

Replacing your MTA with qmail

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Introduction

Nearly every Unix based operating system that ships with a mail transport agent, ships with sendmail. Sendmail has been the defacto standard in MTA's for years. Until the last handful of years, there were few options; if you wanted to send and receive email, you used sendmail. Over the years, sendmail gained a reputation as being insecure. It was large and monolithic, and often operated with excessive privileges. This led to a wide variety of vulnerabilities being found in sendmail. Sendmail security has improved dramatically in recent history, but its still based on the original design.

One of the first, and certainly most viable sendmail replacements that was designed with security in mind was qmail, by Dan Bernstein. Functional components were designed and written to perform specific tasks needed of an MTA. This resulted in a modular design which runs with as little privilege as possible for each of its tasks. Due to the care taken in design, qmail is also easy to set up and administer.

In this article, we'll discuss installing qmail as a mail transport agent. We'll use some of the tools Dan Bernstein has also written, to improve both security and performance.

• Building and Installing qmail

1. Download qmail

qmail is available for download at <ftp://koobera.math.uic.edu/www/software/qmail-1.03.tar.gz>. Mirror sites are listed at <http://cr.yo.to/qmail.html>. Its best to check <http://cr.yo.to/qmail.html> before downloading, to ensure you obtain the latest version. As of writing, 1.03 is the latest, and was released in June of 1998. Upon download, it should be gunzip'd and de-tarred.

```
# ncftpget -F ftp://koobera.math.uic.edu/www/software/qmail-1.03.tar.gz
qmail-1.03.tar.gz:                220668 bytes    21.15 kB/s
# gunzip -c qmail-1.03.tar.gz |tar xf -
# ls -dF qmail-1.03
qmail-1.03/
#
```

2. Build qmail

People unfamiliar with qmail often complain that it is difficult to install. While it doesn't follow what some are used to for building, its actually simpler than most pieces of software to build and install. We'll go step by step through actually building it on a system. However, the included build and testing instructions included in the distribution itself are great; they're terse, but if you follow them, there should be no problems.

o Step 1: Add Users and Groups

qmail runs under a number of different user accounts. These accounts need to be added, and placed in

their own groups.

```
# export PATH=$PATH:/usr/sbin
# useradd -g nofiles -d /var/qmail/alias alias
# useradd -g nofiles -d /var/qmail qmaild
# useradd -g nofiles -d /var/qmail qmail1
# useradd -g nofiles -d /var/qmail qmailp
# groupadd qmail
# useradd -g qmail -d /var/qmail qmailq
# useradd -g qmail -d /var/qmail qmailr
# useradd -g qmail -d /var/qmail qmails
#
```

o Step 2: Build qmail

qmail builds cleanly on most Unix systems without the need for autoconf or other complex configuration tool. To build and install it, one simply uses make.

```
# make setup check
<output from build removed>
# ls -l /var/qmail
total 8
drwxr-sr-x   2 alias   qmail   1024 Sep  8 16:00 alias
drwxr-xr-x   2 root    qmail   1024 Sep  8 16:24 bin
drwxr-xr-x   2 root    qmail   1024 Sep  8 16:24 boot
drwxr-xr-x   2 root    qmail   1024 Sep  8 16:24 control
drwxr-xr-x   2 root    qmail   1024 Sep  8 16:24 doc
drwxr-xr-x  10 root    qmail   1024 Sep  8 16:24 man
drwxr-x---  11 qmailq  qmail   1024 Sep  8 16:24 queue
drwxr-xr-x   2 root    qmail   1024 Sep  8 16:24 users
#
```

o Step 3: Configure qmail

Configuring qmail is fairly easy for a basic installation. The `config` script built as part of the build process will perform most of the setup for qmail. Simply run the script, and it will go and fetch the DNS information needed to configure qmail. It will place all of its configuration files in `/var/qmail/control`.

```
# cd /var/qmail/control
# ls -l
total 5
-rw-r--r--   1 root    root           9 Sep  8 17:01 defaultdomain
-rw-r--r--   1 root    root          45 Sep  8 17:01 locals
-rw-r--r--   1 root    root          12 Sep  8 17:01 me
```

```

-rw-r--r--    1 root    root          9 Sep  8 17:01 plusdomain
-rw-r--r--    1 root    root        33 Sep  8 17:02 rcpthosts

# more defaultdomain
internal

