qmail

an internet mail transport agent

or

qmail – fast, secure, reliable. Pick any three!

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MUA

Mail user agent. Allows an end user to read incoming mail, respond to this mail and compose new messages.

MTA

Mail transport agent. Responsible for transporting electronic mail from one location to another.

MDA

Mail delivery agent. Responsible for delivering an electronic mail message to its final destination. May be part of the same software suite as the MTA.

ENVELOPE

Name and address of both the message originator and message recipient(s). Used during the transaction between MTAs.

HEADERS

Name and address of both the message originator and message recipient(s) plus extra details such as the date, subject and delivery details.

BODY

Message data.

Simplified mail transaction
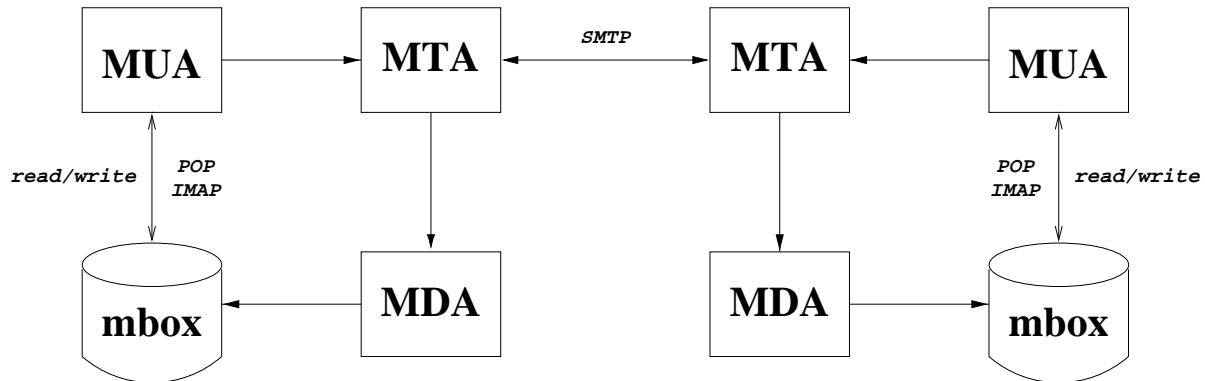
The user composes a message using an **MUA.**

The **MUA** gives it to the **MTA** to arrange delivery.

If the message is local, the **MTA** gives it to the local **MDA** which delivers it to the local mailbox where it is available for reading by the **MUA.**

If the message is for a remote recipient, the **MTA** gives it to a remote **MTA** which in turn gives it to that system's **MDA** which delivers it to the remote mailbox.

qmail history[1]

Dan Bernstein began developing qmail in 1995 in an attempt to avoid the security problems and other deficiencies he saw in sendmail.

The first beta version was 0.70 released in January 1996.

The first production version – 1.00 – was released in February 1997.

Version 1.03 was released in June 1998.

It should compile and run on almost any well behaved Unix system.

It is penetrating the sendmail market. Actual details are hard to determine but judging by the mailing list traffic, many people are either using qmail or want to know more.

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[1]This section has been summarised from the qmail distribution files

qmail security

Segmented architecture. Each stage of the message processing is handled by a different program. Each program runs under a different user ID. The qmail users don't even trust each other!

The only setuid program is qmail–queue and it runs as the user *qmailq*.

The only program run by *root* is the mail delivery agent qmail–lspawn.

qmail–lspawn **ALWAYS** changes its effective user id to the recipient **BEFORE** running any user specified program.

qmail **NEVER** delivers to a user whose UID is zero!

qmail will defer delivery if either the user's home directory or .qmail file is group and/or world writable.

qmail security

Parsing is cut down to a bare minimum. This avoids (or at the very least minimises) the risk of introducing a security hole with a configuration error.

The standard C library is avoided – particularly *stdio*.

"Keep It Simple". qmail has only one simple forwarding mechanism that handles forwarding, aliasing and mailing lists, instead of a separate mechanism for each. By default, qmail offers a single delivery mode instead of a selection.

Size comparisons

Number and size of *.c and *.h files[1]

	lines	words	chars	files	;
qmail-1.03	16617	44780	395243	279	10213
postfix-19991231-pl08[2]	72308	256003	1935353	474	16242
smail-3.2	62331	246140	1701112	151	19408
exim-3.14	82269	336176	2552863	147	24014
zmailer-2.2e10	57595	205524	1423624	227	24005
sendmail-8.10.1	80447	263347	1821381	88	24770

qmail has the smallest code base of the major MTA products. It also has the second largest number of files. The obvious assumption that can be made is that qmail adheres to the *"Keep It Simple"* principle.

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[1]No attempt was made to strip out comments

[2]Postfix source files contain embedded man pages

Maildir format

Maildirs are essentially incorruptible storage areas for mail messages. They avoid the potential corruption problems of *mbox* and *mh* formats by removing the need for any file locking.

Maildir format stores each message in a separate file in a given directory:

./tmp/ – the delivery agent creates a file called ./tmp/*time*.pid.hostname where *time* is the number of seconds since midnight January 1 1970 GMT. The incoming mail message is stored in this file. If the file already exists, the delivery agent waits 2 seconds and tries again.

./new/ – successfully delivered messages are moved to ./new/*time*.pid.hostname. The modification time of the file is the delivery date.

./cur/ – messages read by a mail reader are moved to ./cur/*time*.pid.hostname.

Aliasing and .qmail files

Users control all addresses of the form *user–anything.*

Addresses which do not map to user names are handled by the special *alias* user.

Arbitrary addresses can be assigned to specific users using the qmail–users mechanism.

Delivery instructions are handled by .qmail–*ext* files where *ext* is an arbitrary extension.

If my user name is *psamuel,* I can create a ~/.qmail–jokes file so that mail sent to *psamuel–jokes* will be handled by that file.

qmail provides a number of useful environment variables for use in .qmail files.

Aliasing and .qmail files

.qmail files can contain any combination of addresses and Unix programs. Each line is a separate delivery instruction.

Exit codes of Unix commands govern further processing of the .qmail file.

0	successful delivery
99	successful delivery, ignore all further delivery instructions
100	permanent delivery failure (hard error)
111	transient delivery failure, try again later (soft error)

Example .qmail **file**[1]

---

[1] This page is intentionally left blank to illustrate the fact that a .qmail file is not mandatory.

Example .qmail–*ext* **file**

A zero byte .qmail file instructs qmail–local to deliver the message to the user's default mailbox.

–rw–r—r— 1 psamuel   0 Oct 29 18:26 .qmail–*ext*

Example .qmail file

```
# This file is not empty but does nothing.

# Therefore the message will be successfully

# delivered to nowhere. This is the equivalent

# of delivering the message to /dev/null.
```

Example .qmail–jokes file

```
# Save msgs from the jokes list in a separate mbox.
# Incoming mail will be addressed to psamuel-jokes.
/home/psamuel/mail/JOKES
```

Example .qmail file

```
# My vacation .qmail file


# Completely ignore the message if the sender is
# ddts@x.com. 99 says that the message was delivered
# successfully but do not attempt further delivery
# instructions in the .qmail file. 0 says delivery
# was a success and continue processing the file.
| [ "$SENDER" = "ddts@x.com" ] && exit 99 || exit 0


# Run other msgs thru vacation. Use qmail-vacation to
# avoid problems with preline & other vacation progs.
| /usr/local/bin/vacation -j psamuel


# Send a copy to my ISP account. The & is only
# necessary if the address does not begin with
# an alphanumeric character such as | or /.
&peter@isp.com.au


# Save a local copy - most important, otherwise
# there will be no local delivery. Also save a copy
# to a maildir so that I can quickly scan individual
# messages when I return. The trailing slash
# indicates a maildir instead of an mbox.
/home/psamuel/Mailbox
/home/psamuel/Maildir/
```

Mandatory qmail control file

qmail requires a single control file for its operation:

    /var/qmail/control/me

This file contains the fully qualified host name of the current host. If this file is missing, the major qmail programs, qmail–smtpd, qmail–send and qmail–remote, will refuse to run.

Optional qmail control files[1]

control file	default value	used by
badmailfrom	`(none)`	qmail-smtpd
bouncefrom	`MAILER-DAEMON`	qmail-send
bouncehost	*me*	qmail-send
concurrencylocal	`10`	qmail-send
concurrencyremote	`20`	qmail-send
defaultdomain	*me*	qmail-inject
defaulthost	*me*	qmail-inject
databytes	`0`	qmail-smtpd
doublebouncehost	*me*	qmail-send
doublebounceto	`postmaster`	qmail-send
envnoathost	*me*	qmail-send
helohost	*me*	qmail-remote
idhost	*me*	qmail-inject
localiphost	*me*	qmail-smtpd
locals	*me*	qmail-send
morercpthosts	`(none)`	qmail-smtpd
percenthack	`(none)`	qmail-send
plusdomain	*me*	qmail-inject
qmqpservers	`(none)`	qmail-qmqpc
queuelifetime	`604800`	qmail-send
rcpthosts	`(none)`	qmail-smtpd
smtpgreeting	*me*	qmail-smtpd
smtproutes	`(none)`	qmail-remote
timeoutconnect	`60`	qmail-remote
timeoutremote	`1200`	qmail-remote
timeoutsmtpd	`1200`	qmail-smtpd
virtualdomains	`(none)`	qmail-send

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[1]Taken from the `qmail-control` manual page

Example mail network
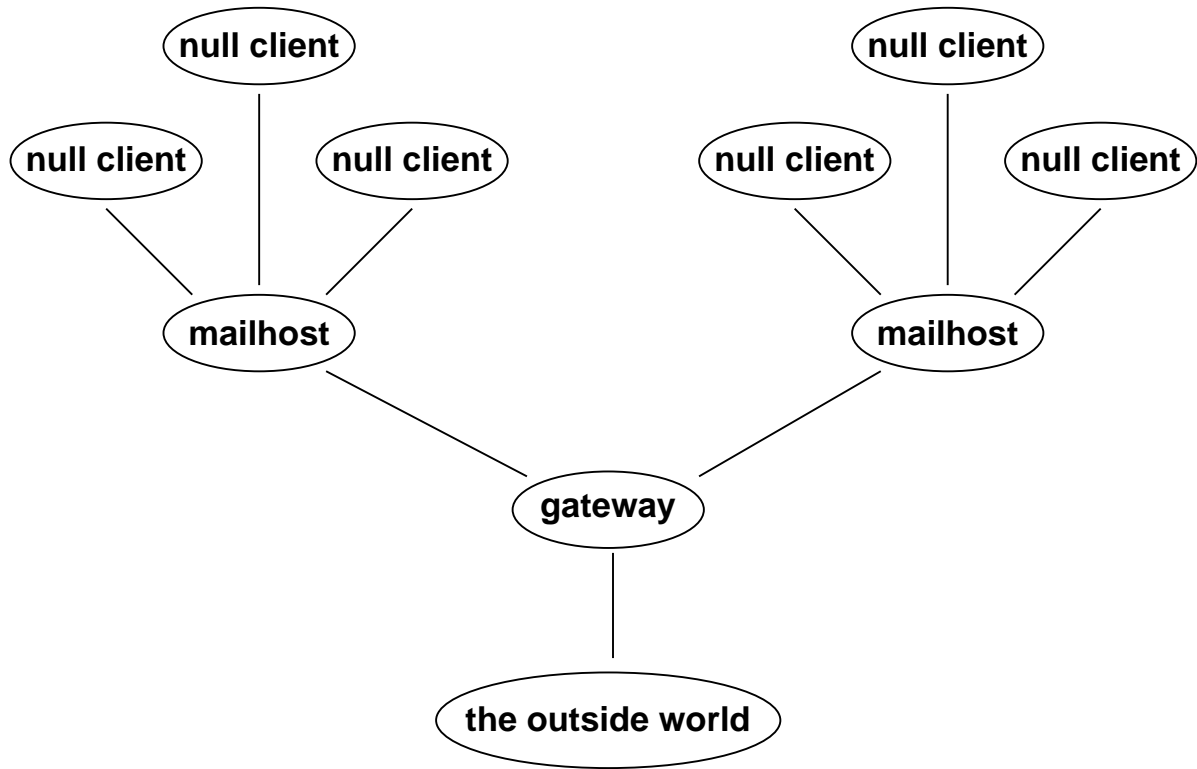
Configuring a null client

A null client is a machine which does **NO** local mail delivery.

