HoneyDanBer UUCP Conversion and Maintenance

Marke Clinger

marke@solbourne.com

Revision 1.3

This tutorial explains the concepts and files behind
HDB UUCP and how to convert from Pre-4.1
UUCP to 4.1 Honey DanBer UUCP.

1.0 Introduction

This document gives step-by-step instructions for upgrading BSD UUCP, pre-4.1, to Honey DanBer UUCP, post-4.1. References to the OS/MP 4.1 System Administration Manual will be made to reduce redundant information (this section is included in this document). The same information may also be found in the Sun's System Administration Manual. This document also has a detailed explanation with examples of the major features of HDB UUCP. The tutorial presents one way to upgrade and setup HDB UUCP. HDB UUCP allows many options and variables to be changed. This tutorial offers a simple straightforward way to get UUCP back up and running basically the same way it was before the upgrade. The difference being, that when you are finished you will be running HDB UUCP.

2.0 Assumptions

It is assumed that the system was running at least OS/MP 4.0C (SunOS 4.0 or greater equivalence) and that it is a Solbourne or a SunOS compatible computer. This means that the configuration files for UUCP are in /etc/uucp and the scripts for running UUCP are in /usr/lib/uucp. It is also assumed that the person performing the upgrade knows how to create tapes, upgrade operating systems, and knows how to use basic UNIX commands. The final assumption is that all of the UUCP connections where working properly before this upgrade to 4.1.

3.0 Overview

This section presents an overview of the process to upgrade to HDB UUCP. This is not meant to be followed unless you are very familiar with UUCP. Detailed explanations of each step follow in later sections.

- Before starting the installation of OS/MP 4.1, make a copy of all of the UUCP-related files. Include in this not only setup files, but also spool files and the /etc/passwd entries.
- Be sure to install the UUCP optional software during the installation phase of the server machine.
- After installing OS/MP 4.1 on your system, restore modem functionality. This is covered in Section 11.4 of the System and Network Administration Manual.
- Once the system has been booted with OS/MP 4.1, restore the UUCP files back to the system. After this has been completed you will have the spool and setup files from both pre- and post-4.1 UUCP. Be sure that the UUCP password file entries have been put back into the /etc/passwd file and that the uid is unique for each site and the gid is 8.
- Create an alias for the account uucp to be directed to the person or persons who manage uucp at your site. The standard password file has a uucp user in it. Make sure that it is password protected and that it does not have "/usr/lib/uucp/uucico" as it login shell.
- Copy the old L.sys file to the end of the new Systems file. The Systems file replaced L.sys. (these and the rest of the files discussed are in /etc/uucp).
- If you have Telebit modems, change the third field on each line of the Systems file to "TELEBIT". If you have hayes-compatible modems, change the third field to "HAYES". This field is the device type.
- Copy the old L-devices file to the end of Devices. There are now several definitions for Telebit modems. These need to be defined in each line (this is covered in detail in later sections).
- Create a Permissions file using the script supplied in Appendix A.
- Create a Poll file to specify what time to call each site.
- Set up the crontab file to run the UUCP scripts (details later).
- Run "/usr/lib/uucp/Cvt" to convert old UUCP mail waiting for delivery to the new format.
- Check out the new installation to make sure each site is still reachable and that transfers work correctly.

4.0 Specific Step-by-Step Instructions

This section has specific step-by-step instructions for converting to HDB UUCP. An administrator should be able to follow these step-by-step. Although HDB provides a high degree of configurability, this document only covers those options needed to get the same functionality that was available under the previous version of UUCP with Telebit and Hayes modems.

4.1 Saving Old Files

All the spool files, configuration files, and the password file must be saved. Even if you have done a full dump on your system prior to the upgrade it is still a good idea to create a second tape with the UUCP specific information on it. Use the commands below to do this. Note that before doing the tar you need to make a copy of the password file. The copy will actually be put onto the tape to avoid overwriting the 4.1 original when you tar the files back onto the system.

```
systemname# cd /
systemname# cp /etc/passwd /etc/passwd.40D
systemname# tar cvf /dev/<device> ./etc/passwd.40D ./etc/uucp ./usr/spool/
uucp
```

Replace <device> with the tape device on the system.

4.2 Things to Note During the Installation

The UUCP installation option must be set to “yes” in order for the UUCP files to get installed on the system.

4.3 After 4.1 is Installed

- Before starting the UUCP installation you need to get your modems back into operation. Section 11.4 of the System Administration Manual contains instructions for adding a modem to your computer system.
- Verify that modems are fully function, that you can call out and receive calls.
- Set up a mail alias for the account “uucp” to go the person or persons who maintain uucp at your site.

4.4 First Step - Bringing in the old files

- After installing OS/MP 4.1, boot the machine in single user mode.
- Tar the UUCP files (or restore from a dump tape) back onto the system.

4.5 Set up the Password Entries

Move all of the UUCP login entries from /etc/passwd.40D into the /etc/passwd file. Verify that each of these have a unique user id and a group id of 8.

4.6 Convert old UUCP files to new format

4.6.1 L.sys to Systems

Append the /etc/uucp/L.sys file to the end of the /etc/uucp/Systems file. This is done easiest with cat.

```
# cat L.sys >> Systems
```

Note that in this and the following procedures you should append the information to the end of the existing files. These files have important information and examples in them that will be useful.

Further work is needed on this file and is covered in section 4.6.3.

4.6.2 L-devices to Devices

Append the L-devices to the end of the Devices using the method shown above.

Note: The old ACU dialer will no longer work properly with certain modems. You must pick one of the modem types from the file Dialers. In our case we will give examples of Telebit and Hayes Modems.

There is now a specification for Telebit modems. If you are using a Telebit modem you can change the first field, called the type field, to “TELEBIT”. You should also change the fifth field, the dialer field, to one of tbfast, tb2400, or tb1200. Each modem should have three entries.

Example: You have a Telebit modem connected to the device cua0. Your Devices entry for this modem should look like:

```
TELEBIT cua0 cua0 9600 tbfast
TELEBIT cua0 cua0 2400 tb2400
TELEBIT cua0 cua0 1200 tb1200
```

Example: This allows the modem to dial out at 1200, 2400, and 9600 baud rates. It also allows the modem to go into PEP if the remote modem supports it.

