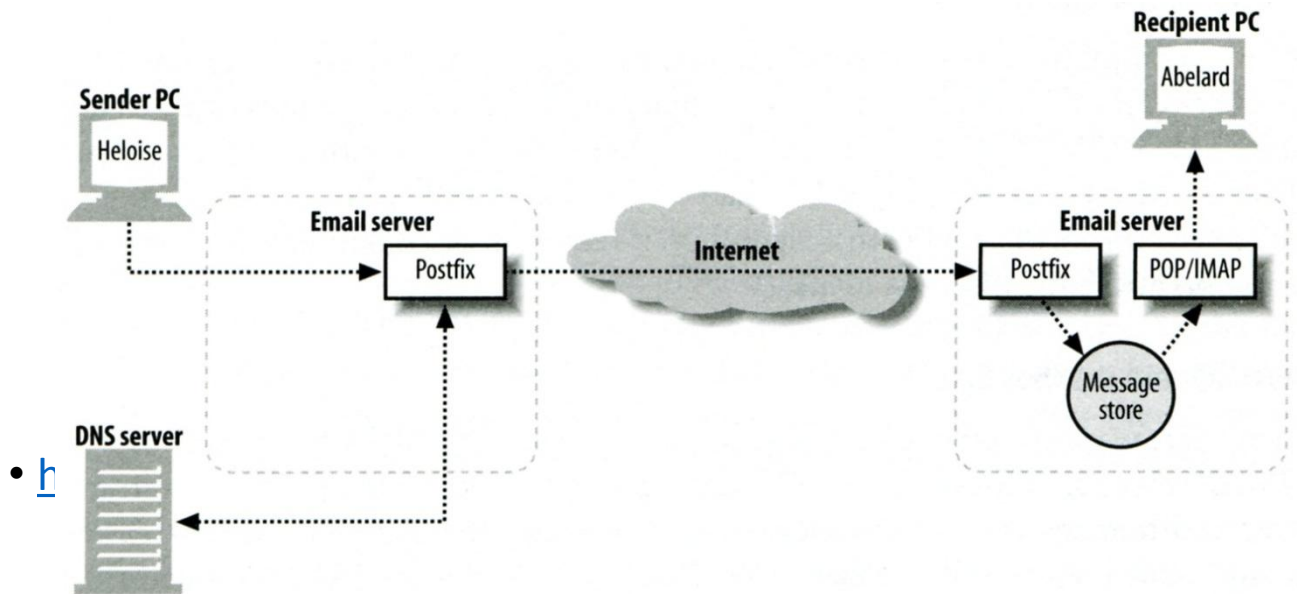


Postfix

# Role of Postfix

- MTA that
  - Receive and deliver email over the network via SMTP
  - Local delivery directly or use other mail delivery agent



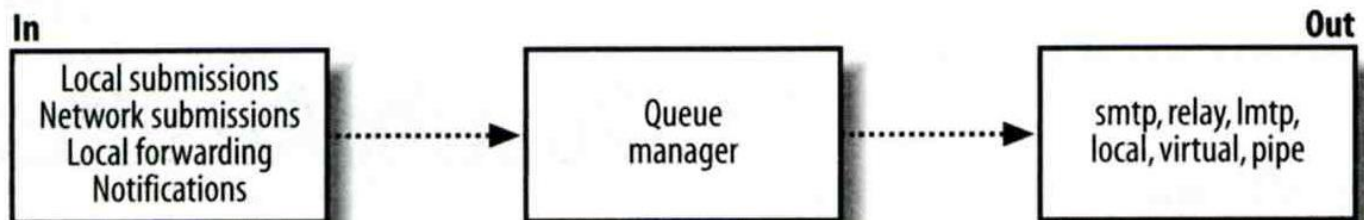
# Postfix Architecture

## ❑ Modular-design MTA

- Not like sendmail of monolithic system
- Decompose into several individual program that each one handle specific task
- The most important daemon: `master` daemon
  - Reside in memory
  - Get configuration information from `master.cf` and `main.cf`
  - Invoke other process to do jobs

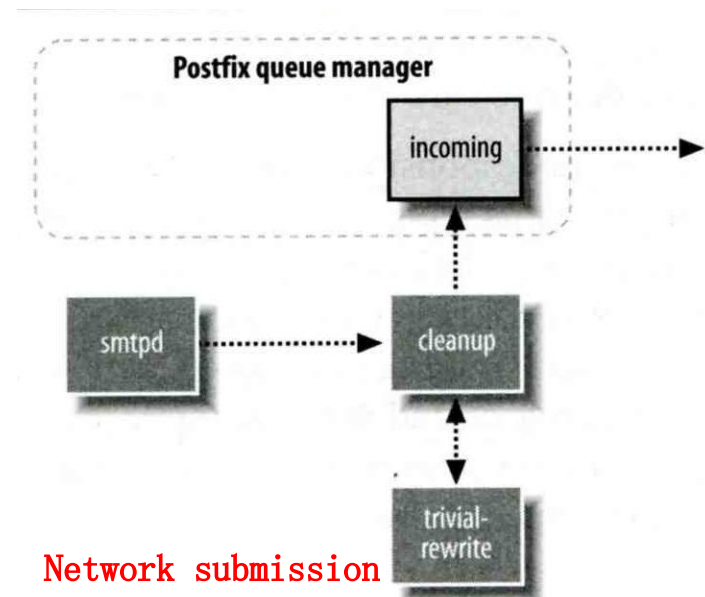
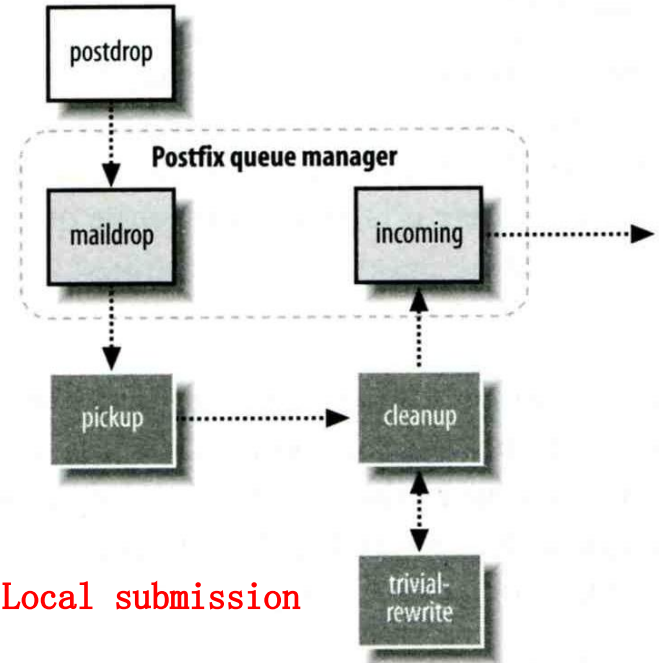
## ❑ Major tasks