ALL outgoing mail is sent to a single mailhost.

/var/qmail/control/locals – an empty file

/var/qmail/control/smtproutes

```
:mailhost.devel.domain.com
```

If you can't resolve host names you can use the IP address instead.

/var/qmail/control/smtproutes

```
:[123.45.67.89]
```

Configuring a null client

If you are using qmail–1.03 or later you can eliminate **ALL** local mail queueing by using **QMQP** (Quick Mail Queueing Protocol) instead of **SMTP.**

On the client

/var/qmail/bin/qmail–queue – a symbolic link to /var/qmail/bin/qmail–qmqpc

/var/qmail/control/locals – an empty file

/var/qmail/control/qmqpservers

```
123.45.67.89
```

On the server

/etc/init.d/qmqpd – or an appropriate startup file

```
tcpserver -u 29991 -g 29998 -c 100 -v -R \
    -x /var/qmail/etc/qmqpd/rules.cdb \
    0 qmqp /var/qmail/bin/qmail-qmqpd
```

/etc/services

```
qmqp    628/tcp             mail
```

Configuring a mailhost

A mailhost is a machine that will perform all the local deliveries for a site.

It accepts mail from null clients and from external sources.

It sends **ALL** outgoing mail to a single mail gateway.

/var/qmail/control/locals

```
mailhost.devel.domain.com
devel.domain.com
```

/var/qmail/control/smtproutes

```
:gateway.domain.com
```

/etc/init.d/smtpd – or an appropriate startup file

```
tcpserver -u 29991 -g 29998 -c 100 -v -R \
    -x /var/qmail/etc/smtpd/rules.cdb \
    0 smtp /var/qmail/bin/qmail-smtpd
```

Configuring a gateway

A gateway is a machine that sends incoming mail to the relevant internal mailhost.

It accepts mail from mail hosts and from external sources.

It sends **ALL** outgoing mail to the relevant MX host.

/var/qmail/control/locals

```
gateway.domain.com

domain.com
```

/var/qmail/control/smtproutes

```
devel.domain.com:mailhost.devel.domain.com

sales.domain.com:mailhost.sales.domain.com
```

/etc/init.d/smtpd – or an appropriate startup file

```
tcpserver -u 29991 -g 29998 -c 100 -v -R \
    -x /var/qmail/etc/smtpd/rules.cdb \
    0 smtp /var/qmail/bin/qmail-smtpd
```

Host masquerading

"How do I set up host masquerading?"

/var/qmail/control/defaultdomain

```
devel.domain.com
```

Unqualified `From:` addresses will now have `devel.domain.com` appended.

Users can also modify their `From:` headers by using environment variables.

```
export QMAILHOST=some.domain
export QMAILNAME="Peter Samuel"
export QMAILUSER=Peter.Samuel
export QMAILINJECT=f
```

This becomes:

```
From: Peter Samuel <Peter.Samuel@some.domain>
```

Virtual domains

/var/qmail/control/virtualdomains

```
cardassia.empire:garok
ferengi.alliance:quark
klingon.empire:worf
starfleet.fed:kirk
```

Mail for *user@klingon.empire* will be rewritten as *worf–user@klingon.empire* and delivered locally to the user *worf* according to the instructions in ~worf/.qmail–*user* or ~worf/.qmail–default.

Virtual domains

Virtual domains can also be specified for user addresses as well.

```
postmaster@clown.org:alias-clown_org

postmaster@pond.net:alias-swamp

webmaster@clown.org:alias-clown_org

clown.org:bozo

pond.net:frogman
```

This example shows that mail specifically address to the postmaster or webmaster of the virtual domains will be handled by the alias user, whereas mail for any other users in these virtual domains will be handled by the users bozo and frogman respectively.

Handling SPAM[1]

SPAM is another name for Unsolicited Commercial Email or UCE. qmail has a number of mechanisms for limiting the amount of SPAM received.

The default configuration does not support the *"percent hack"* address convention. An address of the form

> *user%domain1@domain2*

will **NOT** be forwarded to *domain1*. The *"percent hack"* can be enabled for given domains using a control file.

qmail can be configured to prevent mail relaying by specifying valid incoming domains in /var/qmail/control/rcpthosts. This can be overridden by conditionally setting the **$RELAYCLIENT** environment variable for each invocation of qmail–smtpd using tcpserver or tcpd.

Mail from individual users or complete domains can be banned by specifying the address or domain in /var/qmail/control/badmailfrom.

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[1] SPAM is a social problem. There is no completely technical solution to prevent SPAM.

Handling SPAM

Specific IP address connection control can be achieved using tcpserver, part of Dan's ucspi-tcp package (**http://cr.yp.to/ucspi-tcp.html**). You can also use tcp_wrappers (**ftp://ftp.win.tue.nl/pub/security**).

As part of the ucspi-tcp package, Dan has released rblsmtpd which blocks spam according to the *Real Time Blacklist*. See **http://cr.yp.to/ucspi-tcp/rblsmtpd.html** for details on rblsmtpd. It can also be used with the *ORBS* and *DUL* systems. See **http://maps.vix.com/rbl** for more details on the *Real Time Blacklist*.

There are a number of anti-spam patches for qmail−smtpd available from **http://www.qmail.org**

If SPAM control is a serious issue, you may be better off using a different **SMTP** daemon such as smtpd from **http://www.obtuse.com/smtpd.html.**

For other SPAM solutions, see the offerings at **http://spam.abuse.net/spam/.**

Virus scanning

Virus scanning can be performed by either wrapping qmail–queue, or by using an MDA which supports third party extensions such as procmail.

Jason Haar's Scan4Virus package wraps qmail–queue and then calls a third party virus scanner[1] such as McAfee's or AVP's products. Suspect messages are quarantined and the quarantine officer is notified. See **http://www.geocities.com/jhaar/scan4virus.**

The current version of AMaViS has some untested support for qmail. See **http://www.amavis.org.**

Kaspersky Labs – **http://www.avp.ru** – has provided qmail support for AVP's virus scanner – **http://www.avp.com.**

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[1] Ensure that the vendor has a version that will run on your particular hardware platform.

Disadvantages of using qmail

qmail is an internet mailer. It will only talk **SMTP** to other MTAs. (It can be configured to use a more efficient protocol when talking to other qmail systems).

It will **ONLY** handle addresses which are in the form of *user@domain.* UUCP style addresses such as *domain!user* are definitely **NOT** supported. However transport through UUCP is easy to set up for both incoming and outgoing messages.

It makes every effort to conform to the existing standards and RFCs. Non conforming systems may have difficulty in communicating with qmail–smtpd. Some patches are available to alleviate this problem. See **http://www.qmail.org.**

Header re–writing is minimal. However inserting your own rewrite program is easy.

Disadvantages of using qmail

The author is resistant to change unless it can be shown that the change is absolutely necessary. He is known as being quite arrogant and dogmatic. Unfortunately (or fortunately depending on your point of view) he's usually right. 🙂

qmail requires a completely different mind set than sendmail. It does take some time to begin to think in a qmail fashion – especially if you are used to thinking in a sendmail fashion.

Distributing modified versions of qmail – including ports – require the author's explicit permission. Dan wants to make certain that distributions do not unintentionally compromise performance, operation and security.

Pre-compiled binary versions of qmail may be distributed provided the package conforms to the guidelines set down by the author. See **http://cr.yp.to/qmail/dist.html** for more details.

The big qmail picture

THE BIG Qmail PICTURE

Version 1.03 for qmail 1.03

This picture is intended to give a broad overview of on how all the small qmail programs fit together and to have an quick reference handy. The man pages of the programs give more information on how things are working in detail.

tcpserver
Command line parameters:
[-qQvdDoOpPHhRr1]
[-climit] [-backlog]
[-xrules.cdb] [-ggid] [-uuid]
[-llocalname] [-ttimeout]
host port program [arg ...]

Environment Variables:
none

Configuration files:
rules.cdb

qmail-smtpd
Command line parameters:
none

Environment Variables:
PROTO (TCP)
TCPLOCALHOST
TCPLOCALIP
TCPLOCALPORT
TCPREMOTEHOST
TCPREMOTEINFO
TCPREMOTEIP
TCPREMOTEPORT
RELAYCLIENT

Configuration files:
badmailfrom
databytes
localhost (me)
rcpthosts
morercpthosts (cdb format)
smtpgreeting (me)
timeoutsmtpd (1200)

qmail-queue
Command line parameters:
none

Environment Variables:
none

Configuration files:
none

Exit codes:
0 success
11 address too long
51 out of memory
52 timeout
53 write error
54 read error
61 problem with qmail homedir
62 problem with queuedir
63 problem with queue/pid
64 problem with queue/mess
65 problem with queue/intd
66 problem with tcdb
81 internal bug, eg. segfault
91 envelope format error

qmail-rspawn
Command line parameters:
none

Environment Variables:
none

Configuration files:
none

Exit codes:
0 success
100 permanent error (bounce)
111 soft error (retry later)

qmail-remote
Command line parameters:
host
sender
recip [recip ...]

Environment Variables:
none

Configuration files:
helohost (me)
smtproutes
timeoutconnect (60)
timeoutremote (1200)

Exit codes:
always 0 and all errors come
back as clear text

qmail-inject
Command line parameters:
[-nNaAHH]
[-fsender]
recip

Environment Variables:
QMAILUSER
MAILUSER
USER
LOGNAME
QMAILHOST
MAILHOST
QMAILNAME
MAILNAME
NAME
QMAILINJECT
QMAILDEFAULTDOMAIN
QMAILDEFAULTHOST
QMAILIDHOST
QMAILPLUSDOMAIN

Configuration files:
defaultdomain (me)
defaulthost (me)
idhost (me)
plusdomain (me)

qmail-send
Command line parameters:
none

Environment Variables:
none

Configuration files:
bouncefrom (mailer-daemon)
bouncehost (me)
concurrencylocal (10)
concurrencyremote (20)
doublebouncehost (me)
doublebounceto (postmaster)
envnoathost (me)
locals (me)
percenthack
queuelifetime (604800)
virtualdomains

Remarks:
virtualdomains are handled
after locals

qmail-lspawn
Command line parameters:
aliasempty

Environment Variables:
none

Configuration files:
~users/cdb
~bin/qmail-getpw

Exit codes:
0 success
100 aliasempty missing
111 soft error (retry later)
Most errors come back as
clear text

qmail-local
Command line parameters:
[-nN]
user
homedir
local
dash
ext
domain
sender
aliasempty

Environment Variables:
none

Configuration files:
~home/.qmail
~alias/.qmail

Exit codes:
0 success
1 fatal error
2 chdir error
3 SIGALRM
4 try unlink/kmp() error
100 permanent error (bounce)
111 soft error (retry later)
Most errors come back as
clear text

.qmail
Content:
#comment
|program to execute
&forwarding email address
./mailbox deliver to Mbox
./maildir/ deliver to Maildir

Exit codes of program:
0 success
99 success and abort .qmail
100 permanent error (bounce)
111 soft error (retry later)

Diagram flow

SMTP from network
remote mailserver → tcpserver / tcp-env / inetd → qmail-smtpd → qmail-queue

from local
MUA → qmail-inject → qmail-queue (forwarded message)

qmail-system
qmail-queue → qmail-send
qmail-send → qmail-rspawn → qmail-remote → remote mailserver (to remote)
qmail-send → qmail-lspawn → qmail-local → mbox / maildir / program delivery (to local)

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The big qmail picture

© 1998 Andre Oppermann. Reproduced with permission.

The original version of this slide is missing the qmail–popup box. It has been fixed in this version.

The big qmail picture

dot-qmail programs

bouncesaying

Description:
bounce each incoming message (according to the exit value of [program])

Command line parameters:
in .qmail:
|bouncesaying
error
[program [arg ...]]

Environment Variables:
none

Configuration files:
none

Exit codes of program:
0 bounce and say error
111 soft error (retry later)
all other errors are ignored
and the rest of .qmail will be
processed as usual

condredirect

Description:
redirect message to another address according to the exit value of program

Command line parameters:
in .qmail:
|condredirect
newaddress
program [arg ...]

Environment Variables:
none

Configuration files:
none

Exit codes of program:
0 forward to newaddress
111 soft error (retry later)
all other errors are ignored
and the rest of .qmail will be
processed as usual

except

Description:
reverse the exit code of a program

Command line parameters:
in .qmail:
|except
program [arg ...]

