posixAccount  
cn: Fifi Wright  
sn: Wright

mail: fw25@neoimperialexports.com.aq

uid: fw25

uidNumber: 10026

gidNumber: 10026

homeDirectory: /home/fw25

userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ

manager: cn=Micah Thomas,ou=Statistical misinterpretation,ou=Finance

dn: cn=Martin Lee,ou=Environmental protection,ou=market punctuation,dc=Monopolistic Used Vehicles,dc=nodomain

objectClass: organizationalPerson

objectClass: inetOrgPerson

objectClass: posixAccount

cn: Martin Lee

sn: Lee

mail: ml26@monopolisticusedvehicles.com.aq

uid: ml26

uidNumber: 10027

gidNumber: 10027

homeDirectory: /home/ml26

userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ

manager: cn=Mario Watson,ou=market punctuation

dn: cn=Flora Wood,ou=market punctuation,dc=Monopolistic Used Vehicles,dc=nodomain

objectClass: organizationalPerson

objectClass: inetOrgPerson

objectClass: posixAccount

cn: Flora Wood

sn: Wood

mail: fw27@lanthanideproductions.com.nz

uid: fw27

uidNumber: 10028

gidNumber: 10028

homeDirectory: /home/fw27

userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ

telephoneNumber: +6589895724

manager: cn=Micah Wood,ou=market punctuation

dn: cn=Morgan Jones,ou=Consolidation,dc=Lanthanide Productions,dc=nodomain

objectClass: organizationalPerson

objectClass: inetOrgPerson

objectClass: posixAccount

cn: Morgan Jones

sn: Jones

mail: morgan.jones@unimaginableuniversity.com.ki

uid: morgan.jones

uidNumber: 10029

gidNumber: 10029

homeDirectory: /home/morgan.jones

userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ

telephoneNumber: +68685311957

telephoneNumber: +68685311577

telephoneNumber: +68685311346

manager: cn=Frances Thompson,ou=Research,ou=Consolidation

dn: cn=Fiona Jones,ou=Statistical misinterpretation,ou=Finance,dc=Monopolistic Trading Company,dc=nodomain

objectClass: organizationalPerson

objectClass: inetOrgPerson

objectClass: posixAccount

cn: Fiona Jones

sn: Jones  
mail: fiona5j5@monopolistictradingcompany.com.nz  
uid: fiona5j5  
uidNumber: 10030  
gidNumber: 10030  
homeDirectory: /home/fiona5j5  
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ  
telephoneNumber: +6505679911  
telephoneNumber: +6505679509  
telephoneNumber: +6505679862  
manager: cn=Martin Clarke,ou=Statistical misinterpretation,ou=Finance

dn: cn=Frances Wood,ou=Pest control,ou=Sub-divisions,dc=Neo-Imperial Exports,dc=nodomain  
objectClass: organizationalPerson  
objectClass: inetOrgPerson  
objectClass: posixAccount  
cn: Frances Wood  
sn: Wood  
mail: frances.wood@monopolisticusedvehicles.com.aq  
uid: frances.wood  
uidNumber: 10031  
gidNumber: 10031  
homeDirectory: /home/frances.wood  
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ  
telephoneNumber: +672112928  
telephoneNumber: +672112293  
telephoneNumber: +672112101  
manager: cn=Magnus Wood,ou=Pest control,ou=Sub-divisions

dn: cn=Frances Thomas,ou=market punctuation,dc=Monopolistic Used Vehicles,dc=nodomain  
objectClass: organizationalPerson  
objectClass: inetOrgPerson  
objectClass: posixAccount  
cn: Frances Thomas  
sn: Thomas  
mail: fthomas@unimaginableuniversity.com.ki  
uid: fthomas  
uidNumber: 10032  
gidNumber: 10032  
homeDirectory: /home/fthomas  
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ  
telephoneNumber: +68685311325  
manager: cn=Micah Thompson,ou=Environmental protection,ou=market punctuation

dn: cn=Matthew Walker,ou=Statistical misinterpretation,ou=Finance,dc=Monopolistic Trading Company,dc=nodomain  
objectClass: organizationalPerson  
objectClass: inetOrgPerson  
objectClass: posixAccount  
cn: Matthew Walker  
sn: Walker  
mail: mw32@unimaginableuniversity.com.ki  
uid: mw32  
uidNumber: 10033  
gidNumber: 10033  
homeDirectory: /home/mw32  
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ  
telephoneNumber: +68685311090  
telephoneNumber: +68685311768  
manager: cn=Fifi Wright,ou=Finance

dn: cn=Fran Green,ou=Consolidation,dc=Lanthanide Productions,dc=nodomain  
objectClass: organizationalPerson  
objectClass: inetOrgPerson  
objectClass: posixAccount  
cn: Fran Green  
sn: Green  
mail: fgreen@neoimperialexports.com.aq  
uid: fgreen  
uidNumber: 10034  
gidNumber: 10034  
homeDirectory: /home/fgreen  
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ  
telephoneNumber: +672101020  
manager: cn=Magnus Harris,ou=Consolidation