- Receive mail and put in **queue**
- Queue management
- Delivery mail from queue



# Postfix Architecture – Message IN

- Four ways
  - Local submission
    - postdrop command
    - maildrop queue
    - pickup daemon
    - cleanup daemon
      - Header validation
      - address translation
    - incoming queue
  - Network submission
    - smtpd daemon
  - Local forwarding
    - Resubmit for such as .forward
    - Envelope “to” is changed
  - Notification



# Postfix Architecture – Queue

- Five different queues
  - incoming
    - The first queue that every incoming email will stay
  - active
    - Queue manager will move message into active queue whenever there is enough system resources
    - Queue manager then invokes suitable DA to delivery it
  - deferred
    - Messages that cannot be delivered are moved here
    - These messages are sent back either with bounce or defer daemons
  - corrupt
    - Used to store damaged or unreadable message
  - hold

# Postfix Architecture – Message OUT – Part I

- Address classes
  - Used to determine which destinations to accept for delivery
  - How the delivery take place
- Main address classes
  - Local delivery
    - Domain names in “mydestination” is local delivered
    - Ex:
      - mydestination = nasa.cs.nctu.edu.tw localhost
    - It will check alias and .forward file to do further delivery
  - Relay
    - Transfer mail for others to not your domain
    - It is common for centralize mail architecture to relay trusted domain
  - Deliver mail to other domains for authorized user
    - The queue manager will invoke the smtp DA to deliver this mail
- Virtual alias
- Virtual mailbox

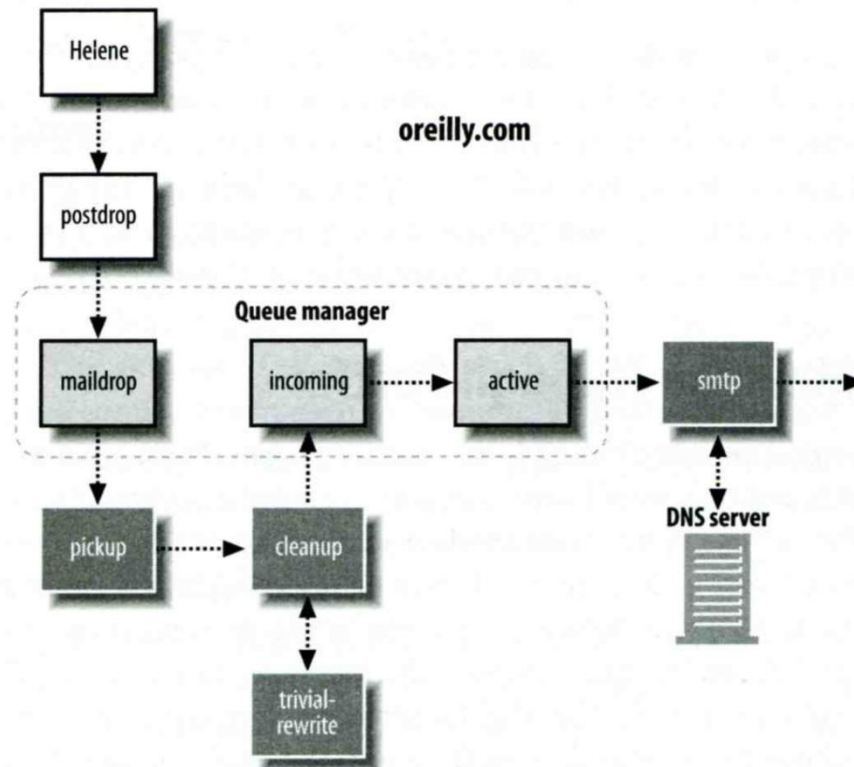
# Message Flow in Postfix (1)

- Example

- helene@oreilly.com → frank@postfix.org (doel@onlamp.com)

