Email and Postfix

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Actors

MTA
(mail transfer agent)

SMTP →

MTA
(mail transfer agent)

SMTP ↗

MDA
(mail delivery agent)

message store

SMTP ↑

POP/IMAP
server

POP/IMAP ↓

alice

MUA
(mail user agent)

bob

MUA
(mail user agent)
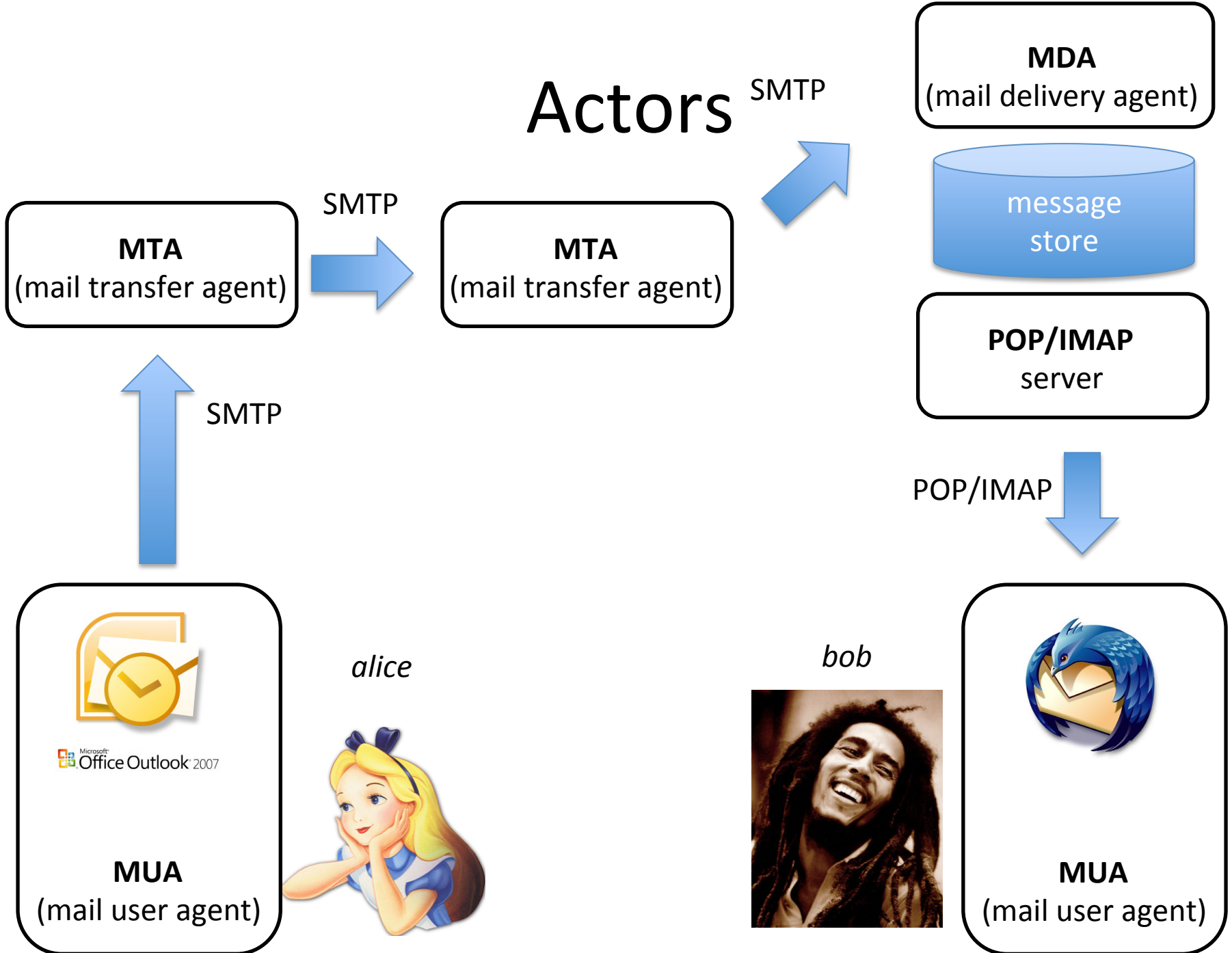
Postfix is a MTA

- other popular MTAs are:
  - sendmail: historical, hard to configure, several security flaws
  - exim: popular
  - Postfix:
    - modular design
    - processes turned with minum priviledges and turned off when not used (e.g. MDA)
    - each process is chrooted and do not use fixed buffers (make buffer overflow unliked to happens)
    - keep DOS controlled (no more than X mem/storage used), rollback if problems

Where to study

- Postfix: the definitive guide (D. Dent - O' really)

- http://www.postfix.org/documentation.html

- RFCs

RCF 2822

- Newer respect to RFC 822
- Define the format for sending email

```
                    guest (ttypa) freebie:~
i:Exit  -:PrevPg  SPC:NextPg  v:Attach  d:Del  r:Reply  j:Next  ?:Help
From grog Sun Apr 12 14:31:02 1998
Date: Sun, 12 Apr 1998 14:31:02 +0930
From: Greg Lehey <grog@lemis.com>
To: Any guest <guest@freebie.lemis.com>
Subject: Comparison
X-Mailer: Mutt 0.91i

FreeBSD  is  a  direct descendent of the    Linux is a clone and never contained any
original UNIX,  though  it  contains  no    AT&T code
residual AT&T code.

FreeBSD is a complete operating  system,    Linux is a kernel, personally maintained