Environment Variables:
none

Configuration files:
none

Exit codes of program:
0 except exits 100
111 soft error (retry later)
all other errors are ignored
and the rest of .qmail will be
processed as usual

forward

Description:
forward message to one or more addresses

Command line parameters:
in .qmail:
|forward
address ...

Environment Variables:
none

Configuration files:
none

Exit codes of program:
none

preline

Description:
prepend UUCP-style lines

Command line parameters:
in .qmail:
|preline
command
[-d] (no Delivered-To line)
[-f] (no From_ line)
[-r] (no Return-Path line)

Environment Variables:
none

Configuration files:
none

Exit codes of program:
none

Remarks:
is useful for procmail and
ELM's filter

qbiff

Description:
announce new message the moment it arrives

Command line parameters:
in .qmail:
|qbiff

Environment Variables:
none

Configuration files:
none

Exit codes:
none

Remarks:
writes a message to your
screen whenever a new
message is delivered

qlist

Description:
handle mailing list subscription requests

Command line parameters:
in .qmail-list-request:
|qlist
read man page for details

Environment Variables:
none

Configuration files:
none

Exit codes:
none

Remarks:
read man page for details

qreceipt

Description:
respond to delivery notice requests

Command line parameters:
in .qmail:
|qreceipt
youraddress

Environment Variables:
none

Configuration files:
none

Exit codes:
none

Remarks:
sends a success notice back
to the envelope sender

userland programs

maildirmake

Description:
creates a maildir structure

Command line parameters:
directory

Environment Variables:
none

Configuration files:
none

Exit codes:
none

maildirwatch

Description:
watch for new messages in a maildir

Command line parameters:
you have so set the environment

Environment Variables:
MAILDIR

Configuration files:
none

Exit codes:
none

Remarks:
prints a new mail summary
twice per minute

maildir2mbox

Description:
moves messages from maildir to mbox format

Command line parameters:
you have so set the environment

Environment Variables:
MAILDIR
MAIL
MAILTMP

Configuration files:
none

Exit codes:
none

Remarks:
you should run only one
maildir2mbox at a time

mailsubj

Description:
send a mail message with a subject line

Command line parameters:
subject
recip ...

Environment Variables:
none

Configuration files:
none

Exit codes:
none

Remarks:
reads the body of the
message from its standard
input

The big qmail picture

queue management

qmail-qstat
Description:
summarize status of mail queue

Command line parameters:
none

Environment Variables:
none

Configuration files:
none

Exit codes:
complains if there is a problem

Remarks:
must be run either as root or with gid qmail

qmail-qread
Description:
list outgoing messages and recipients

Command line parameters:
none

Environment Variables:
none

Configuration files:
none

Exit codes:
complains if there is a problem

Remarks:
must be run either as root or with uid qmails and gid qmail

qmail-tcpto
Description:
prints qmail-remote's current list of timeouts

Command line parameters:
none

Environment Variables:
none

Configuration files:
none

Exit codes:
complains if there is a problem

Remarks:
must be run either as root or with uid qmailr and gid qmail

qmail-tcpok
Description:
erases qmail-remote's current list of timeouts

Command line parameters:
none

Environment Variables:
none

Configuration files:
none

Exit codes:
complains if there is a problem

Remarks:
must be run either as root or with uid qmailr and gid qmail

Hint: to reschedule every message in the queue for immediate delivery, do a "kill -ALRM *pid*" on the qmail-send pid
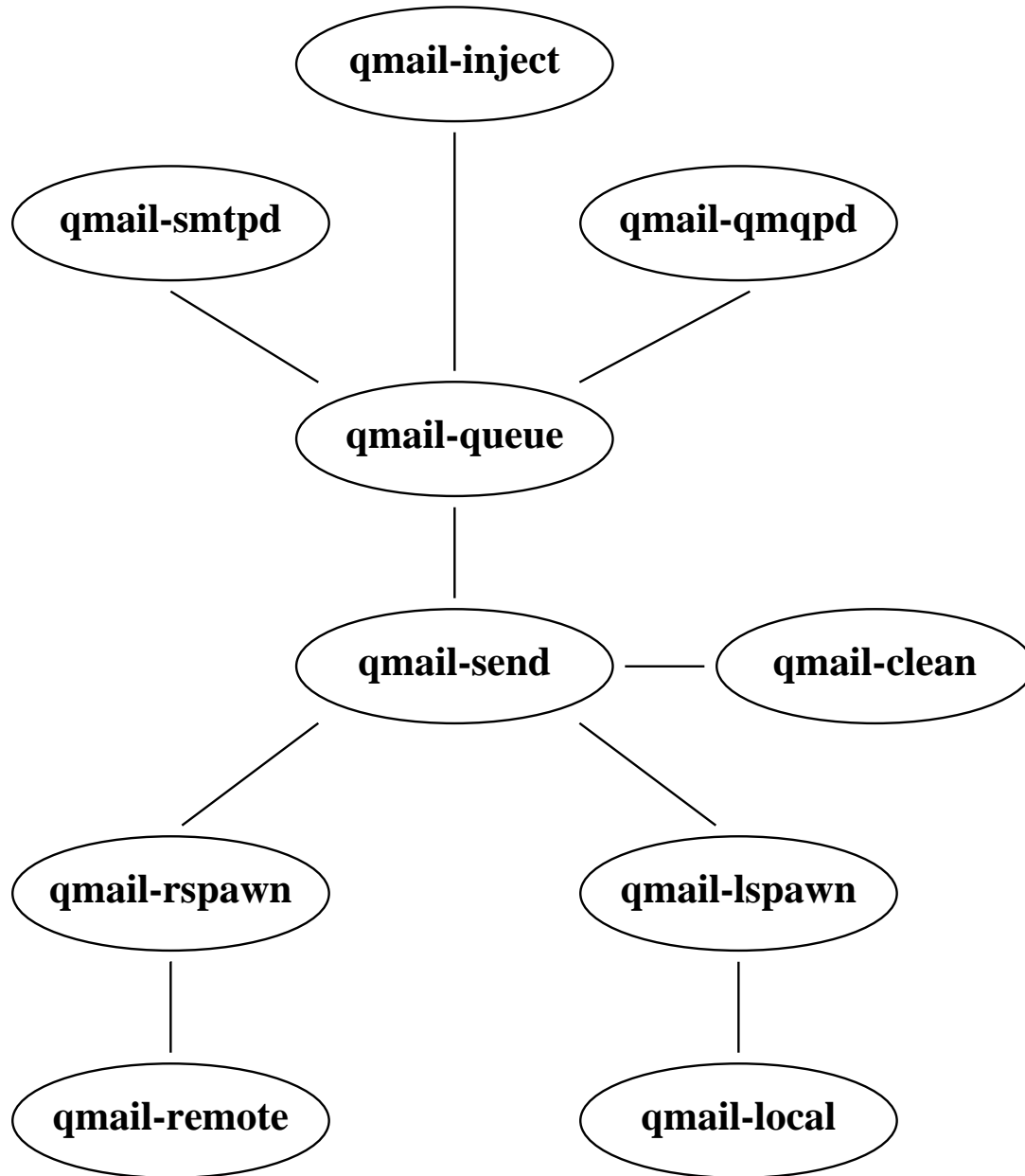
user and system management

qmail-pw2u
Description:
build address assignments from a passwd file

Command line parameters:
[-/ohHuUC] [-cchar]

Environment Variables:
none

Configuration files:
~users/include
~users/exclude
~users/mailnames
~users/subusers
~users/append

Exit codes:
complains if there is a problem

Remarks:
generates ~users/assign

qmail-newu
Description:
prepare address assignments for qmail-lspawn

Command line parameters:
none

Environment Variables:
none

Configuration files:
~users/assign

Exit codes:
complains if there is a problem with ~users/assign qmail-newu

Remarks:
generates ~users/cdb

qmail-newmrh
Description:
prepare morercpthosts for qmail-smtpd

Command line parameters:
none

Environment Variables:
none

Configuration files:
~control/morercpthosts

Exit codes:
complains if there is a problem with control/morercpthosts qmail-newmrh complains

Remarks:
generates ~control/morercpthosts.cdb

qmail-showctl
Description:
analyze the qmail config files

Command line parameters:
none

Environment Variables:
none

Configuration files:
all

Exit codes:
complains if there is a problem

Remarks:
explains the current qmail configuration

other qmail daemons

qmail-start
Description:
turn on mail delivery

Command line parameters:
defaultdelivery
logger [args ...]

Environment Variables:
none

Configuration files:
none

Exit codes:
does not print anything, even on failure

Remarks:
make sure to clean up the environment before starting qmail

qmail-clean
Description:
clean up the queue directory

Command line parameters:
none

Environment Variables:
none

Configuration files:
none

Exit codes:
none

Remarks:
can only be started by qmail-start

splogger
Description:
reads a series of messages and feeds them to syslog

Command line parameters:
[tag [facility]]

Environment Variables:
none

Configuration files:
none

Exit codes:
complains if there is a problem

Remarks:
converts unprintable characters to question marks

How qmail works

qmail-inject

qmail-smtpd   qmail-qmqpd

qmail-queue

qmail-send — qmail-clean

qmail-rspawn   qmail-lspawn

qmail-remote   qmail-local

How qmail works[1]

Incoming mail arrives via either an **SMTP** connection to qmail–smtpd, or a **QMQP** connection to qmail–qmqpd, or via indirect queue injection from qmail–inject.

qmail–smtpd, qmail–qmqpd or qmail–inject calls qmail–queue to place the message in the queue.

qmail–queue splits the message into three files, the message itself and two copies of the envelope details. It then signals qmail–send to begin delivery.

If the message is for a local recipient, qmail–send tells qmail–lspawn to deliver the message. qmail–lspawn calls qmail–local to deliver the message. qmail–local handles alias expansion and, if necessary, calls qmail–queue to place a new message in the queue. qmail–local finally delivers the message to the user's home directory.

If the message is for a remote recipient, qmail–send tells qmail–rspawn to deliver the message. qmail–rspawn calls qmail–remote to deliver the message to a remote MTA.

---

[1]For a detailed explanation of qmail internals, see the `INTERNALS` file distributed with the qmail source code.

Message pre–processing

qmail–queue processes incoming messages as follows:

/var/qmail/queue/pid/*tempfile*

> Temporary file with unique name based on process id and system time.

/var/qmail/queue/mess/0..22/*nnnnn*

> Hard link to /var/qmail/queue/pid/*tempfile*. Filename is the same as its inode. Contains message headers and body. /var/qmail/queue/pid/*tempfile* is removed.

/var/qmail/queue/intd/*nnnnn*

> Message envelope in creation.

/var/qmail/queue/todo/*nnnnn*

> Hard link to /var/qmail/queue/intd/*nnnnn*. Contains completed message envelope. /var/qmail/queue/intd/*nnnnn* is removed.

/var/qmail/queue/lock/trigger

> Named pipe for communication with qmail–send.

The message is now completely pre–processed.

Message processing

qmail–send processes queued messages as follows:

/var/qmail/queue/info/0..22/*nnnnn*

> Envelope `From:` address. Created from /var/qmail/queue/todo/*nnnnn*.

/var/qmail/queue/local/0..22/*nnnnn*

> Envelope `To:` address if recipient is local. Created from /var/qmail/queue/todo/*nnnnn*. qmail–lspawn is notified to deliver the message locally. When all local deliveries have been performed, qmail–send deletes the file.

/var/qmail/queue/remote/0..22/*nnnnn*

> Envelope `To:` address if recipient is remote. Created from /var/qmail/queue/todo/*nnnnn*. qmail–rspawn is notified to deliver the message remotely. When all remote deliveries have been performed, qmail–send deletes the file.

/var/qmail/queue/bounce/*nnnnn*

> If a delivery has a permanent failure, this file is created and/or appended to. When all deliveries are finished a bounce message created from this file and /var/qmail/queue/mess/0..22/*nnnnn* is injected into the queue.