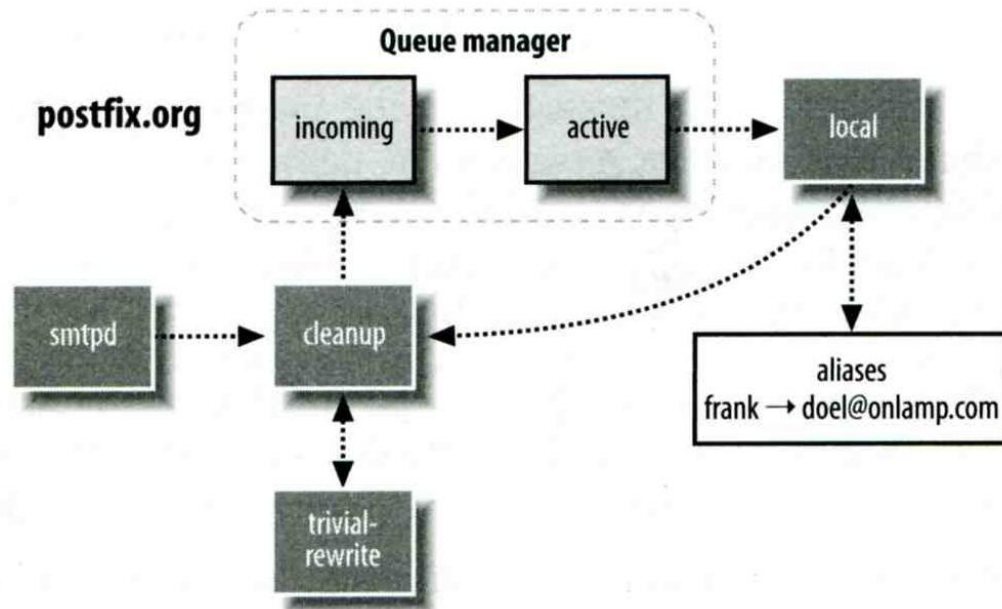
- Phase1:

- Helene compose mail using her MUA, and then call postfix's sendmail command to send it



# Message Flow in Postfix (2)

- Example
  - frank@postfix.org → doel@onlamp.com
  - Phase2:
    - The smtpd on postfix.org takes this message and invoke cleanup then put in incoming queue
    - The local DA find that frank is an alias, so it resubmits it through cleanup daemon for further delivery





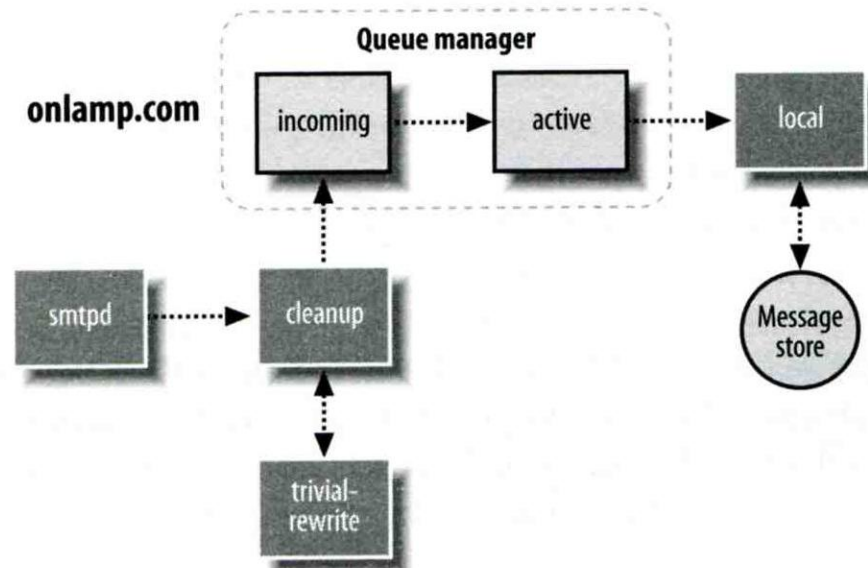
# Message Flow in Postfix (3)

- Example

- frank@postfix.org → doel@onlamp.com

- Phase3

- The smtpd on onlamp.com takes this message and invoke cleanup then put in incoming queue
    - Local delivery to message store



# Message Store Format

## ❑ The Mbox format

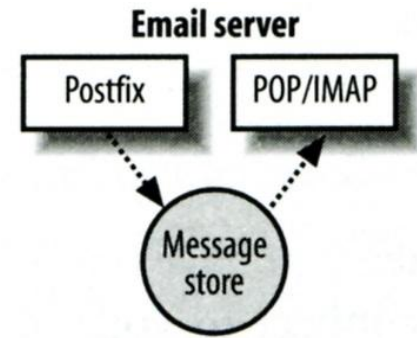
- Store messages in **single file** for each user
- Each message start with “**From** ” line and continued with message headers and body
- Mbox format has **file-locking** problem

## ❑ The Maildir format

- Use **structure of directories** to store email messages
- Each message is in its owned file
- Three subdirectories - cur, new, and tmp
- Maildir format has **scalability** problem
  - locate and delete mails quickly, but waste amounts of fd, inodes, space
  - Problems of quota and backup

## ❑ Related parameters (in main.cf)

- mail\_spool\_directory = /var/mail (Mbox)
- mail\_spool\_directory = /var/mail/ (Maildir)



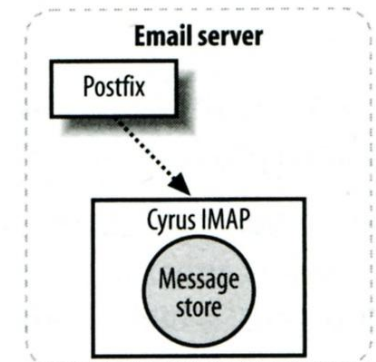
# Postfix & POP3/IMAP

## ❑ POP3 vs. IMAP

- Both are used to retrieve mail from server for remote clients
- POP3 has to download entire message, while IMAP can download headers only
- POP3 can download only single mailbox, while IMAP can let you maintain multiple mailboxes and folders on server

## ❑ Postfix works together with POP3/IMAP

- Postfix and POP3/IMAP must agree on the type of **mailbox format** and style of **locking**
  - Standard message store
  - Non-standard message store (using LMTP)
    - Such as Cyrus IMAP or Dovecot



# Postfix Configuration

- Two most important configuration files
  - /usr/local/etc/postfix/main.cf – postconf(5)
    - Core configuration
  - /usr/local/etc/postfix/master.cf – master(5)
    - Which postfix service should invoke which program
- Edit main.cf
  - Using text editor
  - postconf
    - % postconf [-e] "myhostname = nasa.cs.nctu.edu.tw"
    - % postconf -d myhostname (print default setting)
    - % postconf myhostname (print current setting)
- Reload postfix whenever there is a change
  - # postfix reload

