Implementing POP3 and IMAP4 Using Dovecot

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(Built on materials developed by Joel Jaeggli)

What is POP3

- POP3 stands for Post Office Protocol ver 3
- Described in RFC1913
- Runs on TCP Port 110 as a client server function
- Allows for a maildrop service (similar to the post box mail service) hence the name
- By design its limited in features to download and delete email from server
- Security was also limited to using APOP (md5 hash for authentication
- RFC 2449 proposed POP3 extensions which included SASL Mechanism, Expiry, Pipelining, etc.
- RFC 2595 describes using TLS with POP3 also known as POP3s and runs on port 995

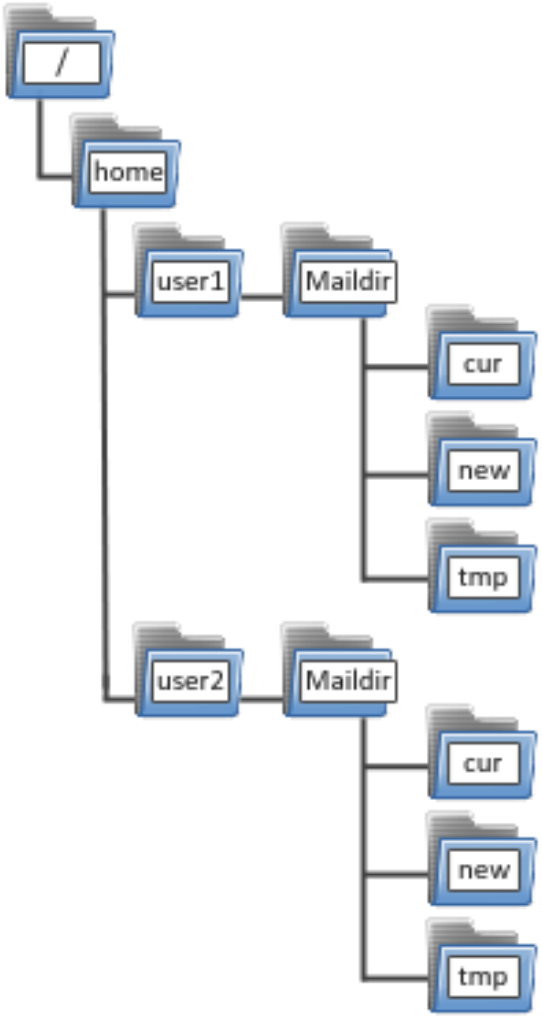
What is IMAP4?

- Internet Message Access Protocol version 4
- Described in RFC 1730
- Runs on TCP Port 143 as client-server function
- More advanced in features compared to POP3
- IMAP4 stores mail on server and copies can be transferred to the client on request.
- By default only the message headers are sent to the client, the rest of the message is accessed on opening the email.
- Allows client to access and manipulate email residing on a server, creation of folders, filters, etc.
- RFC 1731 describes the IMAP Authentication Mechanisms
- RFC 2595 describes using TLS with IMAP4 running on TCP port 993

Mail Storage Formats

- Mailbox Format (Mbox)
- Defined in RFC 4155
- All messages in an Mbox mailbox are concatenated and stored as a plain text in a single file
- Mails are stored in RFC822 format with a blank space separating each message (2 spaces as each message has one space) and “From” determining start of next message.
- Mbox has a distinct disadvantage in cases of large mailbox (a single large file) requires more resources to read/open and can be slow depending on the servers load.

Maildir Storage Format



- Mail Directory Format (Maildir)
- Each message is stored in a separate file with a unique name and each folder in a directory
- Maildir++ provides extension to the Maildir specification providing support for subfolders and quotas.
- Maildir directory has 3 folders **temp**, **new** and **current**