Local to local delivery[1]

Original message:

> **To: fred**
> **Hi.**
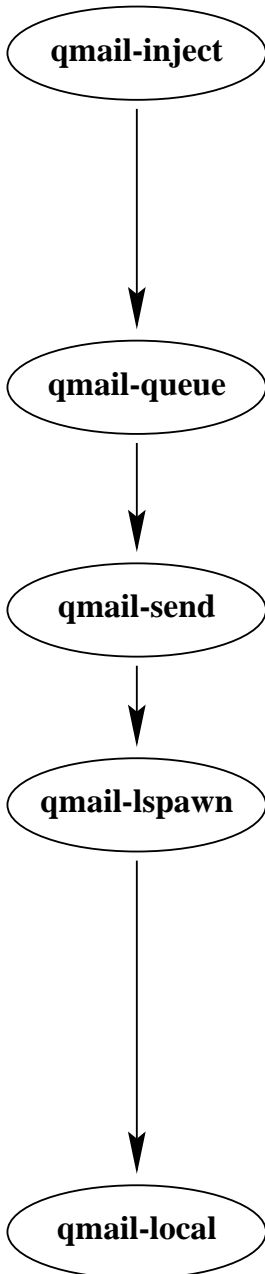
qmail-inject

Fill in the complete envelope and header:

> **(envelope) from joe@heaven.af.mil **
> **to fred@heaven.af.mil**
> **From: joe@heaven.af.mil**
> **To: fred@heaven.af.mil**
>
> **Hi.**

qmail-queue

Store message safely on disk.
Trigger qmail-send.

qmail-send

Look at envelope recipient, fred@heaven.af.mil.
Is heaven.af.mil in locals? Yes.
Deliver locally to fred@heaven.af.mil.

qmail-lspawn

qmail-lspawn ./Mailbox

Look at mailbox name, fred.
Is fred listed in qmail-users? No.
Is there a fred account? Yes.
Is fred's uid nonzero? Yes.
Is ~fred visible to the qmailp user? Yes.
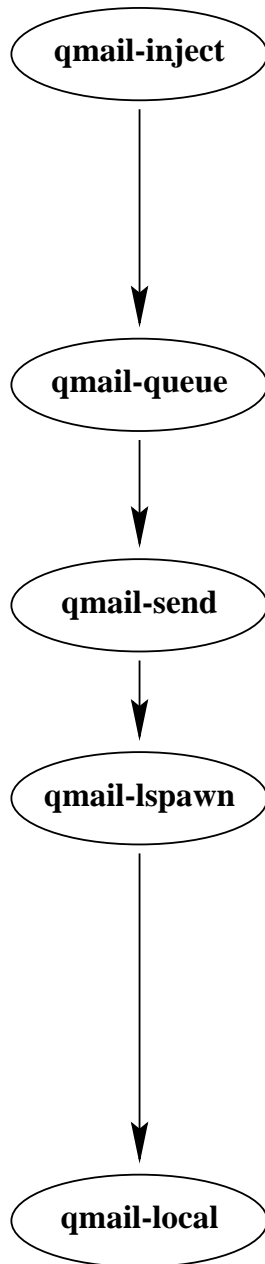**Is ~fred owned by fred? Yes.**
Give control of the message to fred.
Run qmail-local.

qmail-local

**qmail-local fred ~fred fred '' '' heaven.af.mil **
> **joe@heaven.af.mil ./Mailbox**

Does ~fred/.qmail exist? No.
Write message to ./Mailbox in mbox format.

---

[1]Taken from the `PIC.local2local` file distributed with the qmail source code.

Local to local extension delivery[1]

Original message:

   To: fred-sos
   Hi.

qmail-inject

Fill in the complete envelope and header:

   **(envelope) from joe@heaven.af.mil **
     to fred-sos@heaven.af.mil
   From: joe@heaven.af.mil
   To: fred-sos@heaven.af.mil

   Hi.

qmail-queue

Store message safely on disk.
Trigger qmail-send.

qmail-send

Look at envelope recipient,
   fred-sos@heaven.af.mil.
Is heaven.af.mil in locals? Yes.
Deliver locally to fred-sos@heaven.af.mil.

qmail-lspawn

qmail-lspawn ./Mailbox

Look at mailbox name, fred-sos.
Is fred-sos listed in qmail-users? No.
Is there a fred-sos account? No.
Is there a fred account?Yes.
Is fred's uid nonzero? Yes.
Is ~fred visible to the qmailp user? Yes.
Is ~fred owned by fred? Yes.
Give control of the message to fred.
Run qmail-local.

qmail-local

**qmail-local fred ~fred fred-sos - sos heaven.af.mil **
   joe@heaven.af.mil ./Mailbox

Does ~fred/.qmail-sos exist? Yes. "./Extramail".
Write message to ./Extramail in mbox format.

---

[1]Taken from the `PIC.local2ext` file distributed with the qmail source code.

Local to virtual delivery[1]
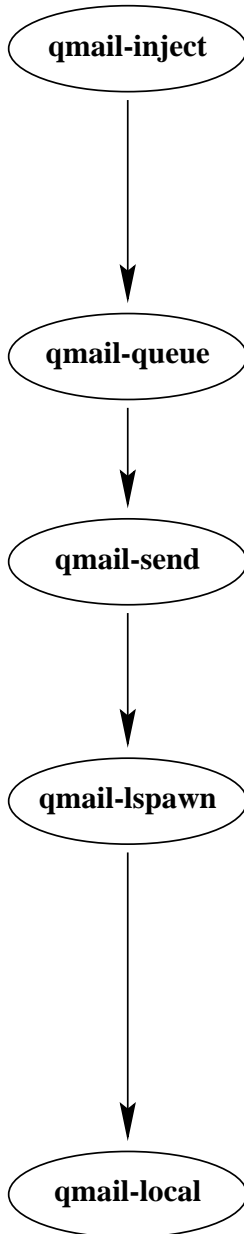
Original message:

> **To: dude@tommy.gov**
> **Hi.**

qmail-inject

Fill in the complete envelope and header:

> **(envelope) from joe@heaven.af.mil **
> **to dude@tommy.gov**
> **From: joe@heaven.af.mil**
> **To: dude@tommy.gov**
>
> **Hi.**

qmail-queue

Store message safely on disk.
Trigger qmail-send.

qmail-send

Look at envelope recipient, dude@tommy.gov.
Is tommy.gov in locals? No.
Is dude@tommy.gov in virtualdomains? No.
Is tommy.gov in virtualdomains? Yes:
** "tommy.gov:fred"**
Deliver locally to fred-dude@tommy.gov.

qmail-lspawn

qmail-lspawn ./Mailbox

Look at mailbox name, fred-dude.
Is fred-dude listed in qmail-users? No.
Is there a fred-dude account? No.
Is there a fred account?Yes.
Is fred's uid nonzero? Yes.
Is ~fred visible to the qmailp user? Yes.
Is ~fred owned by fred? Yes.
Give control of the message to fred.
Run qmail-local.

qmail-local

**qmail-local fred ~fred fred-dude - dude tommy.gov **
** joe@heaven.af.mil ./Mailbox**

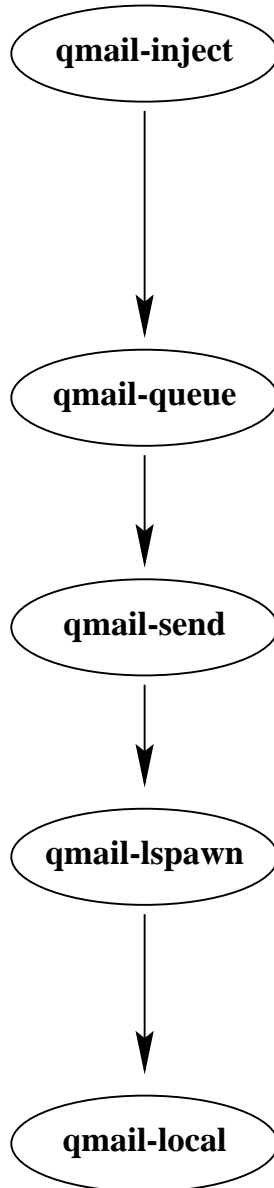**Does ~fred/.qmail-dude exist? No.**
Does ~fred/.qmail-default exist? Yes: "./Mail.tommy".
Write message to ./Mail.tommy in mbox format.

---

[1]Taken from the `PIC.local2virt` file distributed with the qmail source code.

Local to local alias delivery[1]

Original message:

    To: help

    Hi.

qmail-inject

Fill in the complete envelope and header:

    **(envelope) from joe@heaven.af.mil **
        to help@heaven.af.mil
    From: joe@heaven.af.mil
    To: help@heaven.af.mil

    Hi.

qmail-queue

Store message safely on disk.
Trigger qmail-send.

qmail-send

Look at envelope recipient, help@heaven.af.mil.
Is heaven.af.mil in locals? Yes.
Deliver locally to help@heaven.af.mil.

qmail-lspawn

qmail-lspawn ./Mailbox

Look at mailbox name, help.
Is help listed in qmail-users? No.
Is there a help account? No.
Give control of the message to alias.
Run qmail-local.

qmail-local

**qmail-local alias ~alias help - help heaven.af.mil **
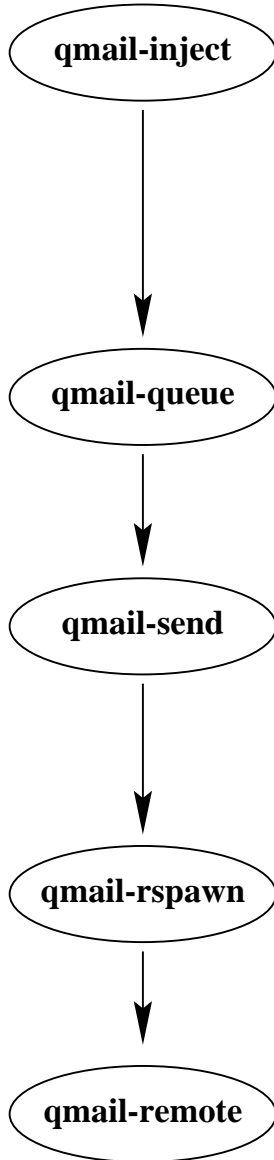   **joe@heaven.af.mil ./Mailbox**

Does ~alias/.qmail-help exist? Yes: "john".
Forward message to john.
(delivery is now a local to local delivery)

---

[1]Taken from the `PIC.local2alias` file distributed with the qmail source code.

Local to remote delivery[1]

Original message:

    To: bill@irs.gov
    Hi.

(**qmail-inject**)   **Fill in the complete envelope and header:**

    **(envelope) from joe@heaven.af.mil **
        to bill@irs.gov
    From: joe@heaven.af.mil
    To: bill@irs.gov

    Hi.

(**qmail-queue**)   **Store message safely on disk.**
    Trigger qmail-send.

(**qmail-send**)   **Look at envelope recipient, bill@irs.gov.**
    Is irs.gov in locals? No.
    Is bill@irs.gov in virtualdomains? No.
    Is irs.gov in virtualdomains? No.
    Is .gov in virtualdomains? No.
    Deliver remotely to bill@irs.gov.

(**qmail-rspawn**)   **Run qmail-remote.**

(**qmail-remote**)   **Look at host name, irs.gov.**
    Is irs.gov listed in smtproutes? No.
    Look up DNS MX/A for irs.gov and
        connect to it by SMTP.