# Postfix Configuration – Lookup tables (1)

- Parameters that use external files to store values
  - Such as mydestination, mynetwork, relay\_domains
  - Text-based table is ok, but time-consuming when table is large
- Lookup tables syntax
  - Key values
- Database format
  - `% postconf -m`
    - List all available database format
  - In main.cf
    - `default_database_type`

```
% postconf default_database_type  
default_database_type = hash  
• h % postconf -h default_database_type  
hash
```

```
% postconf -m  
btree  
cidr  
environ  
hash  
internal  
proxy  
regexp  
static  
tcp  
texthash  
unix
```

# Postfix Configuration – Lookup tables (2)

- Use databased-lookup table in main.cf
  - syntax  
parameter = type:name
  - Ex:
    - In main.cf  
canonical\_maps = hash:/usr/local/etc/postfix/canonical
    - After execute postmap  
/usr/local/etc/postfix/canonical.db
- postmap command
  - Generate database
    - # postmap hash:/usr/local/etc/postfix/canonical
  - Query
    - % postmap -q nctu.edu.tw hash:/usr/local/etc/postfix/canonical

# Postfix Configuration – Lookup tables (3)

- Regular expression tables
  - More flexible for matching keys in lookup tables
    - Sometimes you cannot list all the possibilities
  - Two regular expression libraries used in Postfix
    - POSIX extended regular expression (regexp, default)
    - Perl-Compatible regular expression (PCRE)
  - Usage
    - /pattern/ value
    - Do some content checks, such as
      - header\_checks
      - body\_checks
    - Design some features
      - /(\S+)\.(\S+)@nasa\.cs\.nctu\.edu\.tw/ \$1@nasa.cs.nctu.edu.tw

# Postfix Configuration – Categories

- Categories
  - Server identities
    - my...
  - Mail rewriting
    - for incoming/outgoing mails
  - Access control
    - restrictions
  - Mail processing
    - filter
  - Operation details
    - ...



# Postfix Configuration – MTA Identity

- Four related parameters
  - myhostname
    - myhostname = nasa.cs.nctu.edu.tw
    - If un-specified, postfix will use 'hostname' command
  - mydestination
    - List all the domains that postfix should accept for local delivery
    - mydestination = \$myhostname, localhost.\$mydomain \$mydomain
      - This is the CS situation that mx will route mail to mailgate
    - mydestination = \$myhostname www.\$mydomain, ftp.\$mydomain
  - mydomain
    - mydomain = cs.nctu.edu.tw
    - If un-specified, postfix use myhostname minus the first component
  - myorigin
    - myorigin = \$mydomain (default is \$myhostname)

# Postfix Configuration – System-wide aliases files

- ❑ Using aliases in Postfix ([first-matching](#))
  - alias\_maps = hash:/etc/aliases
  - alias\_maps = hash:/etc/aliases, nis:mail.aliases
  - alias\_database = hash:/etc/aliases
    - Tell newaliases command which aliases file to build
- ❑ To Build alias database file
  - % postalias /etc/aliases
- ❑ Alias file format (same as sendmail)
  - RHS can be
    - Email address, filename, |command, :include:
- ❑ Alias restriction
  - allow\_mail\_to\_commands = alias, forward
  - allow\_mail\_to\_files = alias, forward

# Postfix Configuration – Virtual Alias Maps

## □ Virtual Alias Map

- It **recursively** **rewrites envelope recipient** addresses for all local, all virtual, and all remote mail destinations.
- `virtual_alias_domains` = `$virtual_alias_maps` (default)
- `virtual_alias_maps` = `hash:/usr/local/etc/postfix/virtual`
  - | src-address                          | dst-address                        |
|--------------------------------------|------------------------------------|
| <code>chwong@csie.nctu.edu.tw</code> | <code>@chbsd.cs.nctu.edu.tw</code> |
| <code>chwong</code>                  | <code>ch0nsi@gmai1.com</code>      |
| <code>@csie.nctu.edu.tw</code>       | <code>@cs.nctu.edu.tw</code>       |
- Applying regular expression
  - `virtual_alias_maps` = `pcre:/usr/local/etc/postfix/virtual`

<code>/^root(\..+)?@(t)?(cs np)?bsd\d*\.\cs\.\nctu\.\edu\.\tw\$/</code>	<code>bsdta@cs.nctu.edu.tw</code>
<code>/^root(\..+)?@(t)?(cs np)?linux\d*\.\cs\.\nctu\.\edu\.\tw\$/</code>	<code>linuxta@cs.nctu.edu.tw</code>
<code>/^root(\..+)?@(t)?csmail\w*\d*\.\cs\.\nctu\.\edu\.\tw\$/</code>	<code>mailta@cs.nctu.edu.tw</code>

# Postfix Configuration – Relay Control (1)

- Open relay
  - A mail server that permit anyone to relay mails
  - By default, postfix is not an open relay
  
- A mail server should
  - Relay mail for trusted user
    - Such as `liuyh@smtp.cs.nctu.edu.tw`
  - Relay mail for trusted domain
    - Ex. `smtp.cs.nctu.edu.tw` trusts `nctu.edu.tw`

# Postfix Configuration – Relay Control (2)

## ❑ Restricting relay access by mynetworks\_style

- mynetworks\_style = subnet
  - Allow relaying from other hosts in the same **subnet**, configured in this machine
- mynetworks\_style = host
  - Allow relaying for only local machine
- mynetworks\_style = class
  - Any host in the same class A, B or C

## ❑ Restricting relay access by mynetworks (override mynetworks\_style)

- List individual IP or subnets in network/netmask notation
- Ex: in /usr/local/etc/postfix/mynetworks
  - 127.0.0.0/8
  - 140.113.0.0/16
  - 10.113.0.0/16

