Email

CIS 2235 Adv Linux System Administration

Agenda

1. Overview
2. "local" email
3. Getting "local" email remotely
4. Sending/receiving "external" email

These mostly require a demo to learn them

Components of email

- Mail User Agent (MUA) lets users read and compose email. aka email client
- Mail Submission Agent (MSA) accepts email from MUA, submits to MTA
- Mail Transport Agent (MTA) routes messages between machines
- Delivery Agent (DA) places incoming messages into local message store
- Access Agent (AA) optional connects user to message store (IMAP, POP)

Overview

Mail system components

UA = User agent	
MSA = Submission agent	
MTA = Transport agent	
DA = Delivery agent	
AA = Access agent	
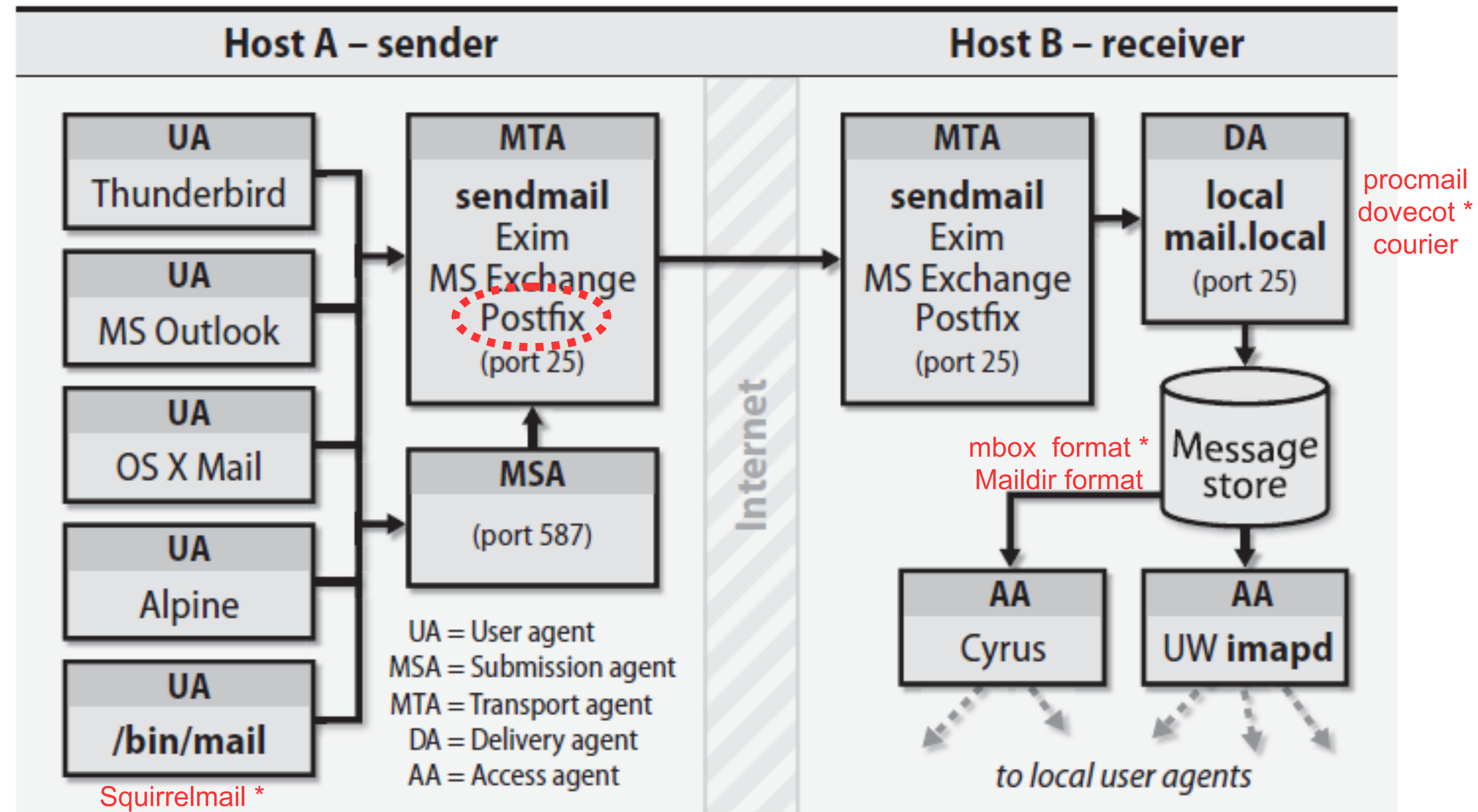
MTAs