dn: cn=Fiona Smith,ou=Embezzlement,ou=Misappropriation,dc=Unimaginable  
University,dc=nodomain  
objectClass: organizationalPerson  
objectClass: inetOrgPerson  
objectClass: posixAccount  
cn: Fiona Smith  
sn: Smith  
mail: fiona.smith@monopolisticusedvehicles.com.aq  
uid: fiona.smith  
uidNumber: 10035  
gidNumber: 10035  
homeDirectory: /home/fiona.smith  
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ  
telephoneNumber: +672112431  
telephoneNumber: +672112770  
telephoneNumber: +672112726  
manager: cn=Murray Robinson,ou=Embezzlement,ou=Misappropriation

dn: cn=Matthew Wilson,ou=Environmental protection,ou=market punctuation,dc=Monopolistic  
Used Vehicles,dc=nodomain  
objectClass: organizationalPerson  
objectClass: inetOrgPerson  
objectClass: posixAccount  
cn: Matthew Wilson  
sn: Wilson  
mail: matthew.wilson@monopolisticusedvehicles.com.aq  
uid: matthew.wilson  
uidNumber: 10036  
gidNumber: 10036  
homeDirectory: /home/matthew.wilson  
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ  
manager: cn=Martin Lee,ou=Environmental protection,ou=market punctuation

dn: cn=Murray Johnson,ou=market punctuation,dc=Monopolistic Used Vehicles,dc=nodomain  
objectClass: organizationalPerson  
objectClass: inetOrgPerson  
objectClass: posixAccount  
cn: Murray Johnson  
sn: Johnson  
mail: murray6j7@lanthanideproductions.com.nz  
uid: murray6j7  
uidNumber: 10037  
gidNumber: 10037  
homeDirectory: /home/murray6j7  
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ  
telephoneNumber: +6589895541

telephoneNumber: +6589895039  
telephoneNumber: +6589895553  
manager: cn=Martin Lee,ou=Environmental protection,ou=market punctuation

dn: cn=Flora Brown,ou=Environmental  
protection,ou=Research,ou=Consolidation,dc=Lanthanide Productions,dc=nodomain  
objectClass: organizationalPerson  
objectClass: inetOrgPerson  
objectClass: posixAccount  
cn: Flora Brown  
sn: Brown  
mail: flora5b5@monopolisticusedvehicles.com.aq  
uid: flora5b5  
uidNumber: 10038  
gidNumber: 10038  
homeDirectory: /home/flora5b5  
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ  
telephoneNumber: +672112719  
telephoneNumber: +672112368  
telephoneNumber: +672112636  
telephoneNumber: +672112684  
manager: cn=Martin James,ou=Research,ou=Consolidation

dn: cn=Murray Jones,ou=Manufacture,ou=Misappropriation,dc=Unimaginable  
University,dc=nodomain  
objectClass: organizationalPerson  
objectClass: inetOrgPerson  
objectClass: posixAccount  
cn: Murray Jones  
sn: Jones  
mail: mjones@neoimperialexports.com.aq  
uid: mjones  
uidNumber: 10039  
gidNumber: 10039  
homeDirectory: /home/mjones  
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ  
telephoneNumber: +672101386  
telephoneNumber: +672101249  
telephoneNumber: +672101587  
manager: cn=Mark Martin,ou=Embezzlement,ou=Misappropriation

dn: cn=Fran Walker,ou=Environmental protection,ou=market punctuation,dc=Monopolistic  
Used Vehicles,dc=nodomain  
objectClass: organizationalPerson  
objectClass: inetOrgPerson  
objectClass: posixAccount  
cn: Fran Walker  
sn: Walker  
mail: fwalker@unimaginableuniversity.com.ki  
uid: fwalker  
uidNumber: 10040  
gidNumber: 10040  
homeDirectory: /home/fwalker  
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ  
telephoneNumber: +68685311965  
telephoneNumber: +68685311046  
telephoneNumber: +68685311009  
telephoneNumber: +68685311507  
manager: cn=Murray Johnson,ou=market punctuation

dn: cn=Mario Lee,ou=Embezzlement,ou=Misappropriation,dc=Unimaginable University,dc=nodomain  
objectClass: organizationalPerson  
objectClass: inetOrgPerson  
objectClass: posixAccount  
cn: Mario Lee  
sn: Lee  
mail: mario5l3@unimaginableuniversity.com.ki  
uid: mario5l3  
uidNumber: 10041  
gidNumber: 10041  
homeDirectory: /home/mario5l3  
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ  
telephoneNumber: +68685311535  
telephoneNumber: +68685311224  
telephoneNumber: +68685311114  
telephoneNumber: +68685311903  
manager: cn=Fiona Smith,ou=Embezzlement,ou=Misappropriation