## ❑ Relay depends on the type of your mail server

- smtp.cs.nctu.edu.tw will be different from csmx1.cs.nctu.edu.tw

# Postfix Configuration – Receiving limits

- Enforce limits on incoming mail
  - The number of recipients for single delivery
    - `smtpd_recipient_limit = 1000`
  - Message size
    - `message_size_limit = 10240000`

# Postfix Configuration – Rewriting address (1)

## ❑ For unqualified address

- To append “myorigin” to local name.
  - `append_at_myorigin = yes`
- To append “mydomain” to address that contain only host.
  - `append_dot_mydomain = yes`

## ❑ Masquerading hostname

- Hide the names of internal hosts to make all addresses appear as if they come from the same mail server
- It is often used in out-going mail gateway
  - `masquerade_domains = cs.nctu.edu.tw`
  - `masquerade_domains = !chairman.cs.nctu.edu.tw cs.nctu.edu.tw`
  - `masquerade_exceptions = admin, root`
- Rewrite to all envelope and header address **excepts** [envelope recipient](#) address
  - `masquerade_class = envelope_sender, header_sender, header_recipient`

# Postfix Configuration – Rewriting address (2)

- Canonical address – canonical(5)
  - Rewrite both **header** and **envelope** recursively invoked by **cleanup** daemon
  - In main.cf
    - canonical\_maps = hash:/usr/local/etc/postfix/canonical
    - canonical\_classes = envelope\_sender, envelope\_recipient, header\_sender, header\_recipient
  - In canonical

```
/^(.*)@(t)?(cs)?(bsd|linux|sun)\d*\.\cs\.\nctu\.\edu\.\tw$/ $1@cs.nctu.edu.tw
```
- Similar configurations
  - sender\_canonical\_maps、sender\_canonical\_classes
  - recipient\_canonical\_maps、recipient\_canonical\_classes



# Postfix Configuration – Rewriting address (3)

- Relocated users

- Used to inform sender that the recipient is moved
- In main.cf
  - `relocated_maps = hash:/usr/local/etc/postfix/relocated`

- In relocated

```
andy@nasa.cs.nctu.edu.tw      andyliu@abc.com  
liuyh                        EC319, NCTU, ROC  
@nabsd.cs.nctu.edu.tw      zfs.cs.nctu.edu.tw
```

- Unknown users

- Not local user and not found in maps
- Default action: reject

# Postfix Configuration – master.cf (1)

- /usr/local/etc/postfix/master.cf
  - Define services that **master** daemon can invoke
  - Each row defines a service and
  - Each column contains a specific configuration option

```
# =====  
# service type private unpriv chroot wakeup maxproc command + args  
# (yes) (yes) (yes) (never) (100)  
# =====  
smtp inet n - n - - smtpd  
pickup fifo n - n 60 1 pickup  
cleanup unix n - n - 0 cleanup  
rewrite unix - - n - - trivial-rewrite  
smtp unix - - n - - smtp  
local unix - n n - - local  
virtual unix - n n - - virtual  
relay unix - - n - - smtp  
-o smtp_fallback_relay=  
lmtpl unix - - n - - lmtpl  
maildrop unix - n n - - pipe  
 flags=DRhu user=vmail argv=/usr/local/bin/maildrop -d ${recipient}
```

# Postfix Configuration – master.cf (2)

- Configuration options
  - Service name
  - Service type
    - inet, unix, fifo, or pass
  - Private
    - Access to this component is restricted to the Postfix system
      - inet cannot be private
  - Unprivileged
    - Run with the least amount of privilege required
      - y will run with the account defined in “mail\_owner”
      - n will run with root privilege
        - local, pipe, spawn, and virtual

# Postfix Configuration – master.cf (3)

- Configuration options
  - Chroot
    - chroot location is defined in “queue\_directory”
  - Wake up time
    - Automatically wake up the service after the number of seconds
  - Process limit
    - Number of processes that can be executed simultaneously
    - Default count is defined in “default\_process\_limit”
  - command + args
    - Default path is defined in “daemon\_directory”
      - /usr/libexec/postfix

# Postfix Architecture – Message OUT – Part II

- Local delivery
- Relay to the destinations
- Other delivery agent (MDA)
  - Specify in `/usr/local/etc/postfix/master.cf`
    - How a client program connects to a service and what daemon program runs when a service is requested
  - Imtp
    - Local Mail Transfer Protocol (Limited SMTP)
      - No queue
      - One recipient at once
    - Used to deliver to mail systems on the same network or even the same host
  - pipe
    - Used to deliver message to external program

# Mail Relaying – Transport Maps (1)

## ❑ Transport maps – transport(5)

- It **override default** transport method to deliver messages
- In main.cf
  - `transport_maps = hash:/usr/local/etc/postfix/transport`
- In transport file
  - `domain_or_address transport:nexthop`

<code>csie.nctu.edu.tw</code>	<code>smtp:[mailgate.csie.nctu.edu.tw]</code>
<code>cs.nctu.edu.tw</code>	<code>smtp:[csmailgate.cs.nctu.edu.tw]</code>
<code>cis.nctu.edu.tw</code>	<code>smtp:[mail.cis.nctu.edu.tw]</code>