```

The `defaultdomain` file contains the domain to tag on to any address which does not contain a '.' in it. As the domain used on my internal network is 'internal', all outbound mail destined within the domain will have this tagged on it.

```

# cat locals
mail.internal
internal
localhost

```

The `locals` file contains a list of destinations that exists on this machine.

```

# cat me
mail.internal

```

`me` contains the fully qualified domain name of the host qmail is being installed on.

```

# cat plusdomain
internal

```

The `plusdomain` file contains the domain name to tack on to destination hosts ending with a plus sign.

```

# cat rcpthosts
mail.internal
localhost
internal
internal

```

`rcpthosts` contains a list of all the domains to accept mail for.

If `dns` isn't available for some reason, you can also run `config-fast your.full.host.name`. This will populate the files listed above with information based on the full hostname.

o Step 4: Additional features

Masquerading can be achieved by placing the domain to masquerade as in `/var/qmail/control/defaulthost`

Virtual domains can be created by creating a `virtualdomains` file in `/var/qmail/control`. Virtual domains are lists, one to a line, with the format `domain:username`. All mail destined to the domain will be delivered to the specified username.

- **Step 5: Install aliases**

Aliasing is achieved in a very different way than it is under sendmail. Aliases are defined in individual files for the alias, in the `/var/qmail/alias` directory. The installation of aliases is described in the `INSTALL.alias` file. As from the `INSTALL` file, a basic set of aliases can be installed as follows.

```
# (cd ~alias; touch .qmail-postmaster .qmail-mailer-daemon .qmail-root)
# chmod 644 ~alias/.qmail*
```

This will result in the alias account being the destination for these accounts. This mail will reside in `/var/qmail/alias/Mailbox`.

- **Step 6: Set up delivery**

In most cases, its safe to use the mbox format for delivery -- its what users are used to, and will work with most mailers by default. Read the `INSTALL.mbox`, `INSTALL.vsm` and `INSTALL.maildir` files, and decide which format is best for you. They will give information about how to configure the delivery scheme.

Next, an rc file needs to be put in to place for qmail to start qmail with he properly delivery system. Typically, this will require moving `/var/qmail/boot/home` to `/var/qmail/rc`.

- **Step 7: Testing and final installation**

The testing documents for qmail are contained in `TEST.deliver` and `TEST.receive`. Run the tests listed in each of these files. Once successful, you'll need to remove sendmail, and create a link from the location sendmail was to `/var/qmail/bin/sendmail`. The location of sendmail varies from system to system; typical locations are `/usr/lib/sendmail` and `/usr/sbin/sendmail`. If this is a preexisting mail system, its important to read the `REMOVE.sendmail` and `REMOVE.binmail` files, to ensure that mail delivery is as uninterrupted as possible.

Once in place, the listed daemon for qmail will need to be installed in `inetd`. It is possible to use alternate listening mechanisms, such as `tcpserver`, from Dan Bernstein's [ucpsi](#) package. Its much more efficient, reliable and flexible than `inetd`.

```
# cat >> /etc/inetd.conf
smtp stream tcp nowait qmaild /var/qmail/bin/tcp-env tcp-env /var/qmail/
bin/qmail-smtpd
```

qmail can be started by hand by running `csch -cf '/var/qmail/rc &'`. This should be added to the startup scripts appropriate to your installation.

- **Additional information.**

A tremendous amount of information is included with the qmail distribution. If you'd prefer to read this material online, it can be found at <http://www.qmail.org/man/index.html>. A good deal of information about qmail in general, its installation, packages that work with it, and so on, is

available at <http://www.qmail.org/>. Dan Bernstein's qmail page is available at <http://cr.yp.to/qmail.html>.

. Conclusion

qmail is radically different from sendmail, the more common email solution installed on Unix systems. Built with security in mind, qmail overcomes many of the problems and concerns that people have with sendmail. Since it was released, there has been no major security issues with the core components of qmail; all problems found have been related to add-on programs that failed to live up to the requirements of interoperating securely with qmail. By taking a modular approach, and running with the lowest possible privileges, qmail is able to markedly improve the security stance of machines it is installed on. Unlike many security related packages, however, it is easy to build, install and configure. With qmail being as easy to use as it is, there are few reasons more people shouldn't be running it.

Relevant Links

[qmail homepage](#)

[Dan Bernstein](#)

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