dn: cn=Fifi Watson,ou=Human resources,ou=Research,ou=Consolidation,dc=Lanthanide Productions,dc=nodomain  
objectClass: organizationalPerson  
objectClass: inetOrgPerson  
objectClass: posixAccount  
cn: Fifi Watson  
sn: Watson  
mail: fwatson@neoimperialexports.com.aq  
uid: fwatson  
uidNumber: 10042  
gidNumber: 10042  
homeDirectory: /home/fwatson  
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ  
telephoneNumber: +672101913  
telephoneNumber: +672101790  
telephoneNumber: +672101517  
telephoneNumber: +672101514  
manager: cn=Martin James,ou=Research,ou=Consolidation

dn: cn=Fiona Jackson,ou=Statistical misinterpretation,ou=Finance,dc=Monopolistic Trading Company,dc=nodomain  
objectClass: organizationalPerson  
objectClass: inetOrgPerson  
objectClass: posixAccount  
cn: Fiona Jackson  
sn: Jackson  
mail: fiona5j7@neoimperialexports.com.aq  
uid: fiona5j7  
uidNumber: 10043  
gidNumber: 10043  
homeDirectory: /home/fiona5j7  
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ  
telephoneNumber: +672101916  
telephoneNumber: +672101891  
telephoneNumber: +672101415  
telephoneNumber: +672101277  
manager: cn=Micah Thomas,ou=Statistical misinterpretation,ou=Finance

dn: cn=Fleur Lee,ou=Environmental protection,ou=market punctuation,dc=Monopolistic Used Vehicles,dc=nodomain  
objectClass: organizationalPerson  
objectClass: inetOrgPerson

```
objectClass: posixAccount
cn: Fleur Lee
sn: Lee
mail: fleur.lee@neoimperialexports.com.aq
uid: fleur.lee
uidNumber: 10044
gidNumber: 10044
homeDirectory: /home/fleur.lee
userPassword: {SSHA}DAxvHEcvLGehazVC0zRwnOWBapmyNIkQ
telephoneNumber: +672101544
telephoneNumber: +672101468
telephoneNumber: +672101214
manager: cn=Mario Watson,ou=market punctuation

dn: cn=Mario Johnson,ou=Environmental protection,ou=market punctuation,dc=Monopolistic
Used Vehicles,dc=nodomain
objectClass: organizationalPerson
objectClass: inetOrgPerson
objectClass: posixAccount
cn: Mario Johnson
sn: Johnson
mail: mario5j7@neoimperialexports.com.aq
uid: mario5j7
uidNumber: 10045
gidNumber: 10045
homeDirectory: /home/mario5j7
userPassword: {SSHA}DAxvHEcvLGehazVC0zRwnOWBapmyNIkQ
telephoneNumber: +672101267
telephoneNumber: +672101628
telephoneNumber: +672101666
manager: cn=Matthew Wilson,ou=Environmental protection,ou=market punctuation

dn: cn=Fay Evans,ou=Consolidation,dc=Lanthanide Productions,dc=nodomain
objectClass: organizationalPerson
objectClass: inetOrgPerson
objectClass: posixAccount
cn: Fay Evans
sn: Evans
mail: fevans@monopolisticusedvehicles.com.aq
uid: fevans
uidNumber: 10046
gidNumber: 10046
homeDirectory: /home/fevans
userPassword: {SSHA}DAxvHEcvLGehazVC0zRwnOWBapmyNIkQ
manager: cn=Fifi Watson,ou=Human resources,ou=Research,ou=Consolidation

dn: cn=Murray King,ou=Research,ou=Consolidation,dc=Lanthanide Productions,dc=nodomain
objectClass: organizationalPerson
objectClass: inetOrgPerson
objectClass: posixAccount
cn: Murray King
sn: King
mail: mking@lanthanideproductions.com.nz
uid: mking
uidNumber: 10047
gidNumber: 10047
homeDirectory: /home/mking
userPassword: {SSHA}DAxvHEcvLGehazVC0zRwnOWBapmyNIkQ
telephoneNumber: +6589895377
manager: cn=Frances Williams,ou=Human resources,ou=Research,ou=Consolidation
```



```
dn: cn=Matthew Smith,ou=Manufacture,ou=Misappropriation,dc=Unimaginable
University,dc=nodomain
objectClass: organizationalPerson
objectClass: inetOrgPerson
objectClass: posixAccount
cn: Matthew Smith
sn: Smith
mail: msmith@monopolistictradingcompany.com.nz
uid: msmith
uidNumber: 10048
gidNumber: 10048
homeDirectory: /home/msmith
userPassword: {SSHA}DAXvHEcvLGehazVC0zRwnOWBapmyNIkQ
manager: cn=Mario Lee,ou=Embezzelment,ou=Misappropriation
```