How to Configure Sendmail

This How To covers the process of configuring email handling after registering a domain. Sendmail is the Unix/Linux software that does email handling. It's not a Mail User Agent (MUA) like the email programs you'd recognize. It is just a...

Method 1 of 6:

Download Sendmail

1. **Download Sendmail[1].** You may be automatically offered a short initial message which will indicate the current release. These instructions below assume version 8.10.0 or later.
2. **Build and install Sendmail for your machine.** In most cases, this consists of unpacking the distribution, reading the README and sendmail/README files, and typing Build in the Sendmail directory. See the INSTALL file in the distribution's top-level directory for details.

Method 2 of 6:

Set up Sendmail

1. **Understand that Sendmail uses information from the Domain Name System (DNS) to figure out which IP addresses go with which mailboxes.**
2. **Choose an available domain name.** In our example, we will use **yourdomain.com**.
3. **Configure your DNS on the server.** Establish two machines as primary and secondary name servers for your domain. Knowledge of how to do this is assumed; otherwise, read the O'Reilly book "DNS and BIND", 4th Edition is highly recommended. Familiarize yourself with BIND before continuing.
4. **Configure MX records for your domain (Note:** CNAME records can not be used; see § 5.2.2 of RFC 1123 for details.) MX records are explained in the O'Reilly Sendmail book; the 2nd edition gives an overview in § 15.3 and describes how to configure them in § 21.3, whereas the third edition explains everything about them in § 9.3. You have two options for MX records:
5. **Determine your connection method:**
    1. If the mail server which will serve your new domain has a full-time connection to the Internet, it should be the primary MX host for your domain. In this configuration, your MX records would look like this:

        1. yourdomain.com. IN MX 10 yourmailserver.yourdomain.com.
    2. Otherwise, you will need to find another machine to queue mail for your domain when you are not connected. Be sure to get the machine owners' approval first. That machine must be configured to allow relaying to your domain. If it is running Sendmail, this can be as simple as adding your domain to the `relay-domains` file on that machine. You would then point your MX records at

that machine. For example:
3. yourdomain.com. IN MX 10 yourmailserver.yourdomain.com.
4. yourdomain.com. IN MX 20 othermailserver.otherdomain.com.

6. **Now the name servers are setup, register your domain using one of the registries.** As you register, inform the registry of the two name servers, and then the domain will point to your server.

Method 3 of 6:

Configure Sendmail

1. **Read the `cf/README` file thoroughly.** It will give you instructions on creating a `.mc` file in the `cf/cf` directory. Your `mailserver.mc` file will typically look something like:
    1. divert(-1)dnl
    2. #
    3. # This file contains the global definitions for yourdomain.com
    4. #
    5. divert(0)dnl
    6. VERSIONID(`@(#)mailserver.mc 1.0 (yourdomain.com) 5/1/97')
    7. OSTYPE(solaris2)dnl
    8. DOMAIN(yourdomain.com)dnl
    9. FEATURE(`virtusertable', `dbm /etc/mail/virtusertable')dnl
    10. MAILER(local)dnl
    11. MAILER(smtp)dnl

    12. Your actual OS will be substituted for solaris2.

2. **A typical `cf/domain/yourdomain.com.m4` file that looks something like:**

    1. divert(-1)dnl
    2. #
    3. # This file contains the global definitions for yourdomain.com
    4. #
    5. divert(0)dnl
    6. VERSIONID(`@(#)yourdomain.com.m4 1.0 (yourdomain.com) 5/1/97')
    7. FEATURE(`use_cw_file')dnl

3. **It may have some other `feature()`'s and `define()`'s as well.** The virtual user table is the key to all of this.
4. **Generate your `/etc/mail/sendmail.cf` file from your `mailserver.mc` file, so type:**
    1. cd sendmail-VERSION/cf/cf
    2. /Build mailserver.cf
    3. cp mailserver.cf /etc/mail/sendmail.cf

5. **Create the virtual user table.** This is explained in detail in the Sendmail book: § 19.6.28 of the 2nd edition, or § 4.8.51 of the 3rd edition; an overview is given here. The table is a database that maps virtual addresses into real addresses. You create a text file where each line has a key/value pair, separated by a TAB. For example:
    1. Example 1:
        1. joe@yourdomain.com jschmoe
        2. jane@yourdomain.com jdoe@othercompany.com
        3. @yourdomain.com jschmoe
            1. In this first example, the address `joe@yourdomain.com` will be mapped to the local user `jschmoe`; `jane@yourdomain.com` will be mapped to the remote user `jdoe@othercompany.com`, and anything else coming in to `yourdomain.com` will also go to `jschmoe`.