maintained  by  a central group of soft-    by a  Linus  Torvalds.   The  non-kernel
ware  developers.    There  is  only  one    programs supplied with Linux are part of
distribution of FreeBSD.                    a distribution, of which there are  sev-
                                            eral.

FreeBSD  aims  to be a stable production    Linux is still a ``bleeding  edge''  de-
environment.                               velopment  environment, though many dis-
                                           tributions aim to make it more  suitable
                                           for production use.

--- 1/1: Greg Lehey            Comparison                        -- (72%)
```

header

body

SMTP

- Defined in RFC 2821 commands and replies
- Extended with RFC 1869 to ESMTP (client → EHLO and server return list of extension supported)

$ **telnet mail.example.com 25**

Trying 10.232.45.151 Connected to mail.example.com. Escape character is '^]'.

220 mail.example.com ESMTP Postfix

HELO mail.oreilly.com

250 mail.oreilly.com

MAIL FROM:<info@oreilly.com>

250 Ok

RCPT TO:<kdent@example.com>

250 Ok

DATA

354 End data with <CR><LF>.<CR><LF>

Date: Mon, 8 Apr 2003 15:38:21 -0500 From: Customer Service <info@oreilly.com> To: <kdent@example.com> Reply-To: <service@oreilly.com> Message-ID: <01a4e2238200842@mail.oreilly.com> Subject: Have you read RFC 2822?

This is the start of the body of the message. It could continue for many lines, but it doesn't.

