ELECTRONIC NOTIFICATION HOWTO

You probably receive and send your ordinary email via the mail agent associated with your web browser or by logging into a University of Washington Unix system such as homer.u.washington.edu and running **pine**. There is another type of mail which is important for anyone who writes operational software and would like to have their programs or scripts send email to interested parties in case something extraordinary occurs. This document explains how to set up electronic notification email for a RedHat Enterprise Linux, Version 3, system, and provides some examples of how to use it.

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A Few Examples

Let us start with a simple example.

```
if ! mkdir dog; then
    echo "Could not make dog" | mail -s "Dog creation failed" alan
fi
```

This script attempts to create a new directory named `dog`. If it fails, a mail message is sent to the user with name alan. Because the recipient address is just a username, the mail will not be sent out over the Internet. Instead, it will simply be sent the the user's mail file on the local machine. If user alan has one or more shell windows open, the shell will notify him that he has received new mail the next time that he enters any command on the command-line. This is often all that is needed.

The script could just as well have sent the notification to the user's Internet email address:

```
if ! mkdir dog; then
    echo "Could not make dog" | mail -s "Dog creation failed" afw@u.washington.edu
fi
```

If the examples above were run from the command line, the email notification would normally not be required. On the other hand, the scripts could be run automatically at some predetermined time by the **cron** daemon.

In fact, it is sometimes useful to utilize **cron** simply to send reminder messages. For example, the following line inserted into a `crontab` table would generate a reminder to change the backup tape in the tape drive every Friday at 3:00 PM:

```
0 15 * * 5   echo "Change the backup tape now!" | mail -s "Change tape" alan
```

System Administration

The configuration of the **sendmail** mail transfer agent is enormously complex. Fortunately this process has been made much simpler by the use of configuration macros. We will make one small change to the arguments to one of these macros.

Sendmail Configuration Changes

We need to install the files that will let us change the **sendmail** configuration.

1. Download the *sendmail_cf* package.

   At the site rhn.redhat.com[1], you will be presented with a pop-up dialog box that requests that you sign in. The username is *alanwesthagen*. If you do not know the password, get it from the manager of the Software Team.

   Once you have signed in, click on the **Software** tab in the line of tabs to the right of the RedHat logo at the top of the page.

   On the next page, click on the link to your version of RHEL: **RedHat Enterprise Linux WS (V.3 for X86)**.

   Click the **packages** link.

   In the **Filter by Name** field, type *sendmail*, then click **Go**.

   Finally, click the check box beside **sendmail_cf-...** and proceed to download the package.

2. Install the package.

   Become the root user, provide the password when asked, and run the **rpm** command:

   ```
   cd
   tar xvf rhn-packages.tar
   su
   cd rhn-packages
   rpm -Uhv *
   ```

3. Edit the macro file, `sendmail.mc` process it with M4.

   In a shell window, as root, make a backup copy of `sendmail.mc`:

   ```
   cd /etc/mail
   cp sendmail.mc sendmail.mc.bak
   ```

   Next edit `sendmail.mc`, using your favorite editor. Replace the line

   ```
   dnl define('SMART_HOST','smtp.your.provider')
   ```

   with the line

   ```
   dnl define('SMART_HOST','smtp.washington.edu')
   ```

   and then run **m4** to process the macros:

   ```
   m4 sendmail.mc > sendmail.cf
   ```

4. Restart sendmail and insure that it starts automatically each time the system boots.

   In a shell window, as root:

   ```
   /etc/rc.d/init.d/sendmail restart
   /sbin/chkconfig --level 2345 sendmail on
   ```

TCP Wrappers Configuration

TCP Wrappers is one of several layers of security which protect a Linux computer from malevolent attack via the Internet. In order to use **sendmail** for sending notifications, we have to open up security so that at least our own workstation can receive messages from itself.

On the Internet, the computer that we are logged into has several aliases:

- An alias host name: localhost
- An alias IP address: 127.0.0.1.

We will now add the alias IP address to the list of hosts that are allowed to communicate with our machine. First we make a copy of the file that we are about to change, by putting it under the control of RCS:

```
cd /etc
ci -l hosts.allow
```

Using our favorite text editor, we add the following line to the file `/etc/hosts.allow`

```
ALL: 127.0.0.1
```

then use the **rcsdiff** command to verify the result.

Testing the Results

You can test the results by sending yourself or anyone else an email message from the command line. For example:

```
echo "a message" | mail -s "a subject line" afw@u.washington.edu
```

Notifications from Cron

The **cron** batch scheduling daemon does not run from your desktop and is not attached to any terminal or shell window. If you have **cron** run a command which writes output to *standard output* or *standard error*, there will be no place for the output to go unless you add redirection to the command. Without redirection, **cron** will send the output to your email in-box. If you allow this to happen, your in-box will get very large, very quickly.

If you do not care to ever see the output of a command run from cron, simply redirect all of the output to the null file. The following example shows a way (no longer the best way) to set your computer's Internal clock from a time standard via the Internet. In this case, you do not care to receive email each night telling you that your clock has been adjusted. The command redirects standard output to `/dev/null` and then redirects file descriptor 2, which is standard error, onto file descriptor 1, which is standard input, so that both of these streams are taken care of. (If this seems a bit esoteric, you are right. Just remember the pattern. It works.)

```
30 22 * * * rdate -s bigben.cac.washington.edu > /dev/null 2>&1
```

You usually do not want your **cron** jobs to run in complete silence. This example will send you mail telling of success or failure.

Here is a script to use tar to backup the home directory of a user called alan who wants to be notified of success or failure at his emails address *afw@u.washington.edu*:

```
if tar cf home.tgz /home/alan > /dev/null > 2>&1 ; then
    echo "Tar was successful" -s | mail -s "Tar succeeded" afw@u.washington.edu
else
    echo "Tar had problems"   -s | mail -s "Tar failed"    afw@u.washington.edu
fi
```

The following addition to `crontab` will cause **cron** to run the backup script, `/home/alan/bin/shell/backup`, once a week at 3:15 AM on Sunday:

```
15 3 * * 7 /home/alan/bin/shell/backup
```

Notes

1. https://rhn.redhat.com