`sendmail` was original
`exim` & `postfix` are replacing it over time

MTA	Source	Default MTA on	Market share		
			2017	2009	2001
Exim	exim.org	Debian	56%	30%	8%
Postfix	postfix.org	Red Hat, Ubuntu	33%	20%	2%
Exchange	microsoft.com/exchange	–	1%	20%	4%
sendmail	sendmail.org	FreeBSD	5%	19%	60%
All others	–	–	<3% ea	<3% ea	< 3% ea

Protocol

mail uses port 25 (smtp)
  talk between MTAs

Two major version choices: SMTP vs ESMTP
Errors:
  2xx series status codes indicate success
  4xx series status codes indicate temporary failures
  5xx series status codes indicate permanent failures.

SMTP vs ESMTP

SMTP	ESMTP
Stands for **Simple Mail Transfer Protocol**	Stands for **Extended Simple Mail Transfer Protocol**
First command in SMTP session: HELO techsutram.com	First command in ESMTP session: EHLO techsutram.com
RFC 821	RFC 1869
SMTP 'MAIL FROM' and "RCPT TO' allows size only of 512 characters including <CRLF>.	ESMTP 'MAIL FROM' and "RCPT TO' allows size greater than 512 characters.
SMTP alone cannot be extended with new commands.	ESMTP is framework that enhances capability to extend existing SMTP commands

Protocol

Example session:

```
$ tail -f /var/log/mail.log
$ telnet localhost 25
EHLO <server>
MAIL FROM:<sender>
RCPT TO:<user@localhost>
DATA
QUIT
$ mail
```

Installing postfix

```
$ sudo apt install postfix
```

To configure:
```
$ sudo dpkg-reconfigure postfix
```

postfix configuration

postfix configuration (2)