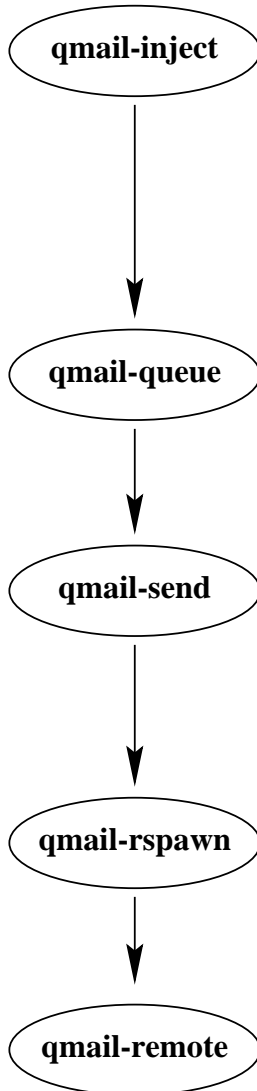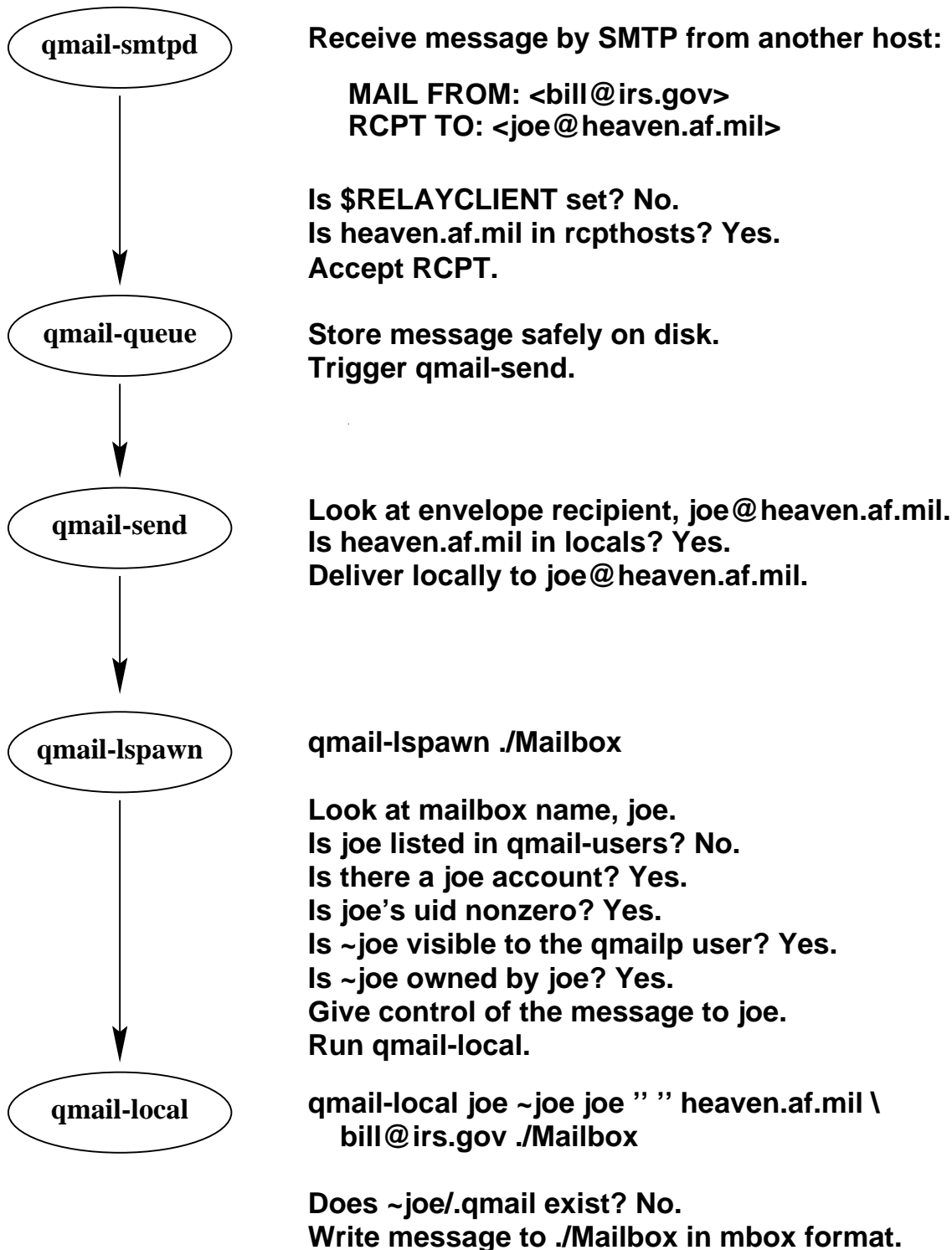   **MAIL FROM: <joe@heaven.af.mil>**
    RCPT TO: <bill@irs.gov>

---

[1]Taken from the `PIC.local2rem` file distributed with the qmail source code.

Null client delivery[1]

Original message:

    To: bill@irs.gov
    Hi.

qmail-inject

Fill in the complete envelope and header:

    **(envelope) from joe@heaven.af.mil **
      to bill@irs.gov
    From: joe@heaven.af.mil
    To: bill@irs.gov

    Hi.

qmail-queue

Store message safely on disk.
Trigger qmail-send.

qmail-send

Look at envelope recipient, bill@irs.gov.
Is irs.gov in locals? No.
Is bill@irs.gov in virtualdomains? No.
Is irs.gov in virtualdomains? No.
Is .gov in virtualdomains? No.
Deliver remotely to bill@irs.gov.

qmail-rspawn

Run qmail-remote.

qmail-remote

Look at host name, irs.gov.
Is irs.gov listed in smtproutes? Yes:
    "bigbang.af.mil".
Look up DNS A for bigbang.af.mil and
    connect to it by SMTP.

    MAIL FROM: <joe@heaven.af.mil>
    RCPT TO: <bill@irs.gov>

---

[1]Taken from the `PIC.nullclient` file distributed with the qmail source code.

Remote to local delivery[1]

qmail-smtpd

Receive message by SMTP from another host:

    MAIL FROM: <bill@irs.gov>
    RCPT TO: <joe@heaven.af.mil>

Is $RELAYCLIENT set? No.
Is heaven.af.mil in rcpthosts? Yes.
Accept RCPT.

qmail-queue

Store message safely on disk.
Trigger qmail-send.

qmail-send

Look at envelope recipient, joe@heaven.af.mil.
Is heaven.af.mil in locals? Yes.
Deliver locally to joe@heaven.af.mil.

qmail-lspawn

qmail-lspawn ./Mailbox

Look at mailbox name, joe.
Is joe listed in qmail-users? No.
Is there a joe account? Yes.
Is joe's uid nonzero? Yes.
Is ~joe visible to the qmailp user? Yes.
Is ~joe owned by joe? Yes.
Give control of the message to joe.
Run qmail-local.

qmail-local

**qmail-local joe ~joe joe '' '' heaven.af.mil **
    bill@irs.gov ./Mailbox

Does ~joe/.qmail exist? No.
Write message to ./Mailbox in mbox format.

---

[1]Taken from the `PIC.rem2local` file distributed with the qmail source code.

Unauthorised relaying[1]

qmail-smtpd

Receive message by SMTP from another host:

    MAIL FROM: <spammer@aol.com>
    RCPT TO: <bill@irs.gov>

Is $RELAYCLIENT set? No.
Is irs.gov in rcpthosts? No.
Reject RCPT.

---

[1]Taken from the `PIC.relaybad` file distributed with the qmail source code.

Authorised relaying[1]

qmail-smtpd

Receive message by SMTP from another host:

    MAIL FROM: <joe@heaven.af.mil>
    RCPT TO: <bill@irs.gov>

Is $RELAYCLIENT set? Yes.
Accept RCPT.

qmail-queue

Store message safely on disk.
Trigger qmail-send.

qmail-send

Look at envelope recipient, bill@irs.gov.
Is irs.gov in locals? No.
Is bill@irs.gov in virtualdomains? No.
Is irs.gov in virtualdomains? No.
Is .gov in virtualdomains? No.
Deliver remotely to bill@irs.gov.

qmail-rspawn

Run qmail-remote.

qmail-remote

Look at host name, irs.gov.
Is irs.gov listed in smtproutes? No.
Look up DNS MX/A for irs.gov and
    connect to it by SMTP.

    MAIL FROM: <joe@heaven.af.mil>
    RCPT TO: <bill@irs.gov>

---

[1]Taken from the `PIC.relaygood` file distributed with the qmail source code.

Independent message retry schedule

Instead of repeatedly retrying every deferred message, each message is given its own independent retry schedule. qmail uses a quadratic retry schedule for each unsuccessfully delivered message. Older messages are retried less often. Local messages are retried more often than remote messages.

Local messages:

$$time\ in\ queue = 100 * delivery\ attempt^2$$

$$delay\ till\ next\ retry = 200 * delivery\ attempt + 100$$

Remote messages:

$$time\ in\ queue = 400 * delivery\ attempt^2$$

$$delay\ till\ next\ retry = 800 * delivery\ attempt + 400$$

Delivery d_0 is the first delivery attempt.

Independent message retry schedule

Quadratic Retry Schedule for qmail−send (remote)

(time in queue = 400 * d^2) (delay time = 800 * d + 400)

Delivery Attempts (d)
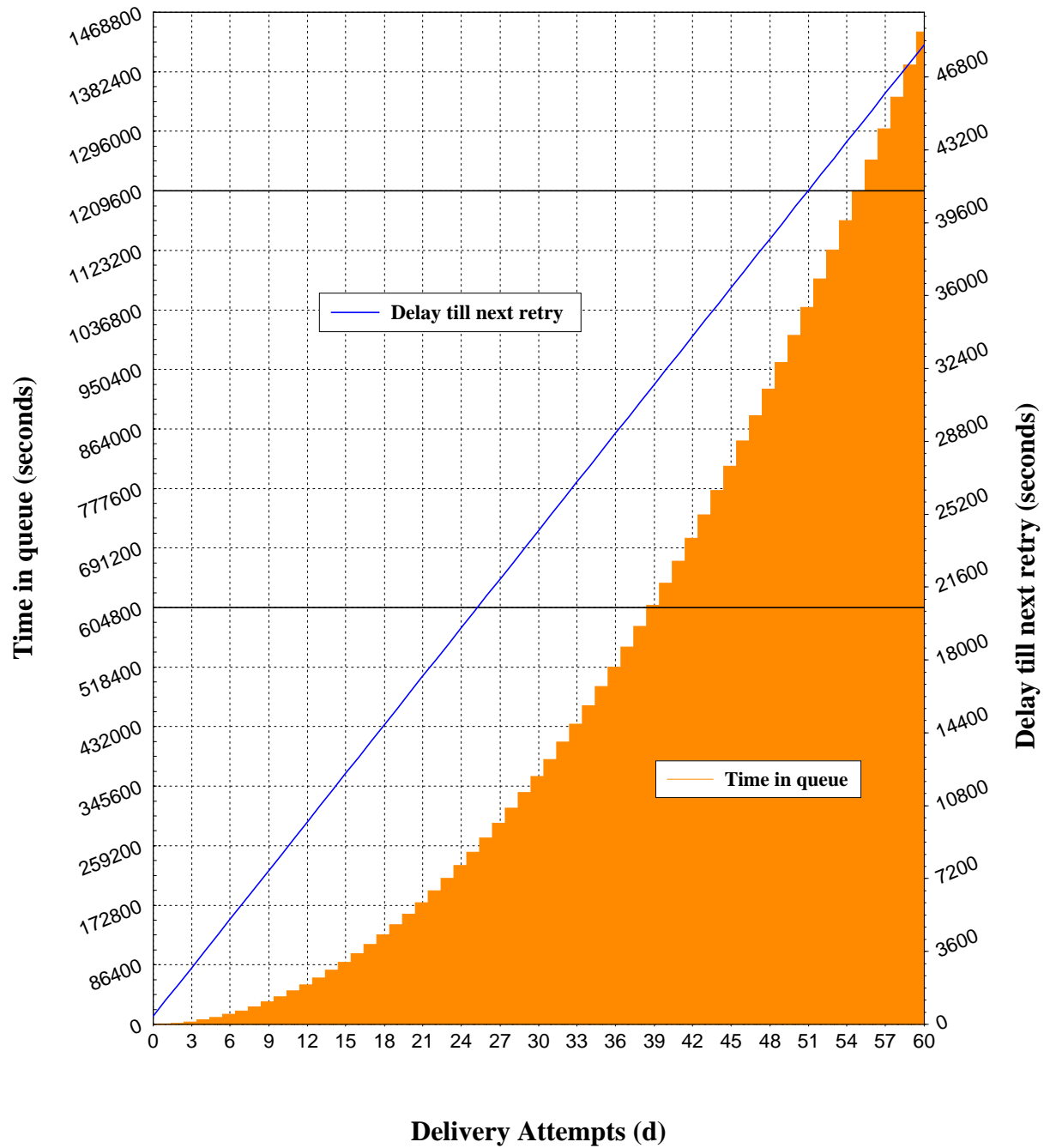
Remote host retry strategy

If a remote host does not respond to two connection attempts (separated by at least two minutes with no intervening successful connections), qmail automatically leaves the host alone for an hour. At the end of the hour it *slow–starts,* allowing one connection through to see whether the host is up.

The IP addresses of these unresponsive hosts are stored in /var/qmail/queue/lock/tcpto. The contents of this binary file can be examined using /var/qmail/bin/qmail–tcpto. The file can be reset using /var/qmail/bin/qmail–tcpok.