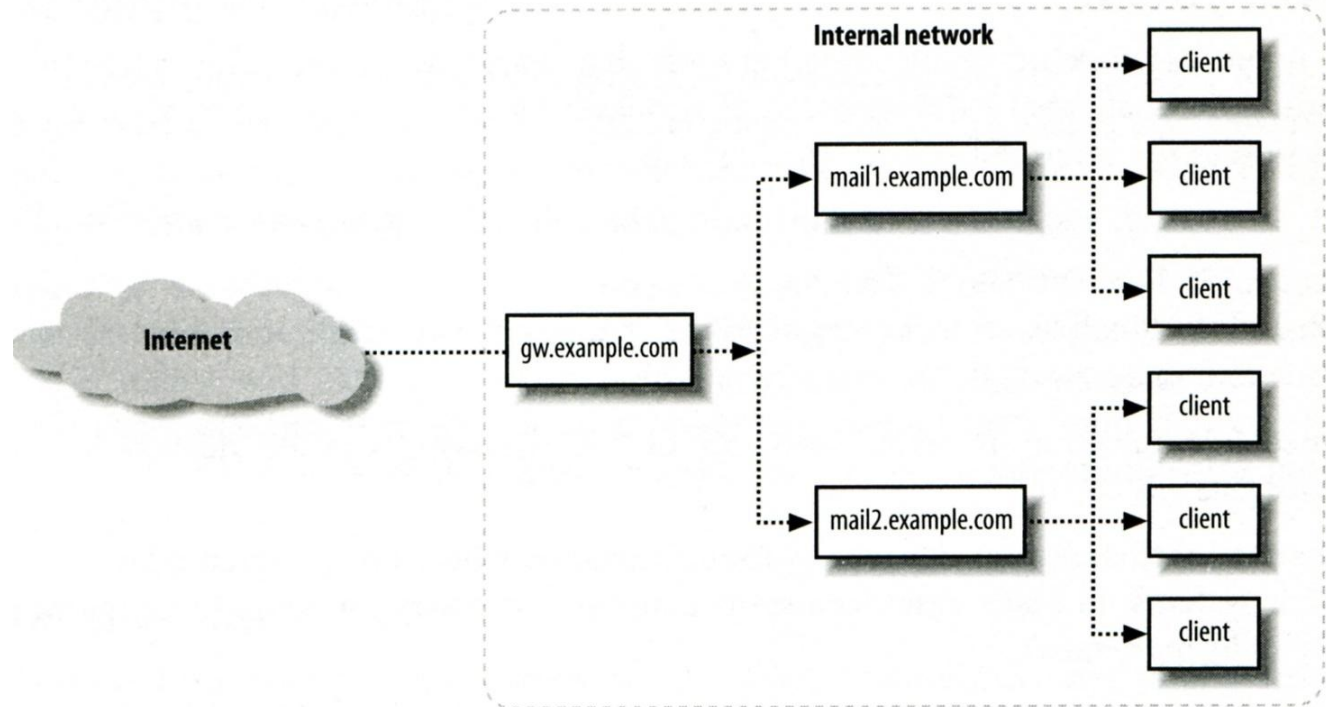
<code>example.com</code>	<code>smtp:[192.168.23.56]:20025</code>
<code>orillynet.com</code>	<code>smtp</code>
<code>ora.com</code>	<code>maildrop</code>
<code>kdent@ora.com</code>	<code>error:no mail accepted for kdent</code>

# Mail Relaying – Transport Maps (2)

- Usage in transport map
  - MX → Local delivery mail server
  - mailpost to bbs/news
  - Postponing mail relay
    - Such as ISP has to postpone until customer network is online
    - In transport:  
abc.com            ondemand
    - In /usr/local/etc/postfix/master.cf  
ondemand    unix   - - n   - - smtp
    - In /usr/local/etc/postfix/main.cf  
defer\_transports = ondemand  
transport\_maps = hash:/usr/local/etc/postfix/transport
  - Whenever the customer network is online, do
    - # postqueue -s abc.com

# Mail Relaying – Inbound Mail Gateway (1)

- Inbound Mail Gateway (MX)
  - Accept all mail for a network from the Internet and relays it to internal mail systems
  - Ex:
    - csmx1.cs.nctu.edu.tw is a IMG
    - csmailgate.cs.nctu.edu.tw is internal mail system





# Mail Relaying – Inbound Mail Gateway (2)

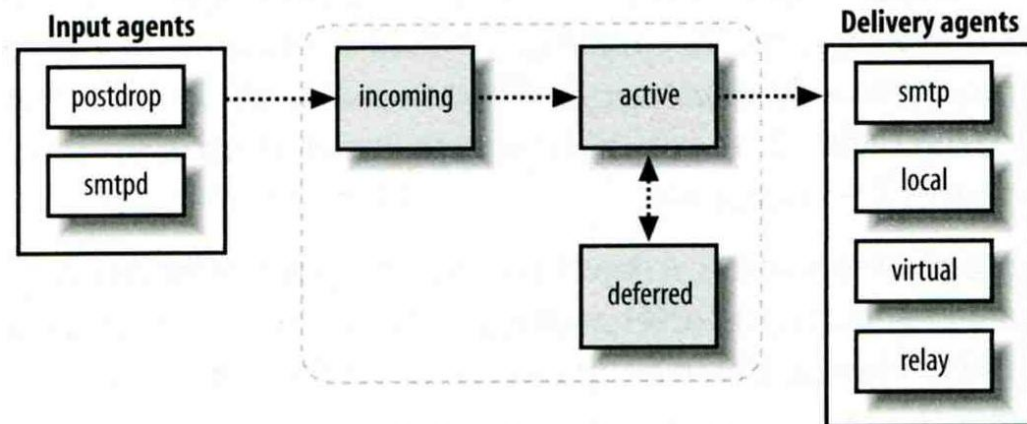
- To be IMG, suppose
  - You are administrator for cs.nctu.edu.tw
  - You have to be the IMG for secureLab.cs.nctu.edu.tw and javaLab.cs.nctu.edu.tw
    - Firewall only allow outsource connect to IMG port 25
- 1. The MX record for secureLab.cs.nctu.edu.tw and javaLab.cs.nctu.edu.tw should point to csmx1.cs.nctu.edu.tw
- 2. In csmx1.cs.nctu.edu.tw,
  - relay\_domains = secureLab.cs.nctu.edu.tw javaLab.cs.nctu.edu.tw
  - transport\_maps = hash:/usr/local/etc/postfix/transport
  - secureLab.cs.nctu.edu.tw relay:[secureLab.cs.nctu.edu.tw]
  - javaLab.cs.nctu.edu.tw relay:[javaLab.cs.nctu.edu.tw]
- 3. In secureLab.cs.nctu.edu.tw ( and so do javaLab.cs.nctu.edu.tw)
  - mydestination = secureLab.cs.nctu.edu.tw