How Maildir Works

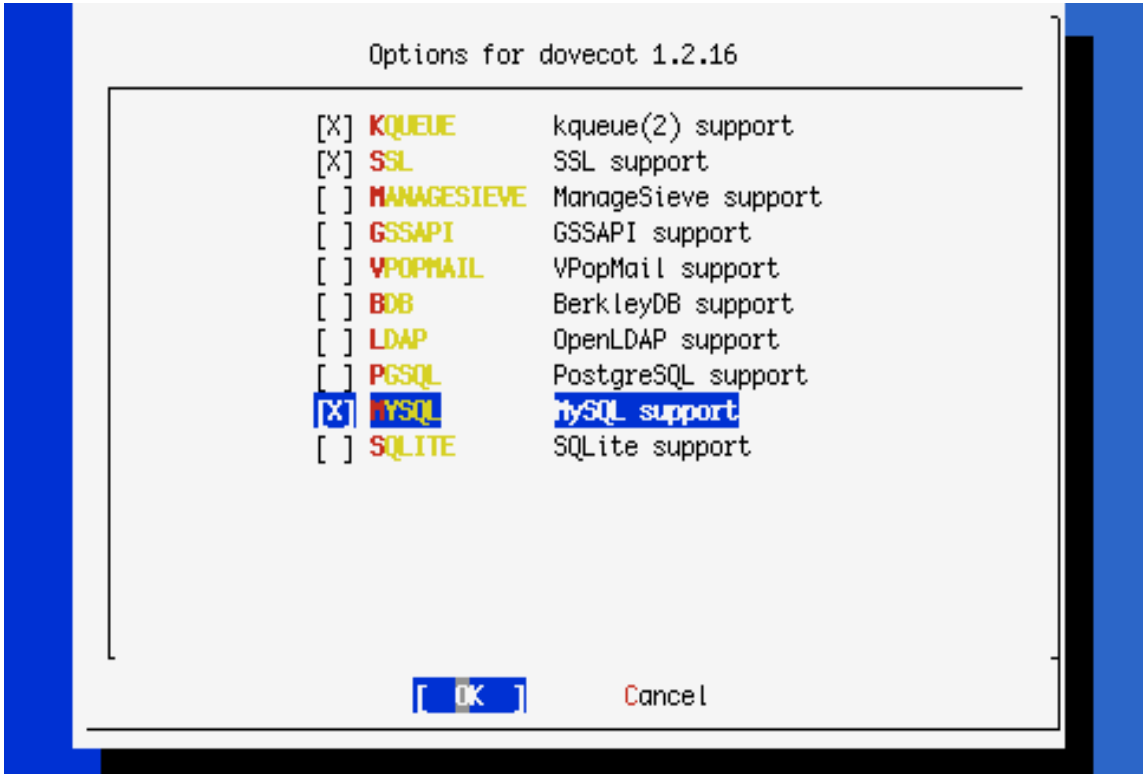
- The mail delivery agent stores all new emails to the mailbox in the tmp directory with a unique filename. (unique = time + hostname+ random generated number)
- The MDA creates a hard link to the file in tmp/ unique to new/unique
- The Mail User Agent will check for new emails in new folder and move them to current folder
- The MUA modifies the filename to add a colon (:), a ‘2’ and various flags to represent message status i.e read, replied, forwarded, deleted, etc
-

What is Dovecot?

- High-performance POP and IMAP server
- Developed byTimo Sirainen
- Unlike say UW IMAP it wasn't written in the 80s
- Transparently index's mailbox contents (Why is this important?)
- Supports both mbox and maildir formats
- Capable of operating in an environment with minimal locking. (Why is this important)
- Graceful around failures (index repair for example)
- Designed with Security in mind – support for Authentication Mechanism and SSL/TLS

Let's install it the FreeBSD way

- `#cd /usr/ports/mail/dovecot`
- `#make install clean`
- Note all the options for databases!
  - It is typical for small applications to do authentication of users using the unix password file or PAM.
  - Big mail installations can use an SQL database interface for the storage of user credentials.
- Select the Mysql Option for this exercise



FreeBSD install cont

- Take a look at `/usr/local/etc/rc.d/dovecot`
- Edit /etc/rc.conf
- dovecot_enable="YES"
- Ok, now we could start it but we really need to configure it first.
- Look at /usr/local/etc/dovecot.conf

Dovecot Configuration

- ***If you do not have a working SSL Certificate, ignore steps above and find the line***
  - *# ssl = yes*
- ***Uncomment the line and modify it to NO***
  - *ssl = no*
- Else if you have SSL Certs Working during Apache Session, find the lines:
  - #ssl_cert_file = /etc/ssl/certs/dovecot.pem
  - #ssl_key_file = /etc/ssl/private/dovecot.pem
- ***Uncomment*** them, and modify the ***PATH*** to point at the certificate and keyfile that we created during the apache tutorial. i.e
  - ssl_cert_file = /usr/local/etc/apache22/server.crt
  - ssl_key_file = /usr/local/etc/apache22/server.key
- Disable plaintext authentication by finding the line below
  - `disable_plaintext_auth = no`
- Set the value to yes as below
  - `disable_plaintext_auth = yes`
  - Note: unencrypted connections can still be made from localhost!

Dovecot Configuration 2

- Note that the default listening services are:
  - `protocols = imap imaps pop3 pop3s managesieve`
  - TCP listeners are on 110 143 993 and 995
  - If you need the unencrypted versions of the protocol for some reason (e.g. a webmail application) then you should firewall them off from the rest of your end users (end-user clients should never be be allowed to connect insecurely)
  - Otherwise disable imap and pop3 ***(optional)***
  - ***If you don't have SSL Certificate (from Apache-SSL session), disable (remove) imaps and pop3s and remain with imap and pop3.***
  - ***Remove "managesieve" option in the protocols section***

Dovecot Configuration – mailbox location

- The mail storage by default on Exim is in /home/%u/mail in Maildir format
- The default Dovecot storage format is set to Mbox and we shall change this format to Maildir.
- To change this to use a different storage format and location
- Locate the line:
  - ***mail_location = mbox:~/mail/:INBOX=/var/mail/%u***
  - `And change it to the following line`
  - ***`mail_location = maildir:~/mail/`***
- Ok we should have a sufficiently tuned dovecot to be able to start it.
- ***`/usr/local/etc/rc.d/dovecot start`***