Compiling qmail

- down load the qmail source distribution from **http://cr.yp.to/qmail.html** and unpack the distribution

  ```
  gunzip -c qmail-1.03.tar.gz | tar xvf -
  cd qmail-1.03
  ```

- Modify the configuration files as required:

  - ./conf–break — user extension delimiter

  - ./conf–cc — compiler options

  - ./conf–groups — group names

  - ./conf–ld — linker options

  - ./conf–patrn — .qmail permission mask

  - ./conf–qmail — installation directory

  - ./conf–spawn — delivery concurrency limit

  - ./conf–split — number of queue subdirectories

  - ./conf–users — user names

Compiling qmail

- ## create the qmail installation directory

  ```
  mkdir /var/qmail
  ```

- ## Create the qmail users and groups

  ### /etc/passwd

  ```
  alias:*:29990:29998::/var/qmail/alias:/bin/true

  qmaild:*:29991:29998::/var/qmail:/bin/true

  qmaill:*:29992:29998::/var/qmail:/bin/true

  qmailp:*:29993:29998::/var/qmail:/bin/true

  qmailq:*:29994:29997::/var/qmail:/bin/true

  qmailr:*:29995:29997::/var/qmail:/bin/true

  qmails:*:29996:29997::/var/qmail:/bin/true
  ```

  ### /etc/group

  ```
  qmail:*:29997:

  nofiles:*:29998:
  ```

- ## Build and install the binaries

  ```
  make setup check
  ```

Starting qmail

The qmail distribution provides a number of startup examples in /var/qmail/boot/*. The basic mechanism is

```
env - PATH="/var/qmail/bin:$PATH" \
     qmail-start [ aliasempty [ logger arg ... ] ]
```

The *aliasempty* argument is given to qmail–lspawn. It can be a simple mbox filename such as ./Mailbox or a maildir directory name such as ./Maildir/.[1]

The *aliasempty* argument may also be a different delivery program such as /bin/mail or procmail for example.

qmail's activity records are sent through the program specified by the *logger* argument – typically qmail's splogger.

The start up environment is eventually passed to qmail–local so you may need to sanitise the environment before starting qmail.

You may also wish to place limits on qmail's resource usage using appropriate `ulimit(1)` settings.

---

[1] The trailing slash is **vital.** It signifies that the delivery destination is a maildir **directory** rather than an mbox **file** called Maildir.

daemontools

The daemontools package allows you to control startup, shutdown and automated restarting of any number of processes – without needing to know their process ID. See **http://cr.yp.to/daemontools.html.**

svscan watches up to 1000 subdirectories. Each of these subdirectories (which may be symbolic links to other locations) contains a run script that starts a process in the foreground. svscan starts up a supervise process for each of these run scripts. If the process dies, supervise automatically restarts it.

If the directory has the sticky bit set, and it has a subdirectory called log, svscan will create a pipe between the original supervise process and another supervise process which is controlling the log/run script. This allows for controlled log gathering using multilog (or any other logging system you desire).

multilog automatically rotates logs when they reach a given size. The number and size of the logs are configurable. multilog can also filter input lines based on limited regular expressions.

Using daemontools

Create the master service directory /service and start svscan from one of:

- /etc/rc.local

  ```
  /usr/local/bin/svscan /service &
  ```

- /etc/inittab

  - Create a startup script /service/svscan

    ```
    #!/bin/sh
    export PATH=/usr/local/bin:$PATH
    exec /usr/local/bin/svscan /service
    ```

  - add an entry to /etc/inittab

    ```
    sv:2345:respawn:/service/svscan
    ```

  - signal init to re–read /etc/inittab

    ```
    telinit q
    ```

Using daemontools

Create a qmail startup script, /var/qmail/etc/qmail/service/run:

```
#!/bin/sh
exec env - PATH="/var/qmail/bin:$PATH" \
    qmail-start ./Mailbox 2>&1
```

Create a qmail log script, /var/qmail/etc/qmail/service/log/run:

```
#!/bin/sh
exec setuidgid qmaill multilog t /var/log/qmail
```

Toggle the sticky bit on the service directory:

```
chmod +t /var/qmail/etc/qmail/service
```

Make a symbolic link from the master service directory

```
ln -s /var/qmail/etc/qmail/service /service/qmail
```

Within a minute, qmail will be started and all details will be logged in the automatically rotated file /var/log/qmail/current.

Using daemontools

Processes can be stopped using

```
svc -d /service/qmail
```

Processes can be started using

```
svc -u /service/qmail
```

Processes can be restarted using

```
svc -dx /service/qmail
```

To avoid losing any data if there is a supervised log process, svscan will keep the pipe open, even while the supervised process is down.

Migrating from sendmail

By default, qmail will deliver to each user's home directory. If you wish to preserve your /var/spool/mail/user mail boxes, instruct qmail to deliver mail using a different MDA:

```
qmail-start \
    '|preline -f /bin/mail -r \
    "${SENDER:-MAILER-DAEMON}" -d $USER' \
    splogger qmail
```

Examples of different MDA configurations are available in /var/qmail/boot/*.

/etc/aliases **compatibility**

If you don't want to move away from your existing /etc/aliases file you can use the fastforward package.

Create a hash table of alias definitions by running

 /var/qmail/bin/newaliases[1]

If you have `:include` references, create hash tables for each of these include files by running

```
newinclude /path/to/include/file
```

Enable the alias database(s) by creating ~alias/.qmail-default which contains

```
| fastforward -d /etc/aliases.cdb
```

fastforward will automatically read the contents of any `:include` references made in /etc/aliases provided you have run the newinclude command.

fastforward can also be used to maintain separate alias databases for each supported virtual domain.

---

[1] This is the fastforward version of newaliases and is not to be confused with the traditional sendmail version.

Using fastforward

fastforward can also be used to handle any number of aliases instead of using individual .qmail files.

Create a file to hold the alias definitions:

```
all@ourdomain.com:
    staff@ourdomain.com,
    managers@ourdomain.com,
    contractors@ourdomain.com,
;

staff@ourdomain.com: peters, syin, charles;

managers@ourdomain.com:
    jonathan, david, warwick, cindy;

contractors@ourdomain.com: gordonr, suresh, charlie, raoul;
```

Create a constant database file

```
setforward file.cdb file.tmp < file
```

Create an appropriate entry in .qmail–default

```
| fastforward -p file.cdb
| bouncesaying "Sorry, no such address. (#5.1.1)"
```

.forward **compatibility**

If you don't want to move away from your existing .forward files you can use the dot–forward package.

Start qmail by specifying .forward compatibility

```
qmail-start '| dot-forward .forward¹
./Mailbox' splogger qmail
```

If a user has a .forward file, qmail will obey the instructions in that file and no further delivery will take place. If the .forward file does not exist, qmail will deliver to the user's default mail box – specified above as ./Mailbox or follow instructions in the user's .qmail file if it exists.

If you don't wish to provide .forward compatibility to all users, individual users can take advantage of dot–forward by specifying dot–forward delivery in their own .qmail files.

```
| dot-forward .forward
./Mailbox
```

---

[1] The quotes and the newline here are **vital.** The dot–forward delivery instruction is separate from the ./Mailbox delivery instruction.

Using tcpserver

Tcpserver is part of Dan Bernstein's ucspi-tcp package. It is a replacement for inetd and, optionally, tcp_wrappers. It is available from **http://cr.yp.to/ucspi-tcp.html.**

Tcpserver is the preferred mechanism for starting qmail network daemons (and any other **TCP** daemons that might normally be started from inetd).

```
tcpserver [options] host port program [args]
```

Example: Run tcpserver in verbose mode, as user *qmaild,*[1] as group *nofiles,*[2] allow up to 100 simultaneous connections, allow all interfaces to listen for incoming **SMTP** connections:

```
tcpserver -v -u 29991 -g 29998 -c 100 \
    0 smtp /var/qmail/bin/qmail-smtpd 2>&1 \
    | /var/qmail/bin/splogger smtpd 3 &
```

The daemontools package has a utility called envuidgid which sets the value of **$UID** and **$GID** to the user and group ids of the specified user. tcpserver can be told to use these variables with the **–U** option. (This requires the ucspi-tcp package version 0.88 and above).

---

[1]You **must** use the UID number rather than a name.
[2]You **must** use the GID number rather than a name.

Tcpserver can be configured to allow or deny access on an IP basis in a similar fashion to tcp_wrappers.

Create a rules file, one file for each service under the control of tcpserver. /etc/smtp.tcp for example.

```
149.135.128.:allow,RELAYCLIENT=""
127.:allow,RELAYCLIENT=""
149.135.13.:deny
peter@149.135.13.17:allow,RELAYCLIENT=""
:allow,DATABYTES="1048576"
```

Create the rules database

```
tcprules /etc/smtp.cdb /etc/smtp.tmp \
    < /etc/smtp.tcp
```

Example: Run tcpserver in verbose mode, as user *qmaild,* as group *nofiles,* allow up to 100 simultaneous connections, allow all interfaces to listen for incoming **SMTP** connections based on the rules in /etc/smtp.cdb.

```
tcpserver -v -u 29991 -g 29998 \
    -x /etc/smtp.cdb -c 100 0 smtp \
    /var/qmail/bin/qmail-smtpd 2>&1 \
    | /var/qmail/bin/splogger smtpd 3 &
```

Using inetd **instead of** tcpserver[1]

The use of inetd for qmail (and just about everything else) has been deprecated by the qmail community.

One of inetd's most annoying *"features"* is its rate–limited shutdown. If inetd determines that the rate of incoming connections for a particular service is too high, it will stop servicing that port for 10 minutes. Given qmail's parallel delivery mechanism, even a small system can bombard a remote inetd rapidly. I have actually flattened a largish Australian ISP's inetd from a 14k4 modem. They quickly changed to tcpserver. 😃

If you must use inetd, consider an alternative such as xinetd, **http://www.synack.net/xinetd,** or rlinetd, **http://www.rcpt.to/rlinetd.** Neither of these programs suffer from the rate–limited shutdown problem. Both programs have a different configuration syntax to inetd and both provide inbuilt IP access control using the tcp_wrappers library libwrap, unlike inetd which relies on the tcp_wrappers binary program tcpd.

If you're still desperate to use inetd, examples of /etc/inetd.conf configuration entries can be found in the FAQ distributed with the qmail source.

---

[1]Both inetd and tcpserver may be used on the same system, however only one of them can service a particular port at a time.

Address assignment

qmail's alias mechanism does not apply if the user exists. User names can be overridden using the qmail–users mechanism.

The file /var/qmail/users/assign contains details on who should receive mail for each given user name:

```
=local:user:uid:gid:homedir:dash:ext:

+loc:user:uid:gid:homedir:dash:pre:
```

Consider the following example:

```
=ftp:alias:29990:29998:/var/qmail/alias:-:ftp:

+ftp-:alias:29990:29998:/var/qmail/alias:-ftp-::

+ftp:peter:2052:100:/home/peter:-:ftp:
```

Mail addressed to *ftp@domain* will be handled by the *alias* user according to the instructions in ~alias/.qmail–ftp.

Mail addressed to *ftp–something@domain* will be handled by the *alias* user according to the instructions in ~alias/.qmail–ftp–something.

Mail addressed to *ftpstuff@domain* will be handed by *peter* according to the instructions in ~peter/.qmail–ftpstuff.

Address assignment

qmail–pw2u can be used to build an assign file based on a V7 format password file.

```
/var/qmail/bin/qmail-pw2u < /etc/passwd \
    > /var/qmail/users/assign
```

/var/qmail/users/assign must not contain NULL characters. It must also end with a single dot on a line by itself

```
...
=ftp:alias:29990:29998:/var/qmail/alias:-:ftp:
+ftp-:alias:29990:29998:/var/qmail/alias:-ftp-::
+ftp:peter:2052:100:/home/peter:-:ftp:
.
```

qmail–newu **must** be run to create /var/qmail/users/cdb which is used by qmail–lspawn.

Mailing list management

Majordomo version 1.9x needs some modification to work with qmail. Version 2.x should support qmail *"out of the box"*. Version 2.x doesn't have a projected release date and minor modifications to version 1.9x are still being released (1.94.5 was released on 18 January 2000).