.
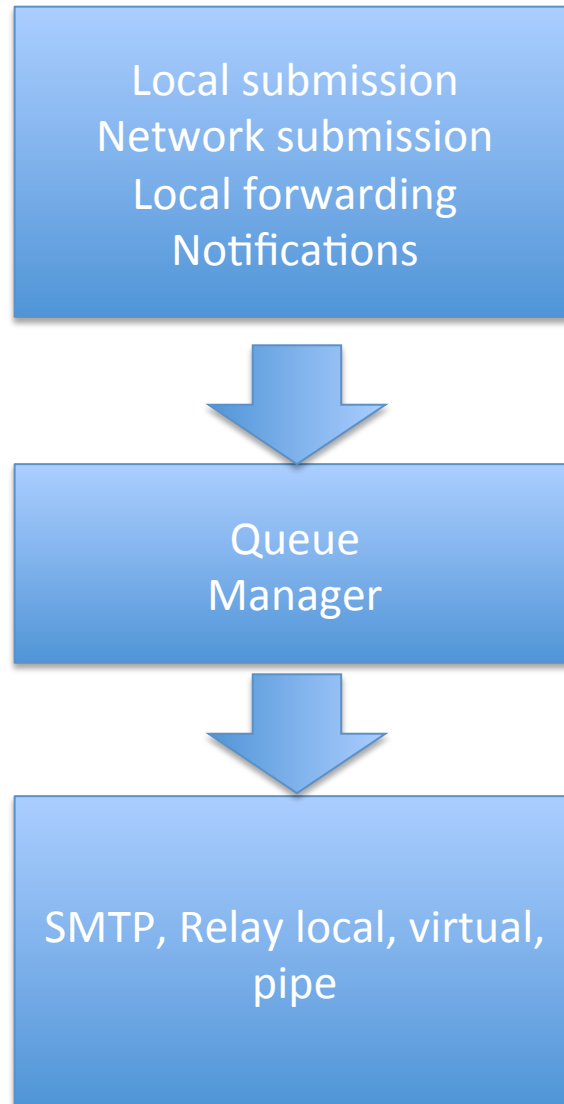
250 Ok: queued as 5FA26B3DFE

quit

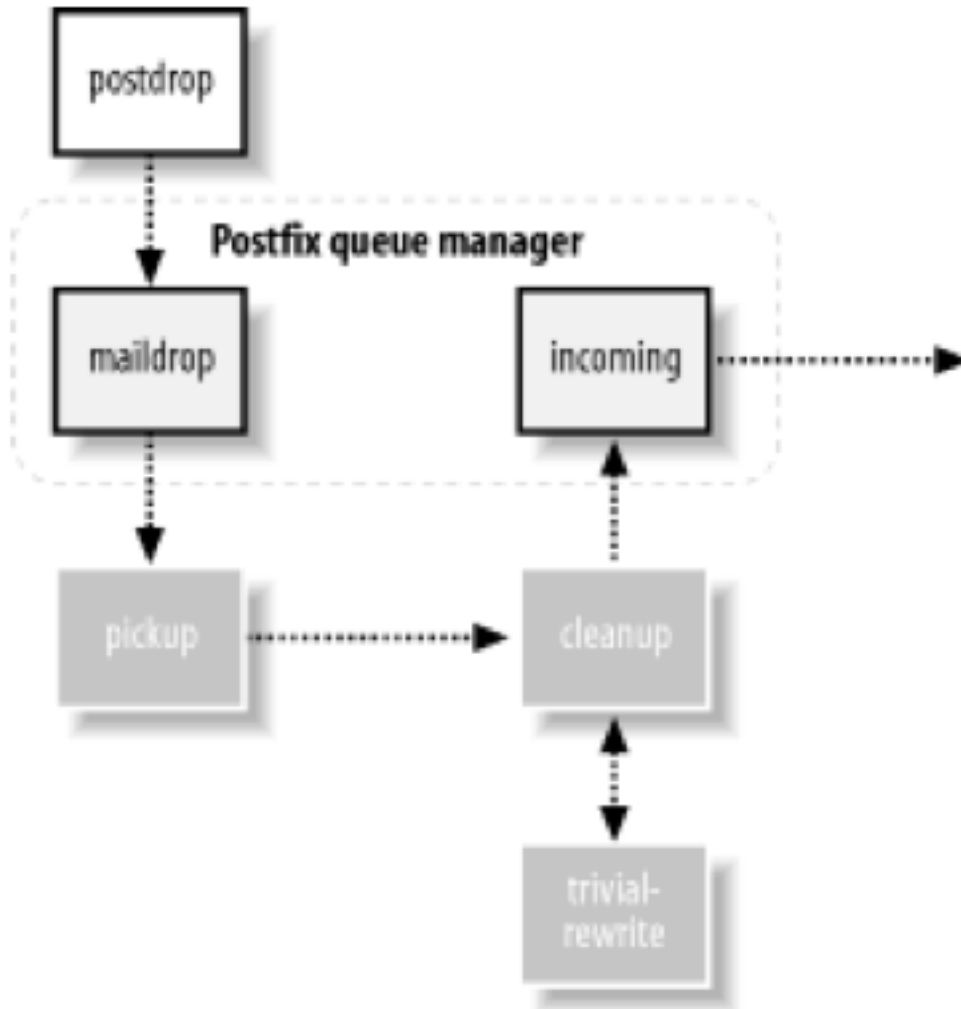221 Bye Connection closed by foreign host.