In the case of a hayes compatible modem, the entry looks like:

```
HAYES cua0 cua0 2400 hayes
HAYES cua0 cua0 1200 hayes
```

In both examples it is assumed that the modem is connected to /dev/cua0. If your modem is connected to another device, replace the cua0 with that device name (i.e. ttyd0).

4.6.3 Modify Systems to Match New Dialer Specifications

The third field in the Systems file needs to be modified to specify the same dialer as is now set in Devices. This field might read “ACU” currently. If you have a Telebit modem and made the changes as recommended in the previous section, then change the field to “TELEBIT”. If your modem type is hayes, then change this to “HAYES”.

4.6.4 Build Permissions File

The next file that needs to be set up is “/etc/uucp/Permissions”. If you have not changed L.cmds or USERFILE in your old UUCP setup, you can use the script ”build_uucp_perms” as is (see Appendix A). This script builds a file called “/etc/uucp/Permissions_autobld”. This file must be copied to “/etc/uucp/Permissions” to take effect.

If you have made changes then you need to edit this script. Line 18 contains the information from L.cmds. If this is different from your L.cmds, then add or remove the commands that are missing or extra to this line. Lines 21 and 22 contain the information from USERFILE. The information in the script is the default information. If you have special cases for certain sites you should add them to the Permissions file later for those sites only.

4.6.5 Set up the Polling file

The file "/etc/uucp/Poll" replaces the functionality of the scripts "uucp.day, hour, etc". A new shell script called "uudemon.poll" is responsible for scheduling sites to be called based on the information in the Poll file. Sites that you specifically want to Poll should be specified in this file with appropriate polling times.

The first field is the machine name, followed by a <TAB>, followed by a space separated list of times to call.

Example: A "Poll" file to call bldrsci, blister, boots, and candy might look like:

```
bldrsci     2 4 6 8 10 12 14 16 18 20 22 0
blister     6 8 10 12 14
boots       2 4 6 8 10 12 14 16 18 20 22 0
candy       7 11 18 21
```

See Appendix B for information on how to determine how often and at what time to poll a site.

4.7 Verify the New Installation

4.7.1 Verify Permissions file with uucheck

After you have built and put in place the Permissions file, run the command "/usr/lib/uucp/uucheck". This will report any errors found in the Permissions file. Next run the command again with the -v option and redirect the output to a file. This will give a more readable listing of what the Permissions file says. Review this to make sure things are set up the way you would like to see them. If there is a problem with the way these are setup or if you receive errors from the command, see Section 5.0 of this document or Section 21 of the System Administration Manual for detailed explanations of this file.

4.7.2 Verify file and directory modes for correctness.

Verify that the permissions and ownerships of the UUCP database files and directories are as listed in Section 21.21.5 of the System Administration Manual.

4.8 Convert currently spooled UUCP mail

Run the spool directory conversion program "/usr/lib/uucp/Cvt". This will convert all the old UUCP mail in /usr/spool/uucp to the new format. It will create the necessary directories and put the mail into the correct formats and locations.

4.9 Finished! - Reboot Multi-User

You are finished with the installation. At this point you can reboot to multi-user. Before doing so comment out the invocation of uusched in /etc/rc.local. This will prevent the system from calling sites before you have had a chance to check out the installation.

4.10 Checking out the New Installation

The command “/usr/lib/uucp/Uutry” replaces “/usr/lib/uucp/uupoll”. To force a polling to the remote site, type “/usr/lib/uucp/Uutry <sitename>”. If it reports that it is too soon to call, then use the -r flag to remove the status file.

It is recommended that you attempt to connect to each site in your Systems file. Minor tweaking of the chat scripts may be necessary, but usually all previous settings will work.

4.11 Final Notes

Once you have verified that all sites can be called and that mail can flow between your site and the rest of the world, uncomment “uusched” from /etc/rc.local and run the command. Using “crontab -e uucp” put a variation of the following into the uucp crontab. These shell scripts are explained later in the text. Below are the recommended number of times to run these. In the detailed section on these scripts information is presented on how often these should be run and some criteria for deciding how often. The times below are taken directly from the System Administration Manual.

```
48 8,12,16 * * *        /etc/uucp/uudemon.admin
45 23 * * *             /etc/uucp/uudemon.cleanup
0 * * * *               /etc/uucp/uudemon.poll
11,41 * * * *           /etc/uucp/uudemon.hour
```

These lines will create cron jobs to do periodic maintenance on UUCP automatically.

5.0 Examples and Explanations

This section provides explanations and examples of the HDB UUCP. Basic operation and related files are explained in more detail than in previous sections of this document. Emphasis is on getting UUCP up and running with a modem. HDB UUCP provides expanded UUCP facilities. If you are interested in these facilities see section 21 of the System Administration Manual.

5.1 Systems

The /etc/uucp/Systems file, which corresponds to the old “L.sys” file, contains the information needed by the uucico daemon to establish a UUCP connection to a remote computer. There is at least one line per computer to be called that describes a way to get to that system and how to log in when a connection has been made. If there are several ways to call a remote system, each of those can be put onto a different line. The uucico daemon will try each of them, in the order they appear in the file, until a connection has been established or all variances have been tried.

The specific format of the Systems file is described in Section 21.8. Table 21-3 shows detailed explanations of each field. Here is a standard line which could be used to call the machine stan:

```
stan Any TELEBIT 9600 OUT6784795 ““ \d\d ogin:-\d\r-ogin: uutest word: runtest word: runtest
```

The first field is the name of the machine to call - stan.

The second field is the time. “Any” means anytime. The only other option that is commonly used is “Never”, which means to never call this system. (Note: The specification “Never” does not work in this release and will be fixed in later releases.) This is used when the remote site is down for an extended period of time or if it only calls you. This option actually does not work as you would expect. uucico will still try to call the site, so be sure to remove the rest of the line so that it will fail. These can be broken down into finer granularity. With an optional subfield you can specify which types of traffic to send, when. All UUCP requests are separated by grade. This will allow you to send news traffic in the evening and mail messages at anytime.

