HylaFAX over Debian HOWTO

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This HOWTO describes the way to set up and use HylaFAX to replace the normal fax machine. As well as some scripts to automate the mass fax procedure. All set up in this documentation is Debian specific but should also work for other platforms.

1. Introduction

This HOWTO presents the procedue to set up a fax server using HylaFAX. The aim of this document is to produce a fax machine replacement in Debian. Some hints on the operation will be included at later sections.

1.1. Copyright and License

1.2. Disclaimer

1.3. Credits / Contributors

In this document, I have the pleasure of acknowledging:

- Hong Kong School Net, where I developped this product.
- Diec, my collegue, who taught me about the clue of using RJ45 patching facilities to connect telephone far away.

1.4. Feedback

Feedback is most certainly welcome for this document. Send your additions, comments and criticisms to the following email address : <`adriant [at] ecs [dot] school [dot] net [dot] hk`>.

1.5. Translations

This document was originally written in English. There are no translations yet.

2. System Architecture

This HOWTO is assumed to use Debian (as of writing, 3.0r2, stable stream) as the base system. After the base system is installed successfully, some things you have to do. Firstly, I would prefer to use a newer kernel for better support and have the vulnerabilities fixed. And secondly, install some software, which I will describe it later.

2.1. Kernel Matters!

We are going to make a fax system. So modem is crucial here. However, you must be sure about the supportability of the modem in Linux. The famous winmodem is still here and you have to deal with them probably. See the "Further Information" part for the link of resources.

Personally, I've tried with the Hayes Accura V.90 56K Interal modem (yes, it is ISA, not PCI). If you also own one (basically all ISA modems are similar), please read the follows. Those ISA modems are generally a serial port expansion card from the point of view of your system. So you can (or must?) set on the board to use different COM numbers and IRQs. In my case, I can choose for any combination between COM1 to COM4 and IRQ 2 to IRQ 5. I just choose a combination that do not conflict with my system, say, COM4 (IO port of 0x2e8-0x2ef) and IRQ 5.

However, setting the hardware to make it non-conflicting is not enough. In the Linux kernel side you must compile with the "8550/16550 device support", although you're probably enabled this option by default. As a hint, I am using the kernel 2.6.3, and I have to call **`modprobe serial_cs`** before using the serial port.

In case you are using external modems, you will find your life easier as you don't need to consider about the IRQ conflict issues. Just find a modem and plug it in is okay. But of course, the kernel module for enabling the serial port is always required.

2.2. Testing the modem

After you installed the modem and load the required modules, it probably works. But how to tell?

For me, I love to use minicom, which looks very similar to Telix in the good old days of DOS. In Debian, you can use

```
# apt-get install minicom
```

to install minicom. Firstly, you should call **`minicom -s`** to invoke the configuration mode and configure your modem. Say, if you are using a modem at COM4, please tell minicom that your modem is at `/dev/ttyS3`. Afterwards, you can "save as dfl" and "Exit" back to the minicom main console. At there, to test about your modem, please type **`atz`** and the modem should tell you `OK`. To further test it, please try to ask it to ring your phone. For example: **`atdt`*`76543210`*** where I assumed you are dialing to the number 76543210. It the modem and the telephone circuit works, you should find that number rings.

3. Install the FAX system

3.1. Install the binary

In Debian, installation is an easy job. I just call

```
# apt-get install hylafax-server hylafax-client
```

then I will have the software ready. From the above, you can see that HylaFAX is a client-server architecture. The system works by having a daemon running always that handles the job requests which the client program submits. When the server get the job, it will queue the job up and wait for some suitable time to send it. There is another daemon that does these queueing specifically. Once the modem is available and the job is ready to send, a daemon called the **faxgetty** will directly deal with the faxmodem hardware and send the job.

So by installing the HylaFAX, you are installing four components, namely, the client, the server (**hfaxd**), queue manager (**faxq**), and the **faxgetty** (and some auxillaries). Remembering these four components can help you understand of how they works.