SMTP Response code

Code level	Status
2xx	The requested action was successful. The client may continue to the next step.
3xx	Command was accepted, but the server expects additional information. The client should send another command with the additional information.
4xx	The command was not successful, but the problem is temporary. The client should retry the action at a later time.
5xx	The command was not successful, and the problem is considered permanent. The client should not retry the action.

Postfix architecture

Local submission
Network submission
Local forwarding
Notifications

Queue
Manager

SMTP, Relay local, virtual, pipe

Local email submission

Postfix notifications

- When a user message is deferred or can't be delivered, Postfix uses the defer or bounce daemons to create a new error message.

- The error message is handed off to the cleanup daemon. It performs its normal checks before depositing the error message into the incoming queue, where it is picked up by the queue manager.

- Email administrator: Postmaster (RFC 2142)
 - In /etc/alias you should find an alias to root

Queue manager

- 4 queue:
- incoming, active, deferred, and corrupt.

Mail delivery - classes

Depending from the "classes", postfix choose the right delivery agent...

- local: users that got shell accounts on that machine (mydestination contains domain names)

  local delivery agent

- virtual alias: changed to real address (according to a table) and forwarded (resubmitted) (virtual_alias_domains, virtual_alias_maps)

  local delivery agent

- virtual mailbox: delivered in mailboxes not associated with users' accounts (virtual_mailbox_domains, virtual_mailbox_maps)

  virtual delivery agent

- relay: e.g. internal network (relay_domains)

  SMTP delivery agent

- lmtp delivery agent: similar to smtp but is for use in the same network / server (e.g. postfix and POP3/imap communication)

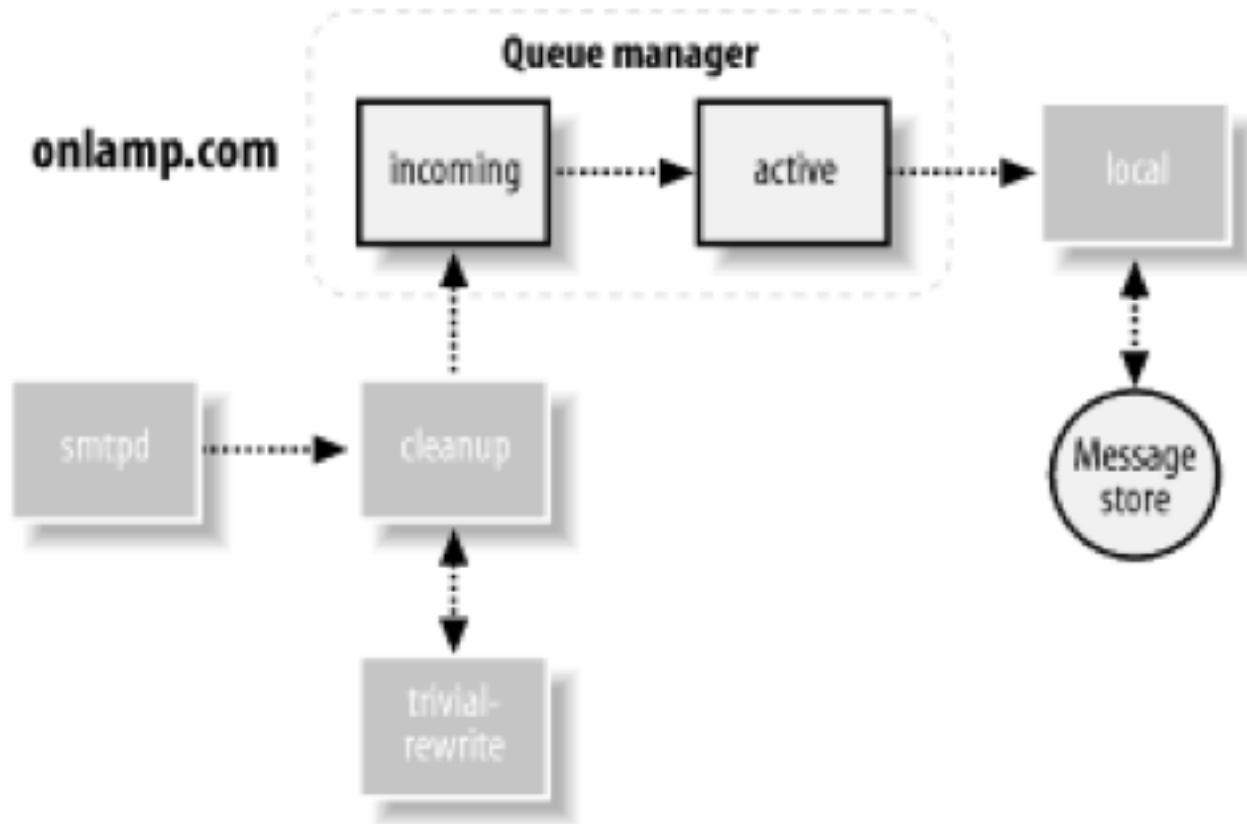- pipe: pass messages to external program (e.g. fax)