    2. Example 2:
        1. joe@yourdomain.com jschmoe%3
        2. bogus@yourdomain.com &npsp; error:nouser No such user here
        3. list@yourdomain.com yourdomain-list
        4. @yourdomain.com %1@othercompany.com
            1. In this second example, the address `joe@yourdomain.com` will be mapped to the local user `jschmoe%3` (see note 3 below for an explanation of what the %3 means), the address `bogus@yourdomain.com` will return the indicated error, the address `list@yourdomain.com` will be mapped to the local user `yourdomain-list` (which you would use the aliases file to ultimately resolve) and every other user at `yourdomain.com` will be mapped to a remote user of the same name at `othercompany.com`.
6. **If you have a local user, say sam, and there is no key for sam@yourdomain.com and no catch-all key for @yourdomain.com, then `Sendmail` will fall back to the local user sam when resolving `sam@yourdomain.com`.** To prevent this, you must use either a catch-all key or an explicit key for `sam@yourdomain.com`; the `error:nouser` example above may be useful in this instance.
7. **If you want a virtual address to resolve to more than one real address, you need to do it indirectly.** Have the virtual address resolve to a local alias, then have the local alias resolve to the desired set of addresses. For example, in the virtual user table:

    1. joe@yourdomain.com localjoe

        then in the aliases file:
    2. localjoe: joe@othercompany.com, jane@othercompany.com
    3. In the above example:
        1. joe@yourdomain.com jschmoe%3
8. **The `%3` is the preservation of the optional `+detail` part of the original address.** In general, +detail means that when `Sendmail` gets an address like `user+detail@domain`, then if domain is in class w (see step 7 below), `sendmail` checks to see if `user+detail` can be resolved, then falls back to just plain user if not. Thus all of:
    1. joe@yourdomain.com
    2. joe+foo@yourdomain.com
    3. joe+reallylongextrapart@yourdomain.com

would all match the above entry, with `%3` preserving the `+detail` part of nothing, `+foo` and `+reallylongextrapart` respectively.

4. Multiple domains are allowed, and virtual addresses in each domain are independent. So for example, you could have:
    1. joe@yourdomain1.com localjoe
    2. joe@yourdomain2.com joe@othercompany.com
    3. joe@yourdomain3.com localjoe
    4. joe@yourdomain4.com error:nouser No such user here

9. **For people administering multiple domains, it may be easier to keep each domain's list in a separate file, then write a short script to concatenate all such files together into a master virtual user table.** But we're getting ahead of ourselves; that's the next step...

Method 4 of 6:

Build the `Sendmail` User Table

1. **Build the virtual user table.** If the above virtual user table text file is located at `sourcefile`, and you are using the **DBM database** type, then use the command:
    1. makemap dbm /etc/mail/virtusertable sourcefile
    2. Note: if you built `Sendmail` with `NEWDB` instead of `NDBM`, then use hash instead of dbm in the above line.
    3. This creates one or more non-text files (typically `/etc/mail/virtusertable.dir` and `/etc/mail/virtusertable.pag`, or `/etc/mail/virtusertable.db`), but does not actually change `/etc/mail/virtusertable` itself, so this is the recommended location for `sourcefile`.
    4. If you would like to reverse-map local users for out-bound mail, you will need to add support for the generics table to your `.mc` file:
        1. FEATURE(`genericstable', `dbm /etc/mail/genericstable')dnl
        2. GENERICS_DOMAIN_FILE(`/etc/mail/generics-domains')dnl
    5. And you will need to create `/etc/mail/genericstable` which is like `/etc/mail/virtusertable` above except the columns are reversed:
        1. jschmoe joe@yourdomain.com

Method 5 of 6:

Add your domain names to `Sendmail`

1. **Add each new domain name to `sendmail`'s class `w`.** This is typically done by adding a line to `/etc/mail/local-host-names` (known as `/etc/sendmail.cw` prior to version 8.10) with the value of each domain name. Likewise, if you are using the `genericstable`, you should add any domains you wish to reverse-map to `/etc/mail/generics-domains`.
2. **Restart or `SIGHUP sendmail`.**

3. **You do not need to restart `sendmail` when changing the virtual user or generics tables, only when changing `/etc/mail/sendmail.cf` or class files such as `/etc/mail/local-host-names`.**

1. An extra step is required for hosts not connected full-time. As noted in the MX configuration section, if you use another host to queue your mail until you connect, you will have to force delivery of mail queued on the secondary mail server. To accomplish this, when your primary server connects, you should run the script `etrn.pl` which comes in the `contrib` directory of the `sendmail` distribution:
    1. etrn.pl secondary-mx-host yourdomain.com
    2. It may be advisable to put this at the end of the `Sendmail` start-up script on any primary `MX`. It would be especially useful as a follow-up to whatever script initiates the connection on primary `MX`s without full-time connections.
    3. At this point, you should be set, and people should be able to send e-mail to addresses `@yourdomain.com`.

Method 6 of 6:

Test your configuration file

1. **Test your configuration and make sure everything works as expected before announcing the new domain name and mail addresses for that domain.** If things don't work as expected, you can test with `Sendmail`'s test mode:
    1. sendmail -bt
    2. Here are some examples of things to try in test mode (make sure the domain is in class w:):
        1. $=w
        2. # is the map working?
        3. /map virtuser joe@yourdomain.com
        4. /map virtuser jane@yourdomain.com
        5. /map virtuser @yourdomain.com
        6. is the rewriting working? #** ,0 joe@yourdomain.com #** ,0 some@yourdomain.com