3.2. Configure the system

Depends on which version (or, when) you install the hylafax into Debian, the installation script may or may not call the **faxsetup** command for you. But anyway, the default version of **faxsetup** is broken in Debian. Please refer to the following **diff** output to modify it:

```
--- faxsetup.orig    Fri Mar  5 18:07:39 2004
+++ faxsetup.new Fri Mar  5 17:45:05 2004
@@ -67,8 +67,8 @@

 FAX=fax # identity of the fax user
 SERVICES=/etc/services  # location of services database
-INETDCONF=/usr/etc/inetd.conf  # default location of inetd configuration file
-ALIASES=/usr/lib/aliases    # default location of mail aliases database file
+INETDCONF=/etc/inetd.conf   # default location of inetd configuration file
+ALIASES=/etc/aliases    # default location of mail aliases database file
 PASSWD=/etc/passwd  # where to go for password entries
 PROTOUID=uucp   # user who's uid we use for FAX user
 defPROTOUID=3   # use this uid if PROTOUID doesn't exist
@@ -85,7 +85,7 @@
 DIR_LIBDATA=/etc/hylafax    # directory for client data files
 DIR_LIBEXEC=/usr/sbin   # directory where servers are located
 DIR_LOCKS=/var/lock # UUCP locking directory
-DIR_MAN=/usr/local/man  # directory for manual pages
+DIR_MAN=/usr/share/man  # directory for manual pages
 DIR_SBIN=/usr/sbin  # directory for server applications
 DIR_SPOOL=/var/spool/hylafax    # top of fax spooling tree

@@ -98,7 +98,7 @@
 PATH_EGETTY=/etc/hylafax/egetty-link   # pathname for external getty program

 PS=gs   # default PostScript RIP package
-PATH_GSRIP=/usr/local/bin/gs    # pathname of Ghostscript RIP
+PATH_GSRIP=/usr/bin/gs  # pathname of Ghostscript RIP
 PATH_DPSRIP=/usr/sbin/ps2fax.exe    # pathname of old IRIX DPS RIP
 PATH_IMPRIP=/usr/lib/print/psrip    # pathname of IRIX Impressario RIP
```

Briefly, the above is to modify the `/usr/sbin/faxsetup` so that to reflect the correct location of mail aliases file (`/etc/aliases`), inetd configuration (`/etc/inetd.conf`), directory for man pages (`/usr/share/man`), and finally the path for ghostscript interpreter (`/usr/bin/gs`).

I don't know why the **faxsetup** file is messed. But after you finish the above modification, it should work anyway. So you can call **faxsetup** directly on the command line using root priviledge.

The **faxsetup** command does not require user interaction, it just do its job automatically. After that, your HylaFAX system should work as **faxsetup** created the files `/etc/hylafax/setup.cache` and `/etc/hylafax/setup.modem` for you. But don't forget to call **faxaddmodem** to add a modem or your HylaFAX will not find any device to work with.

To invoke **faxaddmodem**, just call:

```
# faxaddmodem ttyS3
```

where *ttyS3* is your modem device. You should found this script very annoying and it asks for so many things. For me, I just press **Enter** several times to use the default value and modify the configuration file later. The use of this command is to add an modem to HylaFAX system and let the daemon know about the existence.

After these, you can probably get your system ready for fax.

3.3. Fine-tune the system

Although your system is ready, you should fine tune a little bit. The following is a list of file that you would found useful:

- `setup.modem`, a shell script that automatically generated by faxsetup
- `setup.cache`, a shell script that gives environment variable settings for other HylaFAX programs
- `config`, system configuration, for example, log facility
- `config.`*`ttyS3`*, device configuration. You should have one for each modem device
- `hfaxd.conf`, HylaFAX daemon configuration file
- `hyla.conf`, configuration for fax clients
- `hosts.hfaxd`, access control list for the HylaFAX server
- `FaxDispatch`, environment configuration shell script that used by fax receiver

As mentioned before, if you can't find `setup.modem` and `setup.cache`, you are probably forget to run the **faxsetup** program. But indeed, the **faxsetup** only create these and modify the `config` for you so if you're unable to run that command for some reason, you can still make one by your self. I've copied mine at the appendix of this document.