The third field is the “type” field. This specifies the device type to use. You will notice that we use “TELEBIT”. This entry is matched against the first field in the “Devices” file.

The fourth field is the “Class” or speed at which to dial the remote site. Typical values for this are 1200, 2400, 9600. This entry will be matched against the fourth field in the Devices file. If you often have trouble connecting to a site at one speed you might want to add a second line that specifies an alternate speed. Then if uucico can not connect at the first speed it will try the second speed.

The fifth field, Phone, has two parts: ” OUT” and the phone number. “OUT” is defined in Dialcodes to be 9. This is needed if you must dial a 9 to get an outside number. We use this function in case this changes in the future. If it does we only have to change one line in one file, instead of all of the UUCP entries in Systems. This can also be used to send other information to the modem before dialing. See Section 21.8, page 666 for more information. The second part is the phone number of the site we want to call.

The sixth field is the “Login” field. This is a series of fields and subfields of the format:

```
expect send
```

where expect is the string that is received from the modem and send is the string that is sent when the expect is received. This is often referred to as the “chat” script.

In our example we do not expect any initial characters from the remote system. This is designated by (“”) (null string). Then we send two delays (2 seconds each) then wait for a login prompt. If we get the login prompt we would then send the login name “uutest. Notice though how the “ogin:” is followed by a dash (-). This dash means “if I didn't get what I expected try again before continuing". So if we don't get the login prompt then we send a 2-second delay and then a carriage-return and wait for the login prompt again.

One of two things will happen at this point, we will get what we expected or we won't. If we do not, the connection is terminated and uucico will try again later. If we do we continue with the chat script. Next we expect a password prompt. When we get it we send the password "runtest". Stan requires two passwords so we then wait for a second password prompt. When we receive it we send the second password "runtest". The hardest part of the connection has now been made. uucico will start the data transfer now.

After the chat script has successfully logged into the system, uucico will begin to transfer files. A complete list of chat script and other options can be found in Section 21.8.

5.2 Permissions

The Permissions file defines the level of access that is granted to computers when they attempt to transfer files or remotely execute commands via uucp. The Permissions file has many different features for setting up different levels of security. In this document we will only discuss those that are needed to restore functionality similar to the previous release of UUCP. These are login access, remote command execution, request and receive directory access.

The file format consists of a logical line with physical lines terminated by a "\" to indicate continuation. The following line must begin with a tab, otherwise it will not be recognized as a continuation line and will be treated as a new entry. Each option, a name/value pair in the format "name=value", as delimited by white space. Some values are colon-separated lists, while others are single words. Comment lines begin with "#". Blank lines are ignored.

We are now going to build a complete Permissions file entry for the host stan. The machine we will be giving access to will be blister.

- LOGNAME and MACHINE

  In our simple case we are going to combine the two types of Permission file entries into one. This means that each logical line will have a "LOGNAME" and "MACHINE" entries. LOGNAME is the name that the remote host logs in as, in our case ublister, while MACHINE is the actual hostname of the remote computer. Using this method both of these must be exactly as specified in the Permissions file when the host logs in or access will be denied.

  The entry this far looks like:

  ```
  LOGNAME=ublister \
  		MACHINE=blister
  ```

  Note that their is a space before the "\". This space is very important and UUCP will not operate properly without it.

- VALIDATE

  This option verifies the remote system is who it says it is. It is an extra level of security beyond the normal password protection scheme. It is optional, but recommended if you want extra security.

  Now our entry reads:

  ```
  LOGNAME=ublister \
               MACHINE=blister \
               VALIDATE=blister
  ```

- COMMANDS

  The next option we are concerned with is “COMMANDS”. This option tells uucico which commands may be executed on your system. This option should be used with care since security can be compromised if too much access is given to the remote computer. In our example we are going to allow the commands rmail, rnews, and uusend to be executed by remote hosts.

  Our entry will now look like:

  ```
  LOGNAME=ublister \
               MACHINE=blister \
               VALIDATE=blister \
               COMMANDS=rnews:rmail:uusend
  ```

  Note that the default search path for uucico is /bin and /usr/bin. Therefore, if the full pathname is not specified on the COMMANDS option line, then the commands specified must be in one of those two directories. If they are not, then you must specify the full pathname to the file.

- SENDFILES

  Specifies whether your computer can send the work queued for the remote computer or not. Typically this is set to yes.

  Now our entry looks like:

  ```
  LOGNAME=ublister \
               MACHINE=blister \
               VALIDATE=blister \
               COMMANDS=rnews:rmail:uusend \
               SENDFILES=yes
  ```

  NOTE: When allowing remote systems to send files to your system, make sure you follow all of the security measures listed in this document. This includes unique uids and the use of the VALIDATE option in combination with LOGNAME and MACHINE.

- REQUEST

This option specifies whether the remote computer has permission to initiate file transfers from your computer. The default value is no, but we will set it to yes for our operation.

Our nearly complete entry now looks like:

```
LOGNAME=ublister \
                MACHINE=blister \
                VALIDATE=blister \
                COMMANDS=rnews:rmail:uusend \
                SENDFILES=yes \
                REQUEST=yes
```

- READ and WRITE

These options specify which directories the remote system is allowed to either read or write to. If these are set to “/” (the root directory) any file on the system that uucp has access to will be readable or writable by a remote system. This is usually not a good idea. The default is to allow access to “/var/spool/uucppublic”. In our example we are going to allow this directory as well as /var/spool/uucp to be accessible. These directory specifications are going to be colon-separated as were those used in the COMMAND option.

Our entry, now complete, looks like:

```
LOGNAME=ublister \
                MACHINE=blister \
                VALIDATE=blister \
                COMMANDS=rnews:rmail:uusend \
                SENDFILES=yes \
                REQUEST=yes \
                READ=/var/spool/uucppublic:/usr/spool/uucppublic \
                WRITE=/var/spool/uucppublic:/usr/spool/uucppublic
```

Note that you do not have to have the READ and WRITE options be exactly the same. Also note that the final line does not have a “\” at the end. This is because the “\” signals a line continuation. Our line is now finished and there is no need to continue. We also explicitly specified /var/spool/uucppublic even though it is the default. In this type of entry, colon-separated, the default is overwritten once the option has been defined in the Permissions file.