# Mail Relaying – Outbound Mail Gateway

- ❑ Outbound Mail Gateway
  - Accept mails from inside network and relay them to Internet hosts
  
- ❑ To be OMG, suppose
  - You are administrator for cs.nctu.edu.tw
  - You have to be the OMG for secureLab.cs.nctu.edu.tw and javaLab.cs.nctu.edu.tw
- 1. In main.cf of csmailer.cs.nctu.edu.tw
  - `mynetworks = hash:/usr/local/etc/postfix/mynetworks`
    - `secureLab.cs.nctu.edu.tw`
    - `javaLab.cs.nctu.edu.tw`
- 2. All students in secureLab/javaLab will configure there MUA to use secureLab/javaLab.cs.nctu.edu.tw to be the SMTP server
- 3. In main.cf of secureLab/javaLab.cs.nctu.edu.tw,
  - `relayhost = [csmailer.cs.nctu.edu.tw]`

# Queue Management

- The queue manage daemon
  - qmgr daemon
  - Unique queue ID
  - Queue directories (/var/spool/postfix/\*)
    - active, bounce, corrupt, deferred, hold
- Message movement between queues
  - Temporary problem → deferred queue
  - qmgr takes messages alternatively between incoming and deferred queue to active queue



# Queue Management – Queue Scheduling

- Double delay in deferred messages
  - Between
    - `minimal_backoff_time` = 300s
    - `maximal_backoff_time` = 4000s
  - qmgr daemon periodically scan deferred queue for reborn messages
    - `queue_run_delay` = 300s
- Deferred → bounce
  - `maximal_queue_lifetime` = 5d

# Queue Management – Message Delivery

- Controlling outgoing messages
  - When there are lots of messages in queue for the same destination, it should be careful not to overwhelm it
  - If concurrent delivery is success, postfix can increase concurrency between:
    - `initial_destination_concurrency = 5`
    - `default_destination_concurrency_limit = 20`
    - Under control by
      - `maxproc` in `/usr/local/etc/postfix/master.cf`
    - You can override the `default_destination_concurrency_limit` for any transport mailer:
      - `smtp_destination_concurrency_limit = 25`
      - `local_destination_concurrency_limit = 10`
  - Control how many recipients for a single outgoing message
    - `default_destination_recipient_limit = 50`
    - You can override it for any transport mailer in the same idea:
      - `smtp_destination_recipient_limit = 100`

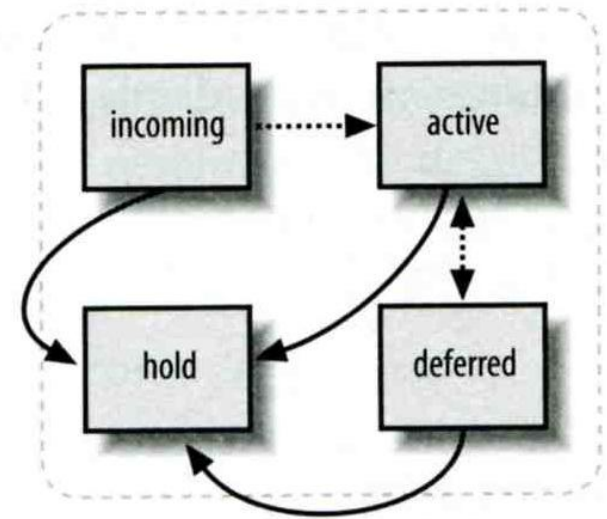
# Queue Management – Error Notification

- Sending error messages to administrator
  - Set `notify_classes` parameter to list error classes that should be generated and sent to administrator
    - Ex: `notify_classes = resource, software`
  - Error classes

Error Class	Description	Noticed Recipient (all default to postmaster)
bounce	Send headers of bounced mails	bounce_notice_recipient
2bounce	Send undeliverable bounced mails	2bounce_notice_recipient
delay	Send headers of delayed mails	delay_notice_recipient
policy	Send transcript when mail is reject due to anti-spam restrictions	error_notice_recipient
protocol	Send transcript that has SMTP error	error_notice_recipient
resource	Send notice because of resource pro.	error_notice_recipient
software	Send notice because of software pro.	error_notice_recipient

# Queue Management – Queue Tools (1)

- `postqueue` command
  - `postqueue -p`
    - Generate sendmail mailq output
  - `postqueue -f`
    - Attempt to flush(deliver) all queued mail
  - `postqueue -s cs.nctu.edu.tw`
    - Schedule immediate delivery of all mail queued for site
- `postsuper` command
  - Delete queued messages
    - `postsuper -d E757A3428C6` (from incoming, active, deferred, hold)
    - `postsuper -d ALL`
  - Put messages “on hold” so that no attempt is made to deliver it
    - `postsuper -h E757A3428C6` (from incoming, active, deferred)
  - Release messages in hold queue
    - `postsuper -H ALL`
  - Requeue messages into maildrop queue (maildrop → pickup → cleanup → incoming)
    - `postsuper -r E757A3428C6`
    - `postsuper -r ALL`