The `config`, however, should probably changed. In my case, I live in Hong Kong and we don't have Area Code. So I just left the line `AreaCode:` blank by removing the digits that add by the **faxsetup**. You can do the similar thing to other configuration directives to make it fit your case.

The `config.`*`ttyS3`* is similar to `config`, but created by **faxaddmodem** and it overrides the global configuration. You can include nearly any directive from `config` and change that directive for a particular modem (and phone line). You can consult the hylafax(5F) man page for the details about this config file. But there are some points to note: firstly, the "RingsBeforeAnswer:" directive represents how many ring tone should the modem hear before picking up the phone and answering the fax. If you want the HylaFAX system do only outbound fax but no inbound fax, you can set this directive to zero. Secondly, there is a "ModemRate:" directive but this do nothing with your modem's rate. This rate is just the DCE-DTE communication rate, which means the rate that your computer talk to the modem device. So you would found the **faxaddmodem** command give you "38400" usually even though your modem is just running 28800 bps.

`hfaxd.conf` is the configuration file for the fax daemon. There is nothing that I need to change apart from default installation, except the log file. Basically, the HylaFAX daemon seems not to use the syslog for the logging purpose all the time. Rather, it handles the client-server communication log by its own. So you may want to reset the log path, "XferLogFile:"

`hyla.conf` is the configuration file for the fax clients. It describes which host is the default host that your fax daemon is sitting in, and which time zone to use. Unless you want to remotely control the fax daemon and submit fax job across the network, you can just left the default setting as is.

At the bottom of `hyla.conf`, there should be some lines about the "FontMap:" and "FontPath:". They are providing the path for the ghostscript to search for its files. If you're failed to provide these, you will not be able to convert the job (in postscript) to the TIFF format which is suitable for facsimile. For me, I use these which correspond to my Debian system:

```
FontMap:   /var/lib/defoma/gs.d/dirs/fonts:/usr/share/ghostscript/common: \
               /usr/share/gs/6.53:/usr/share/fonts/type1/gsfonts
FontPath:  /var/lib/defoma/gs.d/dirs/fonts:/usr/share/ghostscript/common: \
               /usr/share/gs/6.53:/usr/share/fonts/type1/gsfonts
```

The server would not just allow any client from anywhere to connect and send the fax. Rather, it has some control about by using the `hosts.hfaxd`. According to the hosts.hfaxd(5hylafax) man page, you can use it for host and user control. This file is quite special compared to others that it must be owned by the fax user (in the default installation of Debian, it is "`uucp`") and having the mode 600 or your fax system will deny to work. The following is my `hosts.hfaxd` but the general format should be referenced to the man page.

```
localhost:101::
192.168.0.24:101::
```

The key point in this file is to include all the valid host name or address of the clients or the HylaFAX server daemon will simply drop all their fax-out requests. The number in the second field is the system UID that the matching client will use. In the default installation of Debian, the UID for the localhost line is 101, which correspond to the `faxmaster` account. All the resources that the fax job used are controlled with correspondance to this UID as a usual system.

The last file of the above list is `FaxDispatch`. This is a shell script as well. This will be used by the **faxrcvd** program which located at `/var/spool/hylafax/bin/`. This file is solely configuring the facsimile dispatching script to tell it how to do with the fax received. Taking the listing below as a reference, we can set the received fax send to which person and the general system message should send to which person. The fax document was originally in TIFF format which is quite standard in the fax world. You can convert it into PDF or Postscript for more convenient reading. To do so you have to specify `tiff`,`pdf` or `ps` to the `FILETYPE` respectively. Remember that this is a shell script and all the shell escaping applies.

```
FILETYPE=pdf
SENDTO="secretary@example.com"
NOTIFYTO="admin@example.com"
```

4. Using the Fax System

4.1. Simple Usage

The simplest way to use HylaFAX is to send a fax by command line. The command line tool to send fax is called **sendfax**. Basically the HylaFAX server accepts fax job in Postscript or TIFF formats but **sendfax** allows PDF, plain text and some other as well. Of course, your system should have the appropriate conversion tools available so that **sendfax** can submit the fax job to the HylaFAX server in either PS or TIFF.