- Output from “uucheck -v”

As stated earlier, you should always run uucheck after changing the Permissions file to make sure that there are no errors in the file. uucheck -v tells you how the file will be interpreted. This will verify that the access is actually what you intended it to be. When we run uucheck -v on the above entry we get the following output.

```
When a system logs in as: (ublister)
 We DO allow them to request files.
```

We WILL send files queued for them on this call.
They can send files to
/usr/spool/uucppublic
/var/spool/uucppublic
They can request files from
/usr/spool/uucppublic
/var/spool/uucppublic
Myname for the conversation will be stan.
PUBDIR for the conversation will be /usr/spool/uucppublic.

- Comments

  As stated previously, this is one way to configure a Permissions file. It requires an entry for every machine that you call or that calls you. You are encouraged, once you have basic functionality restored, to experiment with these and other options that are part of the Permissions file until you find the optimum configuration for each of your uucp sites. The above specification will restore the functionality at a security level similar to that of pre-HDB UUCP. You will most likely want to take advantage of the greater level of security provided by HDB UUCP. See Section 21.10 of the System Administration Manual for more information on options for the Permissions file.

5.3 Dialcodes

In the phone field in the Systems file we used a Dialcodes entry of “OUT”. This is defined in the file Dialcodes as follows:

```
OUT 9
```

With this defined, whenever uucico sees “OUT” in the Systems file, it will be replaced by “9”.

An extremely helpful diagram of how all of the UUCP database files interrelate can be found in Section 21.9.

5.4 Devices

The Devices file contains the information about what devices can be used to establish a connection to a remote computer using uucico.

For example:

```
TELEBIT cua0 cua0 9600 tbfast
TELEBIT cua0 cua0 2400 tb2400
TELEBIT cua0 cua0 1200 tb1200
```

This is the definition for the first modem, cua0, on the machine stan.

The first field is the name used in the Systems file to denote modem type. When uucico comes across this entry in the Systems file it looks it up in this file to find out specifically what to do.

The second field tells uucico what device to use. This is the cua device which the modem is attached to and will need to match how your local system is set up.

In our simple example, the third field is a place holder. We just put the device type in again. In some cases this field is the entry in the directory /dev for the dial device.

The fourth field is the speed or “Class” of the modem. This is used when uucico looks up the modem type to find which entry in this file to use.

This fifth and last entry is the dialer to use. uucico uses this field to look up the dialer specification in the Dialers file. A more detailed explanation of the dialers file can be found in a later section of this document.

These three entries need to be set up for each of the modems attached to the system.

5.5 Dialers

The file /etc/uucp/Dialers contains specific information on how to use the modem specified. Hayes and Telebit modems have both been set up by default in this file. A brief explanation of the “tbfast” line will be provided here for general information. Since our modems support the UUCP protocol “g” if register S111 is set to 30, we must modify the three entries for Telebit Modems. These are tb1200, tb2400, and tbfast. The following is the standard entry in the Dialers file for tbfast.

```
tbfast =W-, ““ \dA\pA\pA\pTE1V1X1Q0S2=255S12=255S50=255\r\c OK\r
\EATDT\T\r\c CONNECT\sFAST
```

The most important thing to note here is that several registers are set on the modem and the connect code is specified. If your modems are configured in accordance to Appendix C of this document, then you will have to add an instruction to set up support for the “g” protocol. To do this add “S111=30” after the “S50=???”. The new entry will look like:

```
tbfast =W-, ““ \dA\pA\pA\pTE1V1X1Q0S2=255S12=255S50=255S111=30\r\c
OK\r \EATDT\T\r\c CONNECT\sFAST
```

Do this for all three Telebit entries.

Special Note: Modems, Telebit or Hayes-Compatible, are configured for either numeric or ASCII result codes. Result codes are the information passed back to the host. These codes can be either ASCII or numeric. An ASCII result code would be “OK”, where a numeric result code would be “0” (which means “OK”). UUCP and TIP, as distributed by Solbourne, understand both. Solbourne’s version of UUCP and tip understand both ASCII and numeric result codes, whereas those distributed with Sun only understand numeric. Solbourne’s binaries also have 19,200 capabilities built in. It is recommended, if you are using the Solbourne binaries, that you set your modem to return ASCII result codes.

5.6 Poll

The file /etc/uucp/Poll contains information for polling remote computers. Each site that you call should have a one line entry in this file which defines what times to poll this site. Each entry contains the remote computer name, followed by a <tab> character, and the hours the computer should be called. An example of this is:

```
bldrsci        2 4 6 8 10 12 14 16 18 20 22 0
```

bldrsci is a local site (one city away from stan) that is called every two hours. See Appendix B for more information on how to set up polling times.

5.7 remote.unknown

This program executes when a machine is not in the Systems file starts a conversation with your machine. It will log the conversation attempt and fail to make a connection. This will give you a log of any systems that try to contact you without being setup to do so. There are two reasons for this to occur, a site that should be defined in the Systems file and is not, and a remote system trying to gain illegal access to your system.

5.8 Maxuuxqts and Maxuuscheds

These files, both in /etc/uucp, define the maximum number of uuxqt and uusched programs that can be run at once. These default to 2. These usually do not need to be changed. If your system has more than two modems and spare CPU cycles it would facilitate UUCP transfers to increase these numbers.

5.9 uudemon.admin

This shell script sends uucp status information about the work, data, and execute files to the uucp administrator. It is recommended that it be run from crontab at least one time a day. The System Administration Manual recommends three times per day. The UUCP traffic at your site will determine the number of times it needs to be run and when. The philosophy that we use here is to run it before the business day begins, during lunch, and just before the end of the business day. This allows us to catch problems first thing in the morning and anything that comes up during the day, with a clean running system before leaving for the day. The information provided can be used by the administrator to keep track of the current state of UUCP on his system. The second function this script serves is to check for password problems.