# Queue Management – Queue Tools (2)

- postcat
  - Display the contents of a queue file

```
nasa [/home/liuyh] -liuyh- mailq
-Queue ID- --Size-- ----Arrival Time---- -Sender/Recipient-----
3314234284A    602 Sat May 19 04:16:20 root@nasa.cs.nctu.edu.tw
              (connect to csmx1.cs.nctu.edu.tw[140.113.235.104]:25: Operation timed out)
              liuyh@cs.nctu.edu.tw
```

```
nasa [/home/liuyh] -liuyh- sudo postcat -q 3314234284A
*** MESSAGE LIST deferred/3/3314234284A ***
message_size:      602      214      1      0      602
message_arrival_time: Sat May 19 04:16:20 2012
create_time: Sat May 19 04:16:20 2012
sender: root@nasa.cs.nctu.edu.tw
named_attribute: rewrite_context=local
original_recipient: root
recipient: liuyh@cs.nctu.edu.tw
*** MESSAGE LIST deferred/3/3314234284A ***
Received: by nasa.cs.nctu.edu.tw (Postfix)
      id 3314234284A; Sat, 19 May 2012 04:16:20 +0800 (CST)
Delivered-To: root@nasa.cs.nctu.edu.tw
Received: by nasa.cs.nctu.edu.tw (Postfix, from userid 0)
      id 2CB713427A5; Sat, 19 May 2012 04:16:20 +0800 (CST)
To: root@nasa.cs.nctu.edu.tw
Subject: nasa.cs.nctu.edu.tw weekly run output
Message-Id: <20120518201620.2CB713427A5@nasa.cs.nctu.edu.tw>
Date: Sat, 19 May 2012 04:16:20 +0800 (CST)
From: root@nasa.cs.nctu.edu.tw (NASA Root)
```

Rebuilding locate database:

Rebuilding whatis database:

...



# Multiple Domains

- Use single system to host many domains
  - Ex:
    - We use csmailgate.cs.nctu.edu.tw to host both
      - cs.nctu.edu.tw
      - csie.nctu.edu.tw
    - Purpose
      - Can be used for final delivery on the machine or
      - Can be used for forwarding to destination elsewhere
  - Important considerations
    - Does the same user id with different domain should go to the same mailbox or different mailbox ?
      - YES (shared domain)
      - NO (Separate domain)
    - Does every user require a system account in /etc/passwd ?
      - YES (system account)
      - NO (virtual account)

# Multiple Domains –

## Shared Domain with System Account

- Situation
  - The mail system should accept mails for both canonical and virtual domains and
  - The same mailbox for the same user id
- Procedure
  - Modify “mydomain” to canonical domain
  - Modify “mydestination” parameter to let mails to virtual domain can be local delivered
  - Ex:
    - mydomain = cs.nctu.edu.tw
    - mydestination = \$myhostname, \$mydomain, csie.nctu.edu.tw
- ✘ In this way, mail to both [chwong@cs.nctu.edu.tw](mailto:chwong@cs.nctu.edu.tw) and [chwong@csie.nctu.edu.tw](mailto:chwong@csie.nctu.edu.tw) will go to csmailgate: /var/mail/chwong
- Limitation
  - Can not separate [chwong@cs.nctu.edu.tw](mailto:chwong@cs.nctu.edu.tw) from [chwong@csie.nctu.edu.tw](mailto:chwong@csie.nctu.edu.tw)

# Multiple Domains –

## Separate Domains with System Accounts

- Situation

- The mail system should accept mails for both canonical and virtual domains and
- Mailboxes are not necessarily the same for the same user id

- Procedure

- Modify “mydomain” to canonical domain
- Modify “virtual\_alias\_domains” to accept mails to virtual domains
- Create “virtual\_alias\_maps” map

- Ex:

- mydomain = cs.nctu.edu.tw
- virtual\_alias\_domains = abc.com.tw, xyz.com.tw
- virtual\_alias\_maps = hash:/usr/local/etc/postfix/virtual

- In /usr/local/etc/postfix/virtual

- [CEO@abc.com.tw](mailto:CEO@abc.com.tw) andy
- [@xyz.com.tw](mailto:@xyz.com.tw) jack

- Limitation

- Need to maintain UNIX account for virtual domain user

# Multiple Domains –

## Separate Domains with Virtual Accounts (1)

- Useful when users in virtual domains:
  - Do not need to login to system
  - Only need to retrieve mail through POP/IMAP server
- Procedure
  - Modify “virtual\_mailbox\_domains” to let postfix know what mails it should accepts
  - Modify “virtual\_mailbox\_base” and create related directory to put mails
  - Create “virtual\_mailbox\_maps” map
  - Ex:
    - virtual\_mailbox\_domain = abc.com.tw, xyz.com.tw
    - virtual\_mailbox\_base = /var/vmail
    - Create /var/vmail/abc-domain and /var/vmail/xyz-domain
    - virtual\_mailbox\_maps = hash:/usr/local/etc/postfix/vmailbox
  - In /usr/local/etc/postfix/vmailbox
    - [CEO@abc.com.tw](mailto:CEO@abc.com.tw) abc-domain/CEO (Mailbox format)
    - [CEO@xyz.com.tw](mailto:CEO@xyz.com.tw) xyz-domain/CEO/ (Maildir format)

# Multiple Domains – Separate Domains with Virtual Accounts (2)

- Ownerships of virtual mailboxes
  - Simplest way:
    - The same owner of POP/IMAP Servers
  - Flexibility in postfix
    - virtual\_uid\_maps and virtual\_gid\_maps
    - Ex:
      - virtual\_uid\_maps = static:1003
      - virtual\_gid\_maps = static:105
    - virtual\_uid\_maps = hash:/usr/local/etc/postfix/virtual\_uids
    - virtual\_uid\_maps = hash:/usr/local/etc/postfix/virtual\_uids static:1003
  - In /usr/local/etc/postfix/virtual\_uids
    - CEO@abc.com.tw 1004
    - CEO@xyz.com.tw 1008