Russ Allbery has an excellent FAQ on how to modify majordomo – **http://www.eyrie.org/~eagle/faqs/mjqmail.html.** It contains pointers to a number of patches and auxiliary programs that allow you to continue using majordomo with qmail.

The basic steps involve

- Apply patches to majordomo

- Eliminate majordomo's wrapper program

- Create ~majordomo/.qmail–*list* files

- Change majordomo config files to use *list*–owner instead of owner–*list*

ezmlm – a qmail mailing list manager

ezmlm is specifically tailored for qmail. Features include:

- secure and simple subscribe/unsubscribe mechanism

- automatic message archiving

- open or closed lists

- smart bounce handling using qmail's Variable Envelope Return Path (VERP) to reliably determine the recipient address and message number for every incoming bounce message

- automatic unsubscription after 10 days of bounces

- any user can create an ezmlm list

- customisations available through .qmail files

Creating an ezmlm list

To create a *psamuel–jokes* list

```
ezmlm-make ~/JOKES ~/.qmail-jokes \
    psamuel-jokes my.domain.com
```

Subscribe/unsubscribe requests are sent to

psamuel–jokes–subscribe@my.domain.com
psamuel–jokes–unsubscribe@my.domain.com

Postings are sent to

psamuel–jokes@my.domain.com

List help is sent to

psamuel–jokes–help@my.domain.com

The list owner can be contacted at

psamuel–jokes–owner@my.domain.com

Users send retrieval requests for message **12345** to

psamuel–jokes–get.12345@my.domain.com

Customising an ezmlm list

Disable message archiving

```
mv ~/JOKES/archived ~/JOKES/notarchived
```

Prevent public subscription

```
mv ~/JOKES/public ~/JOKES/notpublic
```

Force a `Reply-To: list` header

```
echo "Reply-To: psamuel-jokes@my.domain.com" \
    >> ~/JOKES/headeradd
```

Allow closed user group subscription

```
touch ~/JOKES/public
```

and then edit ~/.qmail-jokes-default and insert

```
|domaincheck listname domain1 domain2 ...
```

Domaincheck is an executable of your own design that examines **$SENDER** and exits 0 if the sender's domain is in one of the listed valid domains. If the sender is not from one of these domains, domaincheck prints an appropriate message to stdout which will appear in the bounce message. Domaincheck then exits 100 which informs qmail that no further processing is to take place.

Customising an ezmlm list

Further possible customisations include:

- modify ~/JOKES/headerremove to exclude specific headers

- modifying administrative text messages by editing ~/JOKES/text/*

- adding list specific footer messages by modifying ~/.qmail-jokes (all on one line):

  ```
  | cat - /home/psamuel/JOKES/text/footer¹ |
      /pkgs/bin/ezmlm-send '/home/psamuel/JOKES'
  ```

- modifying `Subject:` headers and adding a footer message by modifying ~/.qmail-jokes (all on one line):

  ```
  | subject-prefix² JOKES |
      cat - /home/psamuel/JOKES/text/footer |
      /pkgs/bin/ezmlm-send '/home/psamuel/JOKES'
  ```

- just about anything you can think of to do in a .qmail file

---

[1] footer is a text file of your own making

[2] subject-prefix is a program of your own design that modifies the `Subject:` header of the message

ezmlm–idx

Many of the above customisations to ezmlm (and many others) are available in the third party package ezmlm-idx. See **http://www.ezmlm.org.**

ezmlm-idx is based on ezmlm 0.53. It supports:

- message digests

- remote list administration

- subscriber only posting

- list moderation

- subject prefixing

- specific non–subscriber posting

- web accessible message archiving

- in–place list reconfiguration

- and more

- just about anything you can think of to do in a .qmail file

Tips and troubleshooting

- Did you read **ALL** the man pages and the FAQ?

- Did you search **http://www.qmail.org** ?

- Did you examine the qmail logs?

- If mail is not being delivered, but a burst of deliveries is seen every time you start qmail–send, check your trigger file. Its permissions are quite specific:

  ```
  prw--w--w- 1 qmails qmail 0 Apr 13 14:26
      /var/qmail/queue/lock/trigger
  ```

- If mail is not being delivered to some users, check the permissions on the user's home directories, mailboxes, Maildirs and .qmail files. The qmail log file should mention permission problems. Some programs may hold a lock on the mailbox file, this prevents local delivery.

- You can set up multiple qmail–smtpd programs and switch between them by setting **$PATH** in your tcprules. (Requires tcpserver). Or you can use the twist option if you are using tcp_wrappers.

Tips and troubleshooting

- If you need to move the qmail queue (or it has been trashed), use queue–fix to repair broken inodes, permissions etc. **http://www.netmeridian.com/e-huss/queue–fix.tar.gz**

- Use qmail–lint to check your qmail control files. **http://www.glasswings.com.au/qmail/qmail–lint–0.55**

- Use fixcr to ensure CRLF end of line chars are enforced. Start qmail–smtpd from tcpserver:

```
tcpserver -v -u 29991 -g 29998 \
    -x /etc/smtp.cdb -c 100 \
    0 smtp sh -c 'fixcr \
    |/var/qmail/bin/qmail-smtpd' 2>&1 \
    | /var/qmail/bin/splogger smtpd 3 &
```

- Hide your machine identity using tcprules.

```
149.135.128.11:allow,RELAYCLIENT="",
    TCPREMOTEHOST="mail.tansu.com.au",
    TCPREMOTEIP="192.168.0.1"
:allow
```

This will affect the `Received:` header used by qmail–queue, qmail–qmqpd and qmail–qmtpd.

Tips and troubleshooting

- Broken file permissions in /var/qmail can be restored by running `make setup check` from the source directory.

- If you're having trouble delivering messages to *user@aol.com,* typically error messages of the form `CNAME lookup failed temporarily`, you'll need to patch dns.c from qmail and/or ucspi–tcp. AOL has increased their DNS records beyond 512 bytes. **http://www.ckdhr.com/ckd/qmail–103.patch**

  A simpler patch can also be applied

  ```
  --- dns.c.orig
  +++ dns.c
  @@ -24 +24 @@
  -static union { HEADER hdr; unsigned char
      buf[PACKETSZ]; } response;
  ---
  +static union { HEADER hdr; unsigned char
      buf[1<<15]; } response;
  ```

- Disable **IDENTD** lookups by running tcpserver with the -R option.

- Run qmail–start, tcpserver etc from supervise to ensure they auto restart when necessary. supervise is part of the daemontools package.

Performance tuning tips

- Avoid syslogd. On some operating systems it can inhibit performance with its use of the sync(2) or fsync(3) calls. Use multilog from Dan's daemontools package instead. **http://cr.yp.to/daemontools.html**

- Place /var/qmail in its own file system. If possible, place it on a separate disk and/or controller and take full advantage of available RAID style tools to improve I/O performance.

- Postfix comes with some good performance loading tools, smtp–source and smtp–sink. You can use these to test **SMTP** daemons and MTA systems under various load conditions.

- Run qmail on multiple machines, each with the same MX value.

- Run multiple instances of qmail on the same machine. Each has its own /var/qmail directory, eg /var/qmail, /var/qmail2, etc. Modify conf–qmail and recompile for each instance you wish to support.

  Incoming **SMTP** messages can be directed to a random qmail–smtpd process using a simple wrapper program of your own design called from tcpserver.

Performance tuning tips

- If you need to support many local and/or virtual domains, store the extra domains in the morercpthosts control file, and create the constant database file using qmail-newmrh.

- For systems handling enormous amounts of mail, increase the number of queue directories by editing conf-split before compiling. The default value is 23. Choose a number such that each queue directory contains no more than 1000 files at most.

- Apply the conf–split structure to the todo directory, instead of its default flat structure, by applying the *big–todo* patch. See **http://www.glasswings.com.au/qmail/big-todo.103.patch.**

- Allow the value of concurrencyremote to be increased above 240 by applying the *big-concurrency* patch. See **http://www.glasswings.com.au/qmail/big-concurrency.patch.**

Performance analysis[1]

Internal and External SMTP Connections

Remote Recipients

Successes and Failures

Deliveries and Queued Messages

---
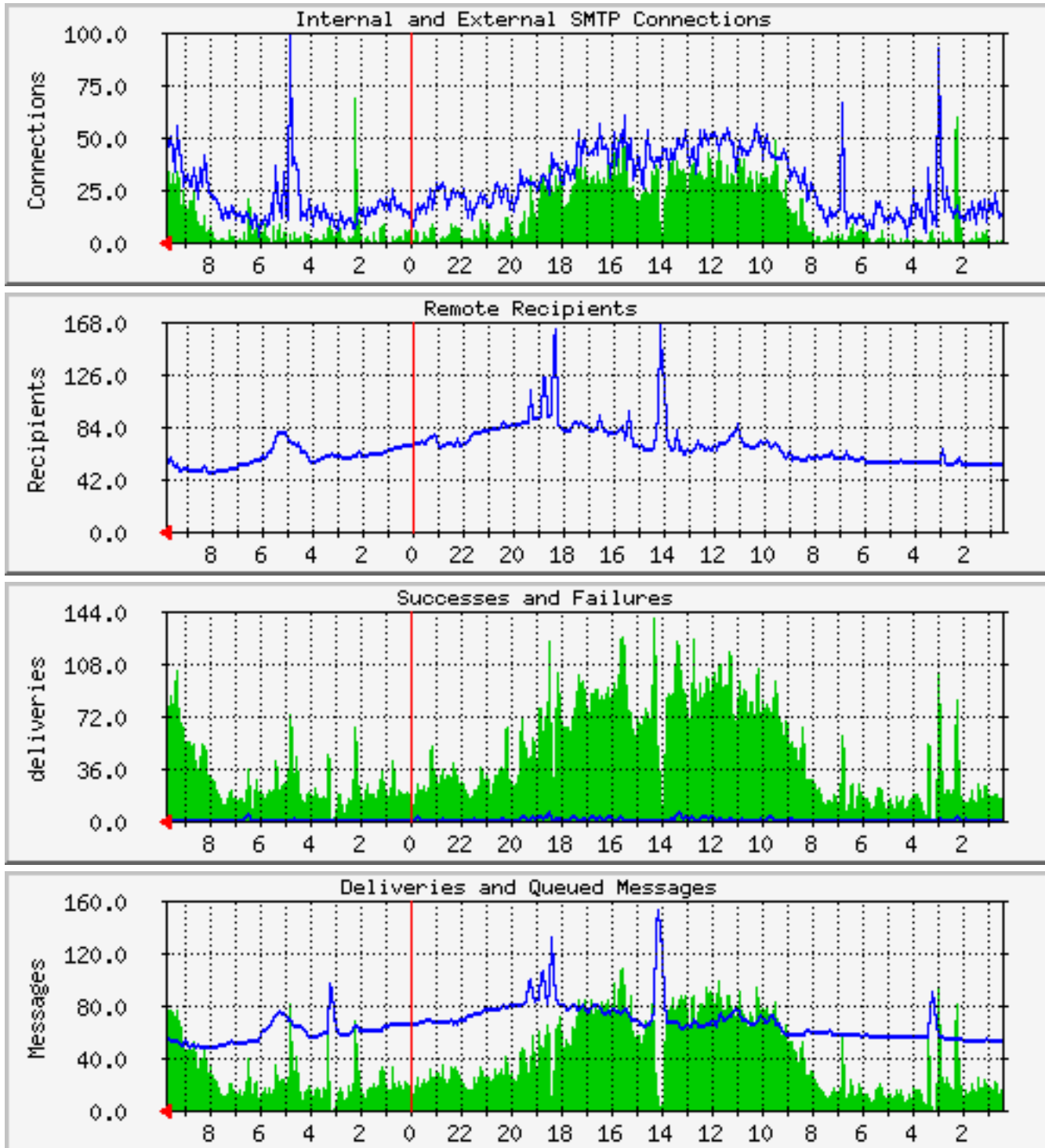
[1]Real data from a corporate mail gateway. Gathered by MRTG after analysing qmail and tcpserver logs.

Performance analysis

- The system handles more **SMTP** connections on its external network interface than its internal network interface.

- Traffic profiles seem to follow core business hours on both interfaces.

- The number of items in the queue remains around 50. This indicates that remote sites are either busy or under powered.

- Just after 2am yesterday, a large number of **SMTP** connections arrived on the internal interface. Around 3am on the same day, an even larger number of **SMTP** connections arrived on the external interface. This lead to a corresponding increase in deliveries at these times.