The summary includes information about each site in the following format:

```
bldrsci   15C(6)  02/18-19:56 CALLER SCRIPT FAILED Retry: 6:23 Count: 20
boots     1C      02/19-11:47 LOGIN FAILED Count: 2
cadzooks  1C      02/19-12:22 WRONG TIME TO CALL
candy     2C      02/19-11:12 SUCCESSFUL
```

The site bldrsci has failed due to the error “caller script failed”. It has tried 20 times to gain a connection (Count: 20). There are 15 jobs outstanding.

Calls to the site boots has failed twice during the login phase. There is 1 job outstanding.

An attempt to call the site cadzooks was attempted at a non-valid time.

The last call to the site candy was successful.

The administrator should pay special attention to the age of the oldest job in the queue, number of failed attempts to contact a remote site, and the reasons for failure. These will signal when action should be taken.

5.10 uudemon.cleanup

This shell script performs a number of cleanup activities. Below is a list of the activities with an explanation of what is actually done. This script can be run daily, weekly, or monthly depending on uucp load. It is run daily on stan. Much of what this script does is to give the uucp administrator a set of mail messages that summarize the activities of uucp on that system. This allows the administrator to monitor uucp without looking at the log files.

1. Create Old-Log files

   This portion of the script combines the information in the ".Log" logfiles (uucico, uucp, uux, and uuxqt directories) into a single file Old-Log1. The previous Old-Log1 becomes Old-Log-2. The default is to keep two of these files around. Opinions vary as to how many of these to keep, from 2 to 30 (each file represents a day). To change the number of files that are keep, change the for statement (line 51 as distributed by Solbourne/Sun) in the /etc/uucp/uudemon.cleanup script. Add the number of days in decreasing order (e.g. "for i in 7 6 5 4 3 2 1" will keep the previous 7 days logfiles).

2. Runs uucleanup

   uucleanup will scan the spool directories for old files and take appropriate action to remove them in a useful way. The following options are used and explain the way things are dealt with.

   - -D7 - Remote any D. files that are at least 7 days old and attempt to deliver mail messages and execute rnews when appropriate.
   - -C7 - Remove any C. files that are at least 7 days old and send appropriate information to the requestor.
   - -X2 - Remove any X. files that are at least 2 days old. The D. files are probably not present otherwise the X. would get executed. If their are any D. files present, then the D processing will take care of them.
   - -o2 - Delete other files that are more than 2 days old.
   - -W1 - Send mail message to the requestor warning about the delay in contacting the remote system for any C. files that are 1 day old. The message includes the JOBID, and in the case of mail, the mail message.

3. Cleans up directories in spool area

   Files that are not normal uucp spool or log files are removed from "/usr/spool/uucp" and the subdirectories of this directory.

4. Find corefiles and send list to "uucp"

   A find for core files in "/usr/spool/uucp" is run with a list of them sent to the "uucp" account to be dealt with by the uucp administrator for the system.

5. Clean up the log directories

Cleans up the files and directories within the log directory structure.

6. Mail daily summary of statistics

   Creates a summary of statistics about uucp on the system and mails it to the uucp administrator. The following is a list of the reports that are generated and mailed.

   - UUCP Requests

     A listing of all uucp program requests. The information is useful to see who and what is being transferred between your system and other systems.

     i.e.:

     halk bldrsci bldrsciN4a96 (2/20-10:31:48,13891,0) REQUEST (stan!/c/css/util/simm_address/simm --> bldrsci!~uucp (halk))

   - UUCP Denied

     Any uucp request that was denied for any reason is listed here. This information is useful in two ways. When you first convert to HDB UUCP you can see where people uucp information to/from. This information can be used to educate the users as to the appropriate place to uucp to/from or to loosen up the restrictions. See Section 5.6 on the Permissions file for more on this.

     i.e.:

     usoleast usoleast (1/3-20:38:16,24732,0) REMOTE REQUESTED (stan!/etc/passwd --> usoleast!/var/spool/uucppublic/passwd.stan (root))

     In this example the user root was attempting to transfer the file from /etc/passwd from the machine stan to the machine soleast. Fortunately stan does not have any directories accessible except for the uucppublic directories, so the user was unable to get the file.

   - uu-status

     Creates a version of the status file as explained in Section 5.9, uudemon.admin, of this document.

   - Corrupt

     Checks for any corrupt files as explained in Section 5.1.2 of this document and mails information on them to the uucp administrator.

   - Foreign

     Takes the information from the Foreign log file and mails it to the uucp administrator.

   - Disk usage information

     Sends a report to the uucp administrator of the disk usage of /usr/spool/uucp. It lists the usage by directory in /usr/spool/uucp plus a total for /usr/spool/uucp.

7. Dispose of mail to uucpa and uucpn

   Deletes any mail in either of these spool directories.

5.11 uudemon.hour

This shell script searches for work files awaiting processing and starts up uusched to get them scheduled. It also starts uuxqt to process files that where previously transferred. uudemon.hour should be run a few minutes after the hour and about 20 minutes before the hour, these numbers can be varied depending on the uucp load on the system at your site.

- uusched

  This command is the UUCP file transport scheduler. It schedules the queued work in the spool directory. uusched selects the sites in the order they appear in /usr/spool/uucp.
- uuxqt

  Executes remote execution requests. It searches the spool directory for execute files (always names X.file) that have been sent from a remote computer. When an X. file is found, uuxqt opens it to get the list of data files that are required for the execution. It then checks to see if the required data files are available and accessible. If the files are present and can be accessed, uuxqt checks the Permissions file to verify that it has permission to execute the requested command.

5.12 uudemon.poll

The uudemon.poll shell script reads the file "/etc/uucp/Poll" once an hour. If any of the machines in the Poll file are scheduled to be polled, a work file (C.sysnXXXX) is placed in the /var/spool/uucp/sitename directory. The script should be run once an hour before uudemon.hour, so that the work files will be there when uudemon.hour is called.

5.13 Crontab Entries

The uudemon commands previously discussed need to be included in the crontab file for the user "uucp". These can be added by executing the "crontab -e uucp" command as root. A recommended setup for uucp might look like:

```
48 8,12,16 * * *     /etc/uucp/uudemon.admin
45 23 * * *          /etc/uucp/uudemon.cleanup
0 * * * *            /etc/uucp/uudemon.poll
11,41 * * * *        /etc/uucp/uudemon.hour
```

The first field is the minutes field and the second field is the hours field. So uudemon.admin is run at 8:48 am, 12:48 am and 4:48pm. These are the entries currently in use on the machine stan. It is recommended that you vary yours from these.