The syntax of using the **sendfax** command is as follows:

sendfax [-a *`start-time`*] [-D] [-d *`phone-number`*] [-f *`sender`*] [-F *`tagline`*] [-h *`server-host`*] [-I *`retry-interval`*] [-k *`kill-time`*] [-m] [-n] [-P *`priority`*] [-t *`tries`*] [-T *`max-dial`*] *`file`*...

-a *start-time*

This option specifies the time to start the fax job. The time can be specified in formats like "HH:mm MMM DD" or "now + n minutes". Example of valid *start-time* are "16:00 Dec 25" and "now + 3 days". Please note that the time are specified in your local time.

-D

Specifying the -D option will make HylaFAX daemon send notification to you when the job is delivered. Normally, mail is sent only if problems occur.

-d *phone-number*

This option specifies the phone number of the receiver's fax machine. HylaFAX will dial this number according to the modem's specification such that any prefix will be prepended accordingly and then this number.

-f *sender*

This specifies who is the sender. This is supposed to specified in e-mail address so that the notification mail can be returned.

-F *tagline*

This specifies the tagline of the fax document. This is the line that appears on the top of every page. My favorite tagline is "From Adrian TAM of Some Organization|Tel: 1234567|Page %%P of %%T" and the detail on how to construct the tagline is documented in the hylafax(5F) man page.

-h *server-host*

Specifies where the HylaFAX server locates. You can also specify "*modem@hostname*" to appoint a specific modem to handle your job.

-I *retry-interval*

In case of failure, the fax job may re-queued and retried at some later time. This option specifies how long should the job wait at least before retrying. The retry interval accepts suffixes like "min", "hour", and "day".

-k *kill-time*

The fax job will not stay in the server forever. Upon the kill time expired, the job will be removed. Here, the kill time option uses the similar syntax as the -a option to specify a kill time. In case your server is full of fax jobs (e.g. doing mass fax), you may need to specify a longer kill time or your job may be killed without even the first trial.

-m

Normally, the fax job is sent in normal resolution. By specifying this -m option, the fax job will be sent using fine resolution. Of course, whether this improves the quality depends on your source document.

-n

If specified, the fax job will carries no cover page. Use this to save trees.

-P *priority*

Every fax job carries a priority value from 0 to 255. Default is 127 and you can specify another priority value for your job. The smaller the number, the higher the priority.

-t *tries*

Number of times a fax should be retried. Default is 3. Please note that this number is significant only if the connection is established and the submission is failed. Busy tone, call with no answer or the receiver is not a fax machine will not count toward this number.

-T *max-dial*

Number of times a fax number should be dialed. If the number is dialed for this number of times and the fax job still cannot be submitted, the job will be killed. This number do not differentiate why the job is failed. Any failed submission is a fail.

file

Finally, the fax job document in terms of a file.

There are still many things can do with **sendfax**. You can always check with the sendfax(1hylafax) man page. As an example, I commonly use the shell script below for my fax and hold the default values for the **sendfax** command.

```
#!/bin/bash
number=$1
document=$2
trial=${3:-5}
life=${4:-24}

sendfax -n -m -k "now + ${life} hours" -T ${trial} -f ‘whoami‘ \
        -F ’From My Company|Tel: (852)9999-9999|Page %%P of %%T’ \
        -d ${number} ${document}
```

Here you can see that, the **sendfax** command accepts arguments as a single token only. So in cases like the time in -k option, you have to quote up the string before passing to the **sendfax** command.

4.2. Mass Fax

Sending mass fax is annoying. But in case you really need to do, HylaFAX is your friend. According to the last section, you can use command to send a fax. So you can make that command into a loop and use. Example is as follows:

```
for x in ‘cat numbers.txt‘ ; do
        sendfax -n -m -k "now + 48 hours" -T 10 -f admin \
        -F ’From My Company|Tel: (852)9999-9999|Page %%P of %%T’ \
        -d $x faxdocument.tiff
done
```