Postfix architecture
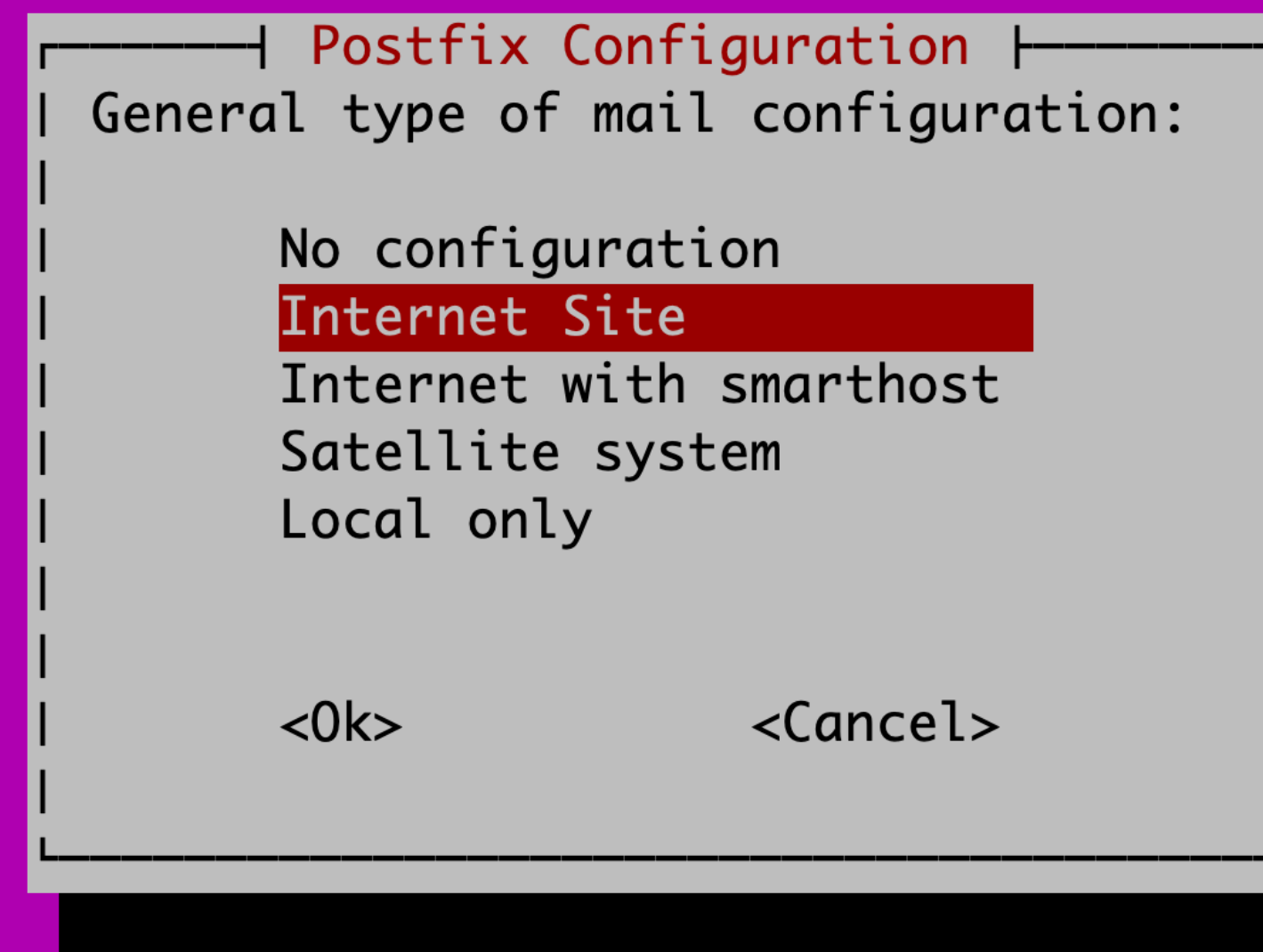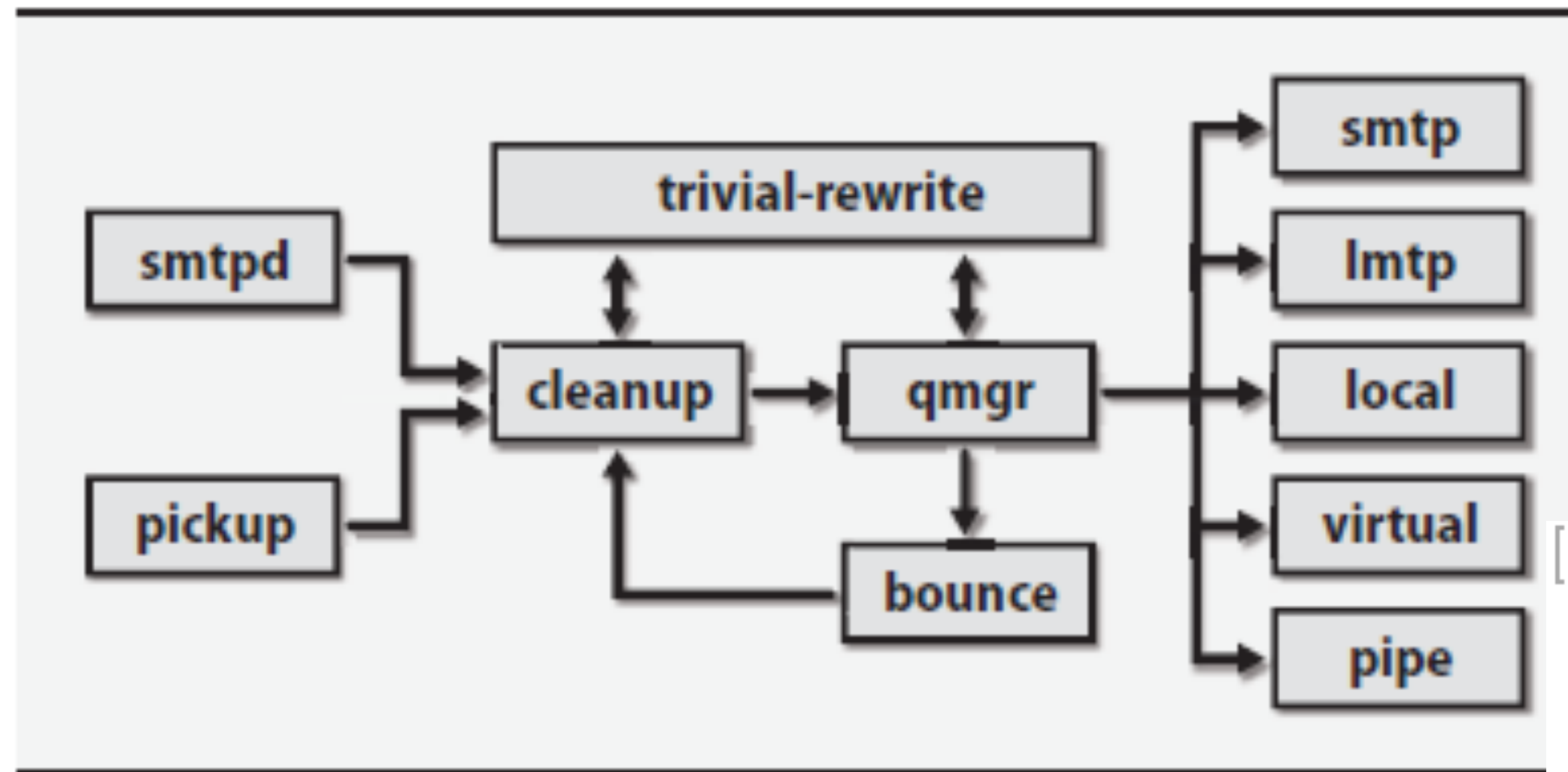
Postfix server programs