5.14 Administrative, Log, and Spool Files

The administrative and log files are now kept in /usr/spool/uucp. The logs for each system or type of error are kept in 8 subdirectories. Log files can take up many megabytes, depending on your uucp traffic, so be sure to leave enough room for them on the partition where the spool files are kept. For example the spool files for stan, Solbourne's main UUCP machine, take up approximately 10 megabytes.

5.14.1 .Admin

This subdirectory contains the following log files:

- Foreign

  The Foreign log file keeps track of login attempts by systems that are not recognized by /etc/uucp/Permissions. These systems are either incorrectly configured in the Permissions file or are systems that are calling you that do not have access. This file is written by “/etc/uucp/remote.unknown”.
- audit

  This file keeps track of each conversation. Some debugging information is available in this file.
- errors

  This file is self explanatory. It keeps a log of all of the errors that uucp generates when trying to do a transfer.
- uucleanup

  Keeps track of the activities of the uucleanup script in crontab. It reports what actions where taken on what files during the cleanup process. If a site complains about not getting mail, this is a good place to check to see if uuclean deleted it because it was undeliverable.
- xferstats

  This file keeps statistics on the transfer rates (bytes/sec) of uucp conversations. It has an entry for each file transferred.

5.14.2 .Corrupt

Any messages that end up corrupted are put in this directory until they are dealt with or deleted by the cleanup program.

5.14.3 .Log

This subdirectory contains the following sub-subdirectories

- uucico

  The information which went into the old /usr/spool/uucp/Logfile for uucico goes into this directory. Each site has a file created with the information from that site in the file.
- uucp

  This directory logs the activity from the command uucp. Again it is logged into a file for each site.
- uux

  Files in this directory log information for the uux command into files that are named the site name. These logs keep track of the mail that is queued for each site.
- uuxqt

  Files in this directory log information for the uuxqt command.

5.14.4 .Old

When the information in other logfiles becomes obsolete it is condensed into files in this directory. Information from most of the other directories are condensed into single files of the format “Old-Log-1”. These files are kept for a while and then eventually deleted.

5.14.5 .Sequence

A file for each site that your system talks to with the sequence number in it is kept in this directory. Sequence numbers are used as part of the name of jobs queued for uucico.

5.14.6 .Status

This directory contains a file for each site your system talks to with the status of the polling of that system. There are several common status that are of interest. We will discuss a few examples here.

- 0 0 666991919 0 SUCCESSFUL blister

  This status tells us that the connection was successful to site blister.
- 21 2 666989002 600 CALLER SCRIPT FAILED cwi

  This error message indicates an error when trying to call the remote host.
- 2 0 666989230 0 WRONG TIME TO CALL seasolb

  In this case a call to the machine seasolb was attempted during a time that is not allowed by /etc/uucp/Systems
- 12 1 666989939 0 CAN'T ACCESS DEVICE sol-dc

  In this case a device was unavailable to uucico. This could mean that the devices are not configured correctly or that they were all busy when the call was attempted.
- 6 1 666991930 300 LOGIN FAILED solatl

  A connection to the modem at solatl was made, but the transfer was not successful due to a failed login.
- 3 0 666993549 0 TALKING blister

  This means that your system is currently connected to the system blister and that data is being transferred between the systems.

5.14.7 .Workspace

This directory is used as a temporary storage place for uucico workfiles during a transfer.

5.14.8 .Xqtdir

This directory is used as a temporary storage place for uuxqt workfiles.

6.0 Debugging Hints

Problems in connecting to a remote computer may occur initially, once you have everything configured for the first time, or after things have been operating for a while. This section will give pointers to help with debugging under both circumstances. It is based on experience debugging UUCP and tries to give a little information on all of the commands available in HDB UUCP that might help with debugging a connection.

6.1 Check Permissions File

One of the most common places to make a mistake is in the Permissions file. Run uucheck and uucheck -v to verify that the file has been correctly configured. See the uucheck man page as well as previous discussions in this document.

6.2 Check Systems File Information

Check that the information in the Systems file is still accurate. Call the administrator of the remote machine and verify the phone number, passwords, and login.

6.3 Check Error and Log Files

If you are having trouble getting a connection to work properly, check the log files. These files contain a wealth of information about recent and past history.

6.4 uustat

The uustat command displays the status of the connections to other systems or of previous commands. When no options are given uustat displays the status of all uucp requests issued by the current user (this can also be accomplished by using the -u flag followed by a username when root).

uustat -q will give a summary of the connection activity. An example of the output is:

```
stan# uustat -q
bldrsci   1C   02/20-08:12 SUCCESSFUL
boots     1C   02/20-06:03 SUCCESSFUL
cwi       8C   02/20-08:10 TALKING
gaia      1C   02/20-05:15 SUCCESSFUL
ico       1C   02/20-07:26 SUCCESSFUL
milk      1C
monarch   1C
sol-dc    1C   02/20-08:09 SUCCESSFUL
solatl    2C   02/20-07:54 Locked LOGIN FAILED Count: 3
solchi    2C   02/20-07:24 SUCCESSFUL
soldiego  2X   02/20-08:23 SUCCESSFUL
soleast   1C   02/20-08:09 SUCCESSFUL
spuds     1C   02/20-08:02 SUCCESSFUL
tgsys     1C
ub        1C
uksol     2C   02/20-07:23 SUCCESSFUL
```

The first field is the sitename and the last field is the status of the connection. The number that appears next to the “C” is the number of days of the oldest command file destined for that site. Meanings of the status field have been discussed elsewhere in this document and can be found in detail in Section 21.22 of the System Administration Manual.

There are several other useful options to uustat that provide information on the connection status and status of jobs waiting for other sites. See the uustat man page for more information.