- The large increase in queued messages, and the corresponding drop in deliveries at 2PM yesterday, indicates all the possible qmail–remote processes were busy with large messages. A similar situation arose at around 6:30PM yesterday and again at around 3am this morning.

Availability and competing products

qmail – version 1.03, (June 1998)

>   **http://www.qmail.org**
>   **http://cr.yp.to/qmail.html**

sendmail – version 8.10.1, (April 2000)

>   **http://www.sendmail.org**

exim – version 3.14, (April 2000)

>   **http://www.exim.org**

smail – version 3.2, (July 1996; beta 111, Feb 2000)

>   **ftp://ftp.uu.net/networking/mail/smail**

zmailer – version 2.2e10, (March 1996)

>   **ftp://ftp.cs.toronto.edu/pub/zmailer**

Postfix – (December 31 1999, patch level 08, May 29 2000)

>   **http://www.postfix.org**

Ancillary software

qmail is distributed with a number of ancillary programs.

qmail–qstat – show the number of queued and pre–processed messages in the queue.

qmail–qread – shows the sender and recipient details and delivery status of all pre–processed messages.

qmail–pop3d – a **POP3** daemon that supports maildir formats. Requires a checkpassword program.

sendmail – wrapper allowing local MUA programs to be used unchanged. They can still compose mail and deliver it via `/usr/lib/sendmail -t`. Calls qmail–inject.

Ancillary software

datemail – similar interface to the sendmail wrapper. Sets `Date:` header in local time instead of GMT for those MUAs that do not set the header. Calls qmail–inject.

preline – inserts a **UUCP** style `From user` header before calling an external program. Preline insists on sending the entire message to stdout. It can be upset by downstream programs, such as some vacation programs, that close stdin before preline has finished with stdout.

forward – forwards mail messages to the specified list of addresses. List can be constructed *"on the fly"*.

And many more.

Additional software

Dan Bernstein, and others, have written a number of other packages that can be used with qmail. Dan's software is available from **http://cr.yp.to/software.html.**

qmailanalog – analyses log files and generates mail statistics.

ezmlm – mailing list manager specifically for qmail. Supports automatic subscription, archiving and retrieval of messages.

checkpassword – required by qmail–pop3d. Originally written by Russ Nelson.

fastforward – sendmail like alias clone for sites that don't wish to move away from /etc/aliases files.

dot–forward – sendmail like .forward clone for sites that don't wish to move away from .forward files.

Additional software

serialmail – allows batch processing of mail transport over slow/intermittent serial links.

rblsmtpd – provides support for excluding mail from sites listed in the *Real Time Blacklist*. It can be used with any SMTP daemon. See **http://maps.vix.com/rbl** for more information on the *Real Time Blacklist*.

VmailMgr – A Virtual mail manager designed to manage multiple domains of mail addresses and mailboxes on a single host. See **http://www.qcc.sk.ca/~bguenter/distrib/vmailmgr** for more details.

qmail–vacation – a vacation package designed to work with qmail. See **ftp://ftp.eserv.com.au/pub/tools/qmail/.**

eliminate–dups – eliminates duplicate messages arriving in your mailbox. See **ftp://ftp.eserv.com.au/pub/tools/qmail/.**

Additional software

There are a host of other third party packages available from the qmail web site – **http://www.qmail.org.**

Extensions to ezmlm.

Patches to provide maildir support for MUAs.

Alternative checkpassword programs.

Smart startup/shutdown wrappers.

HTML versions of the manual pages.

qmail patches for better SPAM blocking etc.

qmail books

At present there are no books dedicated to qmail.

John Levine and Russell Nelson are writing a book. It was to be published in September 1999 by O'Reilly & Associates but that date has slipped. A new publication date has not been officially announced yet. Tim O'Reilly hopes it will be ready by the third or fourth quarter of 2000.

Richard Blum is writing a book called *"Running Qmail"*. It is to be published in September 2000 by SAMS.

Commercial support[1]

Several organisations are willing to provide commercial support for qmail.

Gormand Pty Ltd (Australia) Provides commercial support for qmail.

> **http://www.gormand.com.au**

Crynwr Software. (USA) Support is available on-site, by 800 number, or over the Internet. Crynwr accepts Visa/MC/Amex/purchase orders.

> **http://www.crynwr.com/qmail.html**

Inter7 Internet Technologies, Inc. (USA) Support is available on-site, by 800 number or over the internet. Inter7 accepts purchase orders.

> **http://www.inter7.com/qmail**

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[1]Many of these sites are listed at **http://www.qmail.org**

Commercial support

tummy.com ltd. (USA) provides commercial support for qmail. Available by email, telephone or on site. Accepts Discover, Visa, MC, Amex and purchase orders.

   http://www.tummy.com

Quist Consulting (Canada) Provides commercial support for qmail.

   http://www.quist.on.ca

Virtual Estate Consulting (USA) Provides commercial support for qmail.

   http://www.virtual-estate.net/services.shtml

LIS Consulting, LLC (USA) provides remote, telephone, and email support for all aspects of qmail.

   http://www.lis.net

Comtrends (USA) Provides qmail consulting services. Provides on-site, remote, and phone support and accept purchase orders.

   http://www.comtrends.net

Commercial support

Arcanet Consulting (Italy) an Italian company offering commercial support to Italian people.

> **http://www.arcnetconsulting.com**

2interactive.com (USA) Support for qmail, available on-site, by phone or over the internet. Also accepts credit cardspurchase orders.

> **http://www.2interactive.com**

Advanced Information Services, LLC (USA) offers commercial qmail support. Offers on-site within Delaware, New Jersey, Pennsylvania and Florida and remote support.

> **http://www.o3m.com**

Prodigy Solutions, Inc (USA) is providing Commercial support for qmail and add-ons.

> **http://www.prodigysolutions.com**

Commercial support[1]

Mira Networking. (Australia) Support is available over the Internet and Mira accepts Visa/MC/Amex/Diners.

http://www.mira.net/qmail.html

eServ. Pty Ltd (Australia) Provides commercial support for qmail.

http://www.eserv.com.au

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[1]These companies may still be offering commercial qmail support

The future

Zero administration for null clients. Replace **SMTP** with **QMQP** for communication between null clients and central mail host. A full implementation of **QMQP** ships with qmail version 1.03. Dan plans to release a mini qmail package with **QMQP** support enabled by default.

Faster installation. Provide precompiled packages for popular operating systems.

Split log analysis. Improvements to qmailanalog. The next version will be designed to run periodically, keeping crucial information in a table on disk. qmailanalog-0.70 has some of these features now.

[Speed] Wide–area QMTP support. Use **QMTP** between qmail hosts to cut down on **SMTP** latency. Requires encoding the **QMTP** availability in the hosts MX record. See RFCMXPS and RFCQMTP in the qmail distribution for more details.

The future

[Speed] Asynchronous compressed journaling. Reduce qmail's disk I/O by feeding new mail through a separate journaling process that saves messages in compressed form; `qmail-send` will rebuild the queue from the compressed journal when it starts.

[Speed] Local–host DNS lookups. A future version of qmail will support an alternate, much smaller **DNS** library that talks to a nameserver on the same host. Work has already begun on this project. Dan's dnscache package is a replacement for BIND. It is available from **http://cr.yp.to/dnscache.html.**

Dynamic subscription agents. Why should users have to deal with dozens of different mailing list subscription mechanisms? The new dynasub package will accept subscription requests from local users and negotiate subscriptions with remote mailing lists. It will automatically set up a local sublist for each remote list, to speed delivery and protect user privacy.

Don't ask when qmail–2.0 will be released! Take the *zen* approach and let it happen. 🙂

URLography

Source Code

http://cr.yp.to/qmail.html
ftp://moni.msci.memphis.edu/pub/qmail/
– qmail RPMS
http://www.qmail.org/
– more RPM references

Help

http://www.qmail.org/
http://cr.yp.to/qmail/faq.html
http://Web.InfoAve.Net/~dsill/lwq.html
http://qmail-docs.surfdirect.com.au/
http://www.flounder.net/qmail/qmail-howto.html
http://www.tibus.net/pgregg/projects/
http://savage.iut-blagnac.fr/projets/doc/qmail/v0.4/
http://www.palomine.net/qmail/relaying.html
http://www.eyrie.org/~eagle/faqs/mjqmail.html
– qmail with majordomo FAQ
http://www.i2k.net/~dougvw/mailqueue.html

qmail Mailing List Archives

http://www.archive.ornl.gov:8000/
– searchable
http://www.egroups.com/list/djb-qmail?refstop=1
http://msgs.securepoint.com/qmail/

Other Mailing List Details

http://cr.yp.to/lists.html

qmail–subscribe@list.cr.yp.to

cdb–subscribe@list.cr.yp.to

ezmlm–subscribe@list.cr.yp.to

password–subscribe@list.cr.yp.to

qmailannounce–subscribe@list.cr.yp.to

serialmail–subscribe@list.cr.yp.to

Ancillary software

http://cr.yp.to/software.html

http://cr.yp.to/checkpwd.html

http://cr.yp.to/dot-forward.html

http://cr.yp.to/ezmlm.html

http://cr.yp.to/fastforward.html

http://cr.yp.to/mess822.html

http://cr.yp.to/qmailanalog.html

http://cr.yp.to/serialmail.html

http://cr.yp.to/ucspi-tcp.html

URLography

Third Party Ancillary Software

http://www.qmail.org/
- loads of references

http://www.ezmlm.org/
- ezmlm with loads of extras

http://www.tibus.net/pgregg/projects/
- another checkpassword program

ftp://ftp.eserv.com.au/pub/tools/qmail/eliminate–dups–1.2.tar.gz

ftp://ftp.eserv.com.au/pub/tools/qmail/qmail–vacation–1.3.tar.gz

http://www.netmeridian.com/e–huss/queue–fix.tar.gz

http://www.glasswings.com.au/qmail/qmail–lint–0.55

http://www.glasswings.com.au/qmail/qmail–qsanity–0.52

http://www.qcc.sk.ca/~bguenter/distrib/vmailmgr
- multiple virtual domain manager

http://www.nrg4u.com/
- qmail with **LDAP** support, *Big Picture* home page

http://http://www.inter7.com/qmailadmin/

http://www.obtuse.com/smtpd.html
- alternate **SMTP** daemon

http://www.io.com/~mick/soft/qmhandle.html

http://www.qmail.org/qmLogsort

ftp://ftp.win.tue.nl/pub/security/
- home of tcp_wrappers

http://ee-staff.ethz.ch/~oetiker/webtools/mrtg/mrtg.html

URLography

Anti SPAM

http://maps.vix.com/rbl/

http://www.orbs.org/

http://www.obtuse.com/smtpd.html

http://spam.abuse.net/spam/

Other MTAs

http://www.exim.org/

http://www.postfix.org/

http://www.sendmail.org/

ftp://ftp.uu.net/networking/mail/smail/

ftp://ftp.cs.toronto.edu/pub/zmailer/

Patches

http://www.qmail.org/

– loads of references

http://www.ckdhr.com/ckd/qmail–103.patch

– one implementation of the AOL dns.c patch

URLography

Web Based Mail Interfaces[1]

http://mikael.mnf.nu/webmail/
http://netwinsite.com/dmailweb/
http://thunder.dorm.duke.edu/zeus/index.html
http://web.horde.org/imp/
http://web.nwe.ufl.edu/+AH4-northrup/hypermail.html
http://webmail.woanders.de/
http://www.atdot.org/
http://www.emumail.com/
http://www.endymion.com/
http://www.inter7.com/sqwebmail/
http://www.landfield.com/hypermail/
http://www.lugs.ch/LUGS+AF8-Members/norbert.kuemin/wmf.html
http://www.mailspinner.com/
http://www.netwinsite.com/
http://www.webmin.com/webmin/
http://www.woanders.de/~wastl/webmail/

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[1]These may or may not work with qmail.

URLography

Commercial Support

http://www.gormand.com.au

http://www.crynwr.com/qmail.html

http://www.inter7.com/qmail

http://www.tummy.com

http://www.quist.on.ca

http://www.virtual-estate.net/services.shtml

http://www.lis.net

http://www.comtrends.net

http://www.arcnetconsulting.com

http://www.2interactive.com

http://www.o3m.com

http://www.prodigysolutions.com

http://www.mira.net/qmail.html

http://www.eserv.com.au