You'll see these program names in the mail log: /var/log/mail.log

```
[ldamon@ubuntuLTS:~$ pstree 3679
master──┬──cleanup
        ├──local
        ├──pickup
        ├──proxymap
        ├──qmgr
        ├──smtpd
        ├──tlsmgr
        └──trivial-rewrite
ldamon@ubuntuLTS:~$ █
```

Postfix

Postfix commands and documentation

Several command-line utilities permit user interaction with the mail system:

- **sendmail**, **mailq**, **newaliases** – are **sendmail**-compatible replacements
- **postfix** – starts and stops the mail system (must be run as root)
- **postalias** – builds, modifies, and queries alias tables
- **postcat** – prints the contents of queue files
- **postconf** – displays and edits the main configuration file, **main.cf**
- **postmap** – builds, modifies, or queries lookup tables
- **postsuper** – manages the mail queues

these commands are used to setup and debug.
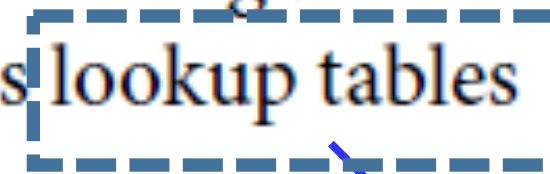
Information sources for Postfix lookup tables

Type	Description
dbm/sdbm	Traditional **dbm** or **gdbm** database file
cidr	Network addresses in CIDR form
hash/btree	Berkeley DB hash table or B-tree file (replaces **dbm**)
ldap	LDAP directory service
mysql	MySQL database
nis	NIS directory service
pcre	Perl-Compatible Regular Expressions
pgsql	PostgreSQL database
proxy	Access through **proxymap**, e.g., to escape a **chroot**
regexp	POSIX regular expressions
static	Returns the value specified as *path* regardless of the key
unix	The **/etc/passwd** and **/etc/group** files; uses NIS syntax[a]

a. unix:passwd.byname is the **passwd** file, and unix:group.byname is the **group** file.