Done

- If everything works correctly you should be able to point an imap client towards your system at port 993 or pop3 clients on port 110
- Alternatively; using telnet

 # telnet localhost 110

user afnog

pass afnog

list

quit

Scaling Dovecot using Mysql and Virtual Users

Mailbox Location

- Change location of mailbox by editing /usr/local/etc/dovecot.conf
- ***# vi /usr/local/etc/dovecot.conf***
- Locate the line:
- ***`mail_location = maildir:~/mail/`***
- Change it to
- ***mail_location = maildir:/home/vmail/%n/Maildir***

Adding Mysql Authentication

Edit the dovecot config file and make the following changes.

vi /usr/local/etc/dovecot.conf

Find and Comment the following to disable PAM Authentication.

#passdb pam
#args = session=yes dovecot
#}

Uncomment the following line

```
passdb sql {
  args = /usr/local/etc/dovecot-sql.conf
}
```

Comment Static

#userdb passwd {
#args = blocking=yes
#}

Uncomment the following

```
userdb sql {
args = /usr/local/etc/dovecot-sql.conf
}
```

Additional Changes

Add the following values in bold

- *Postmaster_address* = ***valid.email@address***

Uncomment the following

- ***mail_plugin_dir = /usr/local/lib/dovecot/lda***
- ***auth_socket_path = /var/run/dovecot/auth-master***

…cont'd

- The file /usr/local/etc/dovecot-sql.conf does not exist.
- We have created a template for purposes of this class and placed it at /home/afnog/dovecot-sql.conf
- ***#cp /home/afnog/dovecot-sql.conf /usr/local/etc/***
- For more information on the dovecot-sql.conf file please see;
- /usr/local/share/examples/dovecot/dovecot-sql.conf

Creating Dovecot's Mysql DB

- Having configured dovecot to use Mysql, we need to setup create the database in Mysql and populate the database with a user information
- We have provided for a basic sql schema that will be used in this class and placed it at /home/afnog/dovecot-mysql-schema.sql
- Change directory to /home/afnog
- ***#cd /home/afnog***
- Check to see that the file exists in the directory
- ***#ls***
- Run the schema in mysql to create the database
- ***#mysql –p <dovecot-mysql-schema.sql***

…Cont'd

- Edit the file and change the username and password to the Mysql database (*as was created during the Radius setup)*
- *Create a user that will manage the virtual users*
- ***#pw adduser vmail -m***
- check the the UID of the vmail user and take note of it for the next steps
- ***# cat /etc/passwd | grep vmail***

Inserting records in Mysql DB

- The database created by the dovecot-mysql-schema.sql is empty
- To populate data on the mysql database there are two options;
  i) Manually from the mysql CLI
  ii) Using Web/GUI like PHPMyAdmin
- For this class we shall use the mysql CLI to get more hands on experience
- **Replace UID and GID below with the "vmail" UID/GID for example GID is '1002'**
- **xxxx.afnogws.gh** is the domain created in the **DNS class.**

#mysql –p

Mysql> use dovecot;

Mysql> ***insert into users (userid, domain, password, home, uid, gid) values ('afnog', 'xxxx.afnogws.gh', md5('success'), '/home/vmail/%n/Maildir', 'UID', 'GID');***

Mysql> ***insert into users (userid, domain, password, home, uid, gid) values ('yourname', 'xxxx.afnogws.gh', md5('afnog'), '/home/vmail/%n/Maildir', 'UID', 'GID');***

Important Replace UID and GID above with that of vmail user.

Exim Delivery to Virtual Users using Dovecot Delivery

Exim Email Accepting

Open and Edit /usr/local/etc/exim/configure

 # vi /usr/local/etc/exim/configure

Add the Mysql database access config line below primary_hostname

hide mysql_servers = localhost/dovecot/root/afnog

Then change the localuser Router the following lines in the “Routers Section”

dovecot_router:

driver = accept

#local_part_suffix = +*

#local_part_suffix_optional

condition = ${lookup mysql {SELECT home FROM users WHERE userid=‘$local_part’}}

transport = dovecot_delivery

Exim Delivery to Dovecot

Modify the local_delivery with the following lines under the transport section in the configure file.

dovecot_delivery:

driver = pipe

command = /usr/local/libexec/dovecot/deliver

message_prefix =

message_suffix =

delivery_date_add

envelope_to_add

return_path_add

log_output

user = vmail

temp_errors = 64 : 69 : 70 : 71 : 72 : 73 : 74 : 75 : 78

Restart Exim & Dovecot

Restart both Exim and Dovecot

 # /usr/local/etc/rc.d/exim restart

 # /usr/local/etc/rc.d/dovecot restart

Send email tests and watch the logfiles.

Try and log in using the virtual user names and passwords.