Postfix flow (1/3)
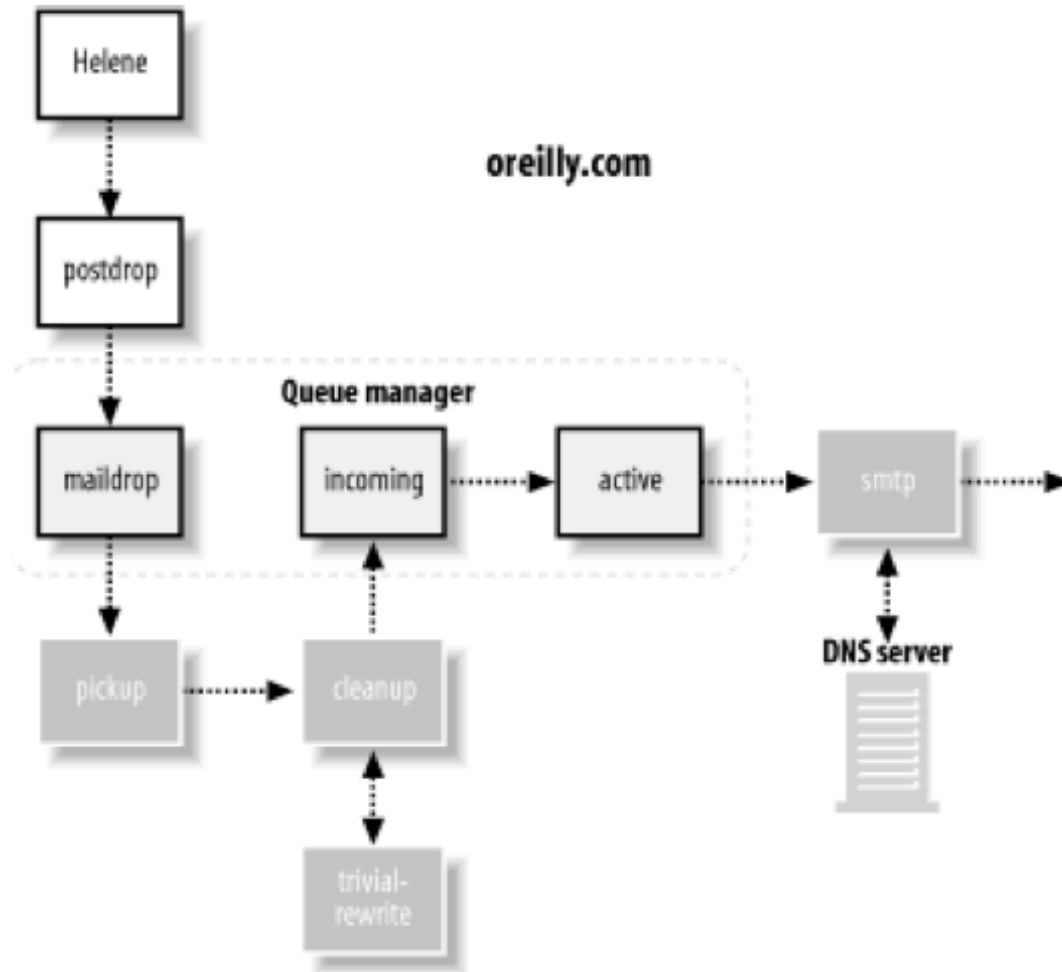
Postfix flow (2/3)