6.5 Debugging Transmissions (Uutry)

One of the most useful ways to get an understanding of where the transmission is failing is to run uucico in debug mode and watch the debugging output. This can most effectively be done by using the command “/usr/lib/uucp/Uutry”. Run this command as root to get full debugging information. This command takes two options “-r” and “sitename”. The command will start uucico with debugging turned on (level 5 by default, use the option “-x#” where # is a number from 0 to 9, higher numbers give more output) directing the debugging output to “/tmp/sitename”, and does a “tail -f” on the file. You will have to hit ctrl-C (or your local interrupt character) to end the command and get your shell prompt back.

The following is a listing of the output from a Uutry command to the machine blister from the machine stan. The passwords and phone numbers have been changed. Each block will have a description of the important information in it.

```
mchFind called (blister)
conn(blister)
Device Type TELEBIT wanted
```

These first three lines state the machine called and the device to be used in the call.

```
mlock cua8 succeeded
```

This line tells us that device cua8 is being used. Normally we might see some failures for cuaX, cuaX-1 (or cuaX+1 depending on your system configuration). These failures mean that those devices are in use or are otherwise unavailable.

```
processdev: calling setdevcfg(uucico, TELEBIT)
gdial(tbfast) called
```

This line shows what dialer (tbfast) will be used. At this point we know if our Systems file and Dialers files are correctly set up or not. If we know that the remote system does not have a Telebit modem, then we know that they are not going to be able to connect at tbfast speed (9600 baud) and that we need to change the speed specification in the Systems file to 1200 or 2400 baud. That is, of course, if they do not have some other 9600 baud modem. In our example, we know that blister has a Telebit modem, so things are proceeding as expected.

```
expect: (““)
got it
```

This is the expect-send sequence discussed earlier in this document. The system will wait 90 seconds for a null (““) to be returned. If it is received you will see the message “got it”. This message acknowledges that what was expected by uucp was actually returned.

```
sendthem (DELAY
APAUSE
APAUSE
APAUSE
<NO CR>TE1V1X1Q0S2=255S12=255S50=255^M)
```

Send a series of delays and pauses. Then send the modem a string to initialize it. This is from the /etc/uucp/Dialers file. After this has been sent to the modem the system expects to receive an “OK” from the modem. When this is received a “got it” is displayed. This describes what is seen on the next two lines.

```
expect: (OK^M)
AAATE1V1X1Q0S2=255S12=255S50=255^M^M^JOK^Mgot it
sendthem (ECHO CHECK ON
<NO CR>A^JATTDDTT994411553377552233266^M^M)
expect: (CONNECT FAST)
```

The last two lines above are the dial command (ATDT) with the phone number. Then an expect is issued to wait for the connection message.The phone number was derived from the Systems file. The “CONNECT FAST” is in the tbfast dialer definition in /etc/uucp/Dialers.

```
^M^JRRING^M^J^M^JCONNECT FASTgot it
```

The modems sees a ring, uucp ignores this since it is waiting for the phrase “CONNECT FAST”. Once the modem has connected, it sends the message to the system, which then acknowledges it with “got it”. This confirms the end of the expect-send sequence and the two modems are now connected.

```
getto ret 6
expect: (““)
got it
sendthem (DELAY
DELAY
DELAY
DELAY
^M^M)
```

In this block, we expect to see a null string. We do; then we send some delays as defined in the Systems file.

```
expect: (ogin:)
^M^Jlost line errno - 0
```

The most critical phase of the process is the login. Here we expect a login prompt, but instead the line is dropped. There are many reasons why the line might be lost. We will not worry about this until it happens frequently. Normally this would be the end of the communications with the remote system, but we have two entries in our Systems file for blister, so UUCP automatically tries the system again using the second entry. The only difference from the first and second entries is the phone number.

```
Device Type TELEBIT wanted
mlock cua8 succeeded
processdev: calling setdevcfg(uucico, TELEBIT)
gdial(tbfast) called
expect: ("")
got it
sendthem (DELAY
APAUSE
APAUSE
APAUSE
<NO CR>TE1V1X1Q0S2=255S12=255S50=255^M)
expect: (OK^M)
AAATE1V1X1Q0S2=255S12=255S50=255^M^M^JOK^Mgot it
sendthem (ECHO CHECK ON
<NO CR>A^JATTDDTT9944115533779988333338388^M^M)
expect: (CONNECT FAST)
^M^JRRING^M^J^M^JCONNECT FASTgot it
getto ret 8
expect: ("")
got it
sendthem (DELAY
DELAY
DELAY
DELAY
^M^M)
expect: (ogin:)
```

This is where we failed last time. At this point we have re-dialed and connected to the system and are expecting to see a login prompt returned.

```
^M^J^M^Jblister login:got it
sendthem (ustan^M)
expect: (word:)
 ^M^J^M^Jblister login: ustan^M^JPassword:got it
sendthem (acuinto^M)
```

We get the login prompt, blister login:, as expected. We acknowledge it and send our login, ustan. We then expect to see password, which we do. Finally we send our password.

```
Login Successful: System=o blister
```

We are now logged into the system. You will note here that the answer we received was “System=o blister” which denotes a pre-HDB UUCP version. In HDB version of UUCP the response would be “System=blister”. After a brief period of communications negotiation we will start to transfer files.

```
msg-ROK
 Rmtname blister, Role MASTER, Ifn - 8, Loginuser - root
rmesg - ‘P’ got Pg
wmesg ‘U’g
Proto started g
```

This is an important line to check for if you are having problems transferring files. Protocol “g” is the uucp protocol and is negotiated at start up. In the configuration we have set up here, the “g” protocol is used. If this line shows a different protocol, then one of the two sites maybe misconfigured.