Postfix configure

`/etc/postfix/master.cf`
`/etc/postfix/main.cf`
`$ postconf` for listing or changing `main.cf`
`$ man postconf` for help on the *command* options
`$ man -s 5 postconf` for help on the *file contents*
`$ postconf < -n | -d >`
After you change `main.cf`, *restart* posfix:

`# systemctl restart postfix`
If you need to 'reconfigure':

`$ sudo dpkg-reconfigure postfix`

Key postfix main.cf edits

```
ldamon@ubuntuLTS:~$ postconf -n
alias_database = hash:/etc/aliases
alias_maps = hash:/etc/aliases
append_dot_mydomain = no
biff = no
inet_interfaces = all
inet_protocols = all
mailbox_size_limit = 0
mydestination = $myhostname, ubuntuLTS, localhost.localdomain, , localhost
myhostname = ubuntuLTS.hsd1.vt.comcast.net
mynetworks = 127.0.0.0/8 [::ffff:127.0.0.0]/104 [::1]/128
readme_directory = no
recipient_delimiter = +
relayhost =
smtp_tls_session_cache_database = btree:${data_directory}/smtp_scache
smtpd_banner = $myhostname ESMTP $mail_name (Ubuntu)
smtpd_relay_restrictions = permit_mynetworks permit_sasl_authenticated defer_unauth_destination
smtpd_tls_cert_file = /etc/ssl/certs/ssl-cert-snakeoil.pem
smtpd_tls_key_file = /etc/ssl/private/ssl-cert-snakeoil.key
smtpd_tls_session_cache_database = btree:${data_directory}/smtpd_scache
smtpd_use_tls = yes
```
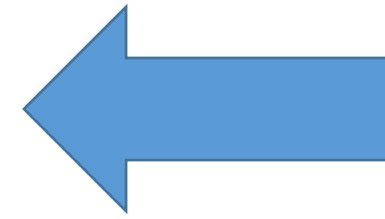
key = value pairs
The default setup is
a pretty good
starting point

Mail store formats (2)

1. `mbox`

    The 'PostOffice' (inbox) is in: `/var/mail/<user>`

    Once read, the mail is stored in default personal folder `~/mbox`

    `$ mail` (no arg) to read PostOffice

    `$ mail -f` to read `~/mbox`

    Both are one big file per user

Mail store formats (2)

2. `Maildir`

    `~<user>/Maildir`

    `cur/, new/, tmp/` sub-dirs

    Each mail is a new file in one of those 3 directories

User Agent - mail

Rather easy to setup mail "locally"

The default UA on linux is mail
```
$ sudo apt install mailutils
```

Send email using
```
$ mail <user>
```

```
[ldamon@ubuntuLTS:~$ mail user02
[Cc:
[Subject: This is a test
[This is only a test.  If this had been a real emergency....
 ldamon@ubuntuLTS:~$
```

receiving local email

```
You have mail.
[user02@ubuntuLTS:~$ mail
"/var/mail/user02": 1 message 1 new
>N    1 Leslie Damon        Sun Apr 15 21:47  13/519    This is a test
[? 1
Return-Path: <ldamon@ubuntuLTS>
X-Original-To: user02@ubuntuLTS
Delivered-To: user02@ubuntuLTS
Received: by ubuntuLTS.hsd1.vt.comcast.net (Postfix, from userid 1014)
        id 2C13C261B9; Sun, 15 Apr 2018 21:47:02 -0400 (EDT)
To: <user02@ubuntuLTS>
Subject: This is a test
X-Mailer: mail (GNU Mailutils 2.99.99)
Message-Id: <20180416014702.2C13C261B9@ubuntuLTS.hsd1.vt.comcast.net>
Date: Sun, 15 Apr 2018 21:47:02 -0400 (EDT)
From: ldamon@ubuntuLTS (Leslie Damon)

This is only a test.  If this had been a real emergency....
?
```