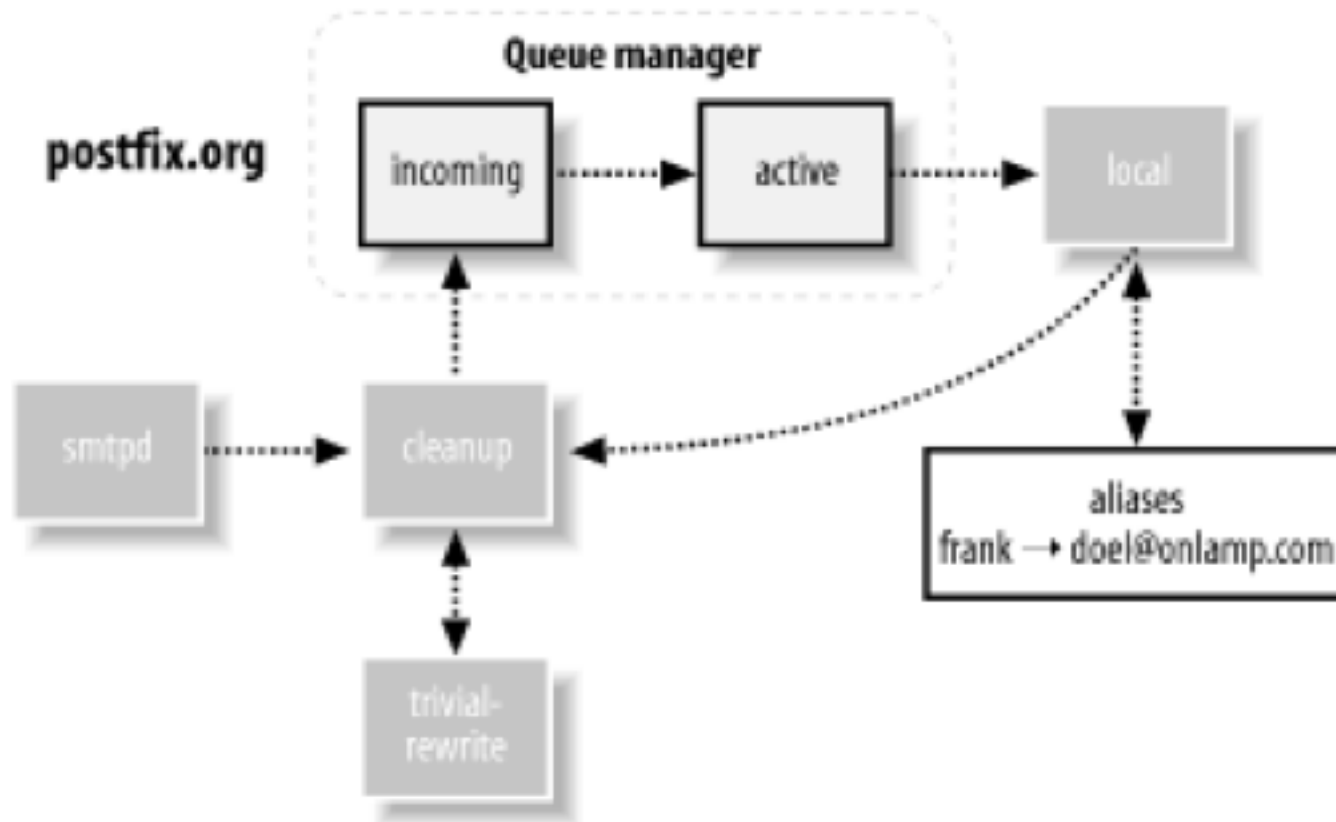
Postfix flow (3/3)