NOTE: Other protocols can be used here; which are being used is site specific. The original audience for this document was the Solbourne Field Offices. Solbourne uses the “g” protocol. Sites you talk to might use something different.

```
*** TOP *** - role=1, setline - X
Request: stan!D.stanc769672 --> blister!D.stanc769672 (uucp)
wrktype - S
 wmesg ‘S’ D.stanc769672 D.stanc769672 uucp - D.stanc769672 0666 uucp
rmesg - ‘S’ got SY
 PROCESS: msg - SY
SNDFILE:
-> 542 / 0.750 secs, 722 bytes/sec
rmesg - ‘C’ got CY
 PROCESS: msg - CY
RQSTCMPT:
mailopt 0, statfopt 0
*** TOP *** - role=1, setline - X
Request: stan!D.blist5652805 --> blister!X.stanNc769 (uucp)
wrktype - S
 wmesg ‘S’ D.blist5652805 X.stanNc769 uucp - D.blist5652805 0666 uucp
rmesg - ‘S’ got SY
 wmesg ‘S’ D.blist5652805 X.stanNc769 uucp - D.blist5652805 0666 uucp
rmesg - ‘S’ got SY
 PROCESS: msg - SY
SNDFILE:
-> 215 / 0.280 secs, 767 bytes/sec
rmesg - ‘C’ got CY
 PROCESS: msg - CY
```

```
RQSTCMPT:
mailopt 0, statfopt 0
```

These lines are typical data transfer lines. We are not going to discuss them much here, but more information can be found on these in the System Administration Manual or other documentation on UUCP.

```
....lines deleted....
*** TOP *** - role=1, setline - X
Request: stan!D.blist5651fb7 --> blister!X.standc761 (news)
wrktype - S
 wmesg ‘S’ D.blist5651fb7 X.standc761 news - D.blist5651fb7 0666 news
rmesg - ‘S’ got SY
 PROCESS: msg - SY
SNDFILE:
-> 200 / 0.270 secs, 740 bytes/sec
rmesg - ‘C’ got CY
 PROCESS: msg - CY
RQSTCMPT:
mailopt 0, statfopt 0
*** TOP *** - role=1, setline - X
Finished Processing file: /var/spool/uucp/blister/C.blisterd5651
wmesg ‘H’
rmesg - ‘H’ got HY
 PROCESS: msg - HY
```

The next line is the beginning of the end. The following lines show how a successful data transfer will terminate.

```
HUP:
wmesg ‘H’Y
cntrl - 0
send OO 0,exit code 0
Conversation Complete: Status SUCCEEDED
```

This section is to give you a basic understanding of how a UUCP transfer should look. By comparing your output to this you should be able to find out why and where your UUCP connection is failing.

6.6 Other Useful Commands

This is a short list of other commands that will be useful in the maintenance and debugging of UUCP connections. See the man pages for more information on these commands.

- uulog
- uuname
- cu
- uuto
- uupick
- tip

7.0 Appendix A - build_uucp_perms

This is the script that will automatically build a Permissions file based on your Systems file. It is also available on stan in “/convert_scripts/build_uucp_perms” or from marke@solbourne.com.

```
#!/bin/sh
#
# Create an initial permissions file leaving permissions generic
#
# Must have /etc/uucp/Systems setup already
#
# Version 1.1 - Fri Feb 15 11:53:56 MST 1991
#
# Marke Clinger - Solbourne Computer, Inc.
#
#
# build strings for each host
#
#
cat /etc/uucp/Systems | \
 grep -v \# | awk ‘{ print \
 “LOGNAME=u”$1 \
 “\\ \nMACHINE=” $1 \
 “\\ \nCOMMANDS=rmail:rnews:uusend” \
 “\\ \nSENDFILES=yes” \
 “\\ \nREQUEST=yes” \
 “\\ \nREAD=/usr/spool/uucppublic:/var/spool/uucppublic “ \
 “\\ \nWRITE=/usr/spool/uucppublic:/var/spool/uucppublic \n#” \
 }’ \
 > /etc/uucp/Permissions_autobld
```

8.0 Appendix B - Setting up Polling Times

The main thing to remember when setting up polling times is to call sites when it makes sense. Remember time zone changes.

For example:

Your site is on the west coast and you are calling a site that you exchange mail with frequently on the east coast. This site is going to be 2 hours ahead of you. So you should poll at 3 and 4 pm your time to pick up the final mail for the day. You may also want to poll again at 4 and 5 pm your time so that all of the mail from your site to them will be waiting on their system when they get in. During the day you may want to poll every other hour.

A good rule of thumb to follow is: call a site several hours before 8 am their time, call several times during the day depending on load between sites, call at end of day their time, call at end of day your time, call once or twice at night.

For sites with a small traffic load call mostly during off hours. Calls to Europe rarely need to be made during the day US time. Call at night when rates are cheap and someone is in the remote office.

9.0 Appendix C

This is the current settings on the modems on stan. They are known to work well with both UUCP and tip.

```
E1 F1 Q4 T V1 W0 X1 Y0 &P0 &T4 Version GE7.00-T2500RM
S00=001 S01=000 S02=043 S03=013 S04=010 S05=008 S06=002 S07:060
S08=002 S09=006 S10=007 S11=070 S12=050 S18=000 S25=005 S26=000
S38=000
S41=000 S45:255 S47=004 S48=000 S49=000
S50=000 S51=255 S52:002 S54:003 S55:003 S56=017 S57=019 S58=003
S59=000
S61=150 S62=003 S63=001 S64=000 S65=000 S66=000 S67=000 S68:003
S69=000
S90=000 S91=000 S92:001 S93=008 S94=001 S95:002 S96=001 S97=001
S98=003
S100=000 S101=000 S102=000 S103=000 S104=000 S105=001 S106=001
S107=020
S110:001 S111:255 S112=001
S121=000 S130=003 S131:001
S150=000 S151=004 S152=001 S153=001 S154=000 S155=000 S157=000
S158=000
S160=010 S161=020 S162=002 S163=003 S164=007 S169=000 S255=001
```

10.0 Acknowledgments

Most of the information for this document was based on Section 21 of the System Administration Manual, my experience in upgrading Solbourne's mail host stan, the source code as distributed by Sun Microsystems, and seven years of (off and on again) UUCP experience.

I would like to thank Greg Foisy who helped in the debugging of HDB UUCP on stan (our main UUCP machine) via a lengthy phone call. Greg also sent a copy of a paper which he wrote a while back with explanations of commands, files, and operation of HDB UUCP. This paper was used as a supplement to Section 21 when writing this tutorial.

Jonathan Clark of AT&T also deserves recognition since he provided the most comprehensive review of this paper. He corrected errors, made suggestions for improvements, and provided information on bug fixes and upcoming features (and promptly reminded me of my AT&T source licence restrictions).