"local" addresses

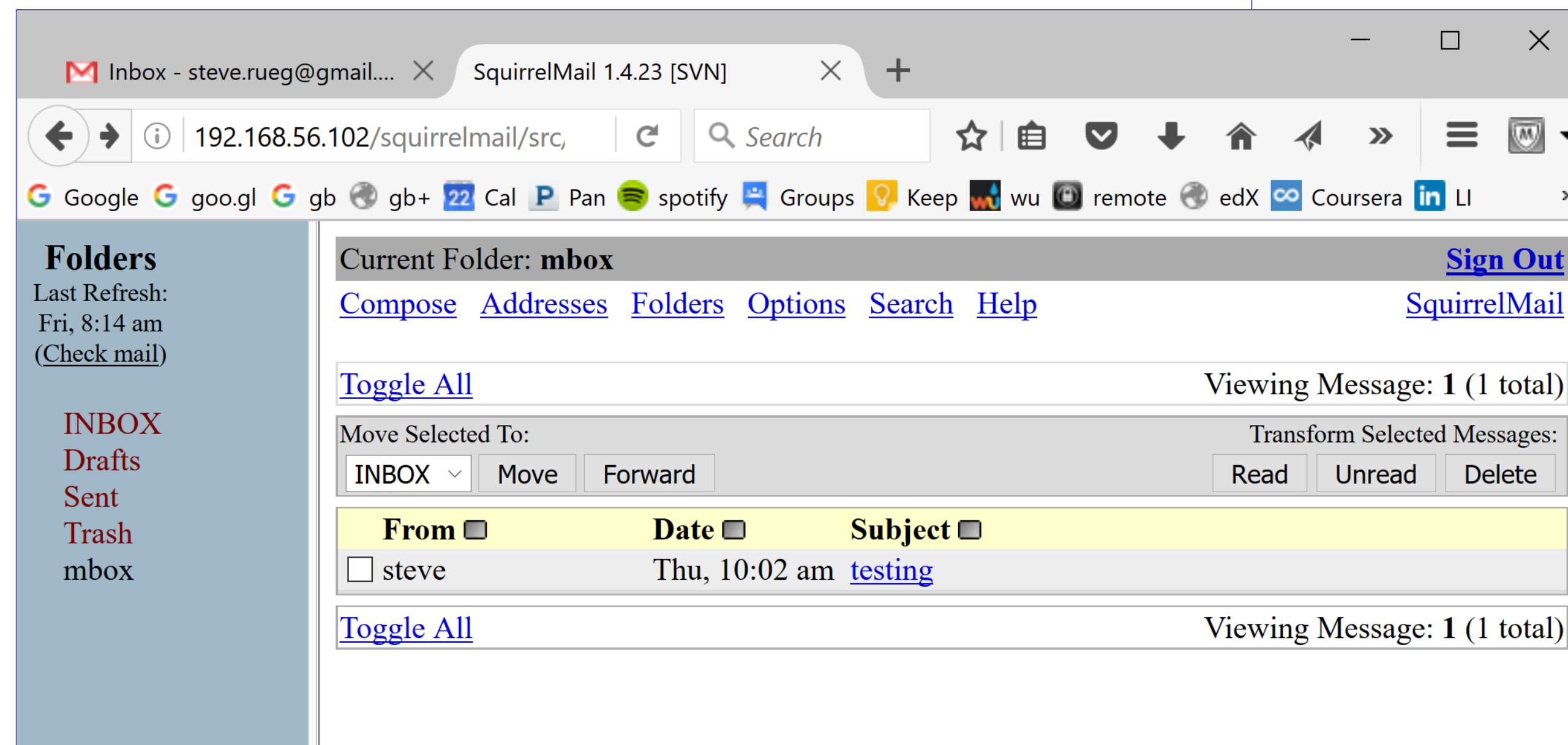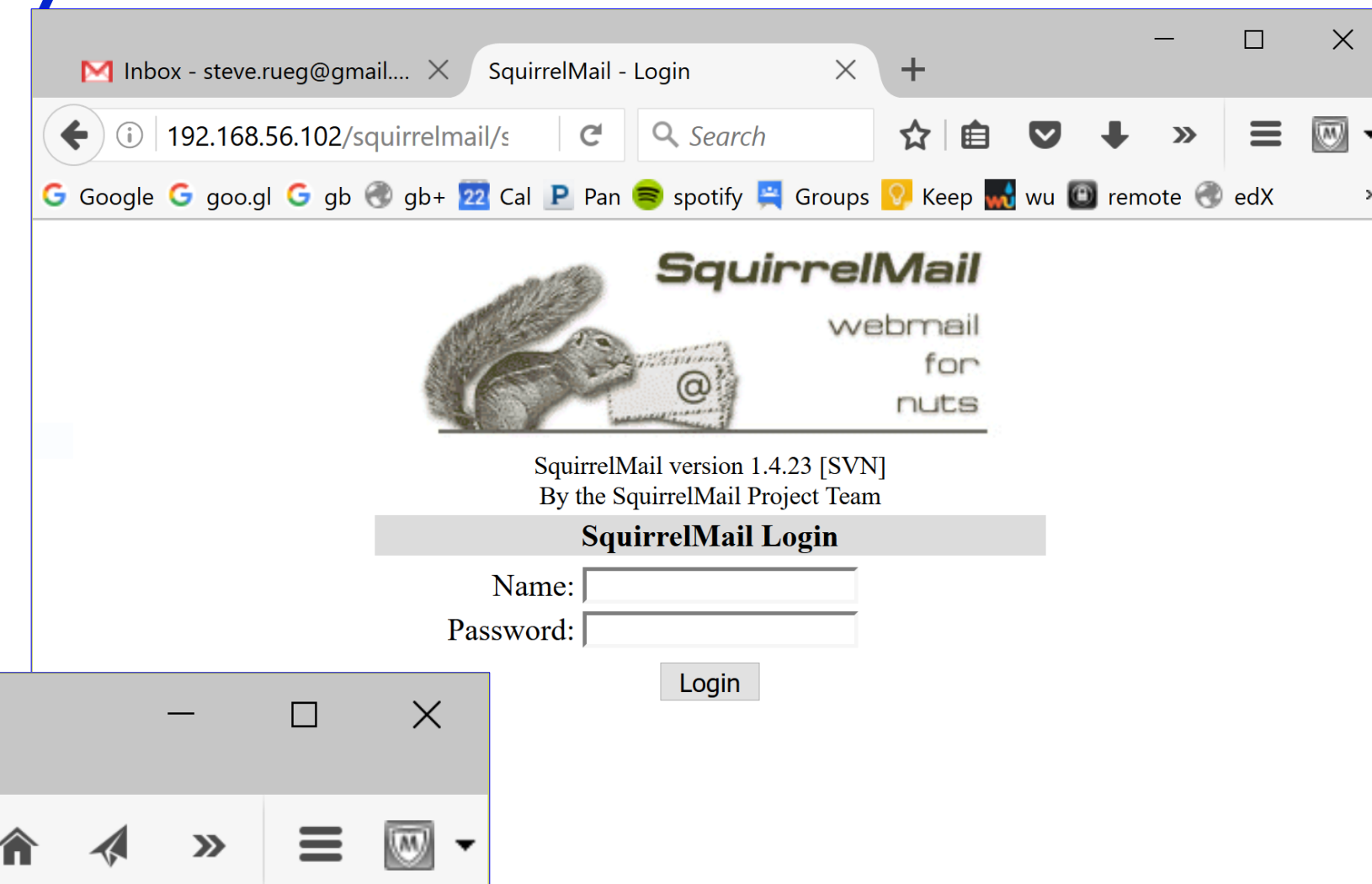# Getting local email remotely

MDA <u>d</u>elivers that 'raw' email to any nice GUI.

2 protocols

 IMAP

 POP3

Setup can be tricky

Sending mail to external users

Can be tricky because of concern about mail bots

Issue: Your local email is a "fantasy" email: what does "ldamon@ubuntuLTS" mean?

Solution: We *map* fantasy email to a real one

Issue: External providers (gmail, yahoo, IBM, VTC) *actively block* emails from 'unsubstantiated' IP addresses – particularly from VM's

Solution: We use a valid *relayhost*

Sending mail to external users

Issue: We don't use plain text for emails, but prefer encryption
Solution: We use TLS encryption

Postfix *external* email setup – in main.cf

1. Fantasy email map (to remove fake email address)

```
smtp_generic_maps = hash:/etc/postfix/generic
```

2. Use a relayhost (to remove fake servername)

```
relayhost = [smtp.office365.com]:587
smtp_sasl_password_maps = hash:/etc/postfix/sasl_passwd
```

3. Use encryption / no anonymous (required):

```
smtp_sasl_security_options = noanonymous
smtp_tls_security_level = encrypt
smtpd_use_tls = yes
```

Short story: relays through an "approved" host, like the vtc office365 server