Postfix directories

directory	contains
/etc/postfix	Configuration files and lookup tables
/usr/libexec/postfix	Postfix daemons
/var/spool/postfix	Queue files
/usr/sbin	Postfix commands

Postfix quickstart

- configure your hostname
  - *# postconf -e myhostname=mail.example.com*
- construct your aliases database
  - *newaliases*
- start postfix
  - *postfix start #(or reload, stop etc)*

- *That's it!*

Send/Rcv email from script

- Using the "mail" command:
  - mail -s "Hello world" you@youremailid.com
  - # echo "This will go into the body of the mail." | mail -s "Hello world" you@youremailid.com
- For the attachments:
  - # echo "Sending an attachment." | mutt -a backup.zip -s "attachment" calvin@cnb.com
- View the email

```
pippo@server1:/root$ mail
Mail version 8.1.2 01/15/2001.  Type ? for help.
"/var/mail/pippo": 1 message 1 new
>N  1 root@cgrl.edu       Thu May 24 20:56   15/411    prova1
& P
Message 1:
From root@cgrl.edu  Thu May 24 20:56:13 2012
X-Original-To: pippo@cgrl.edu
To: pippo@cgrl.edu
Subject: prova1
Date: Thu, 24 May 2012 20:56:13 +0000 (UTC)
From: root@cgrl.edu (root)

ciao
ciao
```

Message store format: mbox

- **historical in UNIX**
  - just one file: /home/pippo/mbox
  - postfix use locking to avoid to read/write while pop/imap do(postconf –l)


```
From root@cgrl.edu   Thu May 24 20:56:13 2012
Return-Path: <root@cgrl.edu>
X-Original-To: pippo@cgrl.edu
Delivered-To: pippo@cgrl.edu
Received: by mail.cgrl.edu (Postfix, from userid 0)
        id 1CC951144D; Thu, 24 May 2012 20:56:13 +0000 (UTC)
To: pippo@cgrl.edu
Subject: prova1
Message-Id: <20120524205613.1CC951144D@mail.cgrl.edu>
Date: Thu, 24 May 2012 20:56:13 +0000 (UTC)
From: root@cgrl.edu (root)
Status: RO

ciao
ciao
```

- maildir format exists as well (solve some problems when system crash)
- mail_spool_directory = /var/spool/mail/
- home_mailbox = mbox   OR maildir/

Procmail

- procmail is a mail delivery agent (MDA) capable of sorting incoming mail into various directories and filtering out spam messages.
- Procmail is widely used on Unix-based systems and stable, but no longer maintained;
- maildrop is mantained instead

POP vs IMAP

- POP: download all whole messages (good for intermittently connected devices). Options to delete messages on server

- IMAP: possibility to download whole messages, just the header, delete selectively messages (work remotely on the server)

postfix

message store

pop/imap

LMTP

- Problem: what if POP/IMAP server got their own message store format?
  - Different programs need a standard way to communicate…
  - LMTP: simplified version of SMTP for LAN, cluster and intra machine communication
  - basically just OK or KO (no responsibility!)

- mailbox_transport: see aliases and entries and pass to LMTP client
- local_transport: just pass to LMTP client
- fallback_transport: if not local, then pass to LMTP client

.forward

- file in user directory (create by user)
- name is defined in forward_path directive
- in the simplest case a /home/pippo/.forward with
  - pippo2@cgrl.edu
- will be forwarder to that user