As you can see, there is nothing special. In case your fax document is the same for all your recipiants, I would suggest you to convert your document into TIFF format before actually submitting the fax job to the server daemon. The reason to do this is, upon the job is being send over the telephone, the fax server will call ghostscript to convert the job into TIFF format to favor the fax protocol. However, this is done on every fax job so if your fax content is identical, you can do it beforehand and save some CPU cycles and speed up the pipeline process. To pre-convert the job, you can call the ghostscript by hand. Below is my conversion script to convert PDF or Postscript documents into TIFF. The utilities **file**, Perl and ghostscript are required.

```
FILE=$1
TYPE=‘file -ib ${FILE} 2>/dev/null | perl -pe ’s,.*/„’‘

if [ "$TYPE" = "pdf" ]; then
        OUTFILE=‘echo $1 | sed -e ’s/\.pdf$//’‘
elsif [ "$TYPE" = "postscript" ]; then
        OUTFILE=‘echo $1 | sed -e ’s/\.ps$//’‘
fi
OUTFILE="${OUTFILE}.tiff"

if [ "$FILE" == "$OUTFILE" -o "$OUTFILE" == ".tiff" ]; then
        echo "Postscript/PDF to TIFF converter for FAX use"
        echo "  I need a *.ps/*.pdf file as input and I’ll give you a *.tiff file"
        exit 1
fi

if [ "$TYPE" = "postscript" ]; then
        cat ${FILE}
elsif [ "$TYPE" = "pdf" ]; then
        pdf2ps ${FILE} -
fi | gs -q -sDEVICE=tiffg3 -dNOPAUSE -dSAFER=true -sPAPERSIZE=a4 \
        -dFIXEDMEDIA -r204x196 -sOutputFile=${OUTFILE} -
```

Sometimes, your fax document is the result of mail-merge. In this case, psutils package is very useful for you (**`apt-get install psutils`**). You can just mail-merge your document and then print the merged batch. The print should be done with a Postscript or PDF file generator so that an usable file can be produced. Then you can call the tools in psutils package to split the pages for you.

For completeness, I list my script below which uses the command **psselect** to select some pages in the Postscript document which will suitable for mass fax.

```
#!/bin/bash

NUMBERFILE=$1
FILE=$2
PAGESPERUNIT=$3
TYPE=‘file -ib ${FILE} 2>/dev/null | perl -pe ’s,.*/„’‘

if [ "$TYPE" == "pdf" ]; then
        BASENAME=‘echo ${FILE} | sed -e ’s/\.pdf$//i’‘
elif [ "$TYPE" == "postscript" ]; then
        BASENAME=‘echo ${FILE} | sed -e ’s/\.ps$//i’‘
fi

if [ "$FILE" == "$OUTFILE" -o "$BASENAME" == "" ]; then
        echo "Postscript/PDF to multiple-PS croper for FAX use"
        echo "  I need a *.ps/*.pdf file as input and I’ll give you a bunch of *.ps file"
        exit 1
fi

STARTPAGE=1
ENDPAGE=$PAGESPERUNIT

for NUMBER in ‘cat ${NUMBERFILE}‘ ; do
        if [ "$TYPE" == "postscript" ]; then
```

```
                cat ${FILE}
        elif [ "$TYPE" == "pdf" ]; then
                pdf2ps ${FILE} -
        fi |
        psselect -p ${STARTPAGE}-${ENDPAGE} > ${BASENAME}-${NUMBER}.ps

        STARTPAGE=$(( $STARTPAGE + $PAGESPERUNIT ))
        ENDPAGE=$(( $ENDPAGE + $PAGESPERUNIT ))
done
```

You can even crop the pages, convert it into tiff and submit the print job as whole, the resultant script is as follows:

```
#!/bin/bash

NUMBERFILE=$1
FILE=$2
PAGESPERUNIT=${3:-1}
TRIAL=${4:-5}
LIFE=${5:-24}

TYPE=‘file -ib ${FILE} 2>/dev/null | perl -pe ’s,.*/„’‘

if [ "$TYPE" == "pdf" ]; then
        BASENAME=‘echo ${FILE} | sed -e ’s/\.pdf$//i’‘
elif [ "$TYPE" == "postscript" ]; then
        BASENAME=‘echo ${FILE} | sed -e ’s/\.ps$//i’‘
fi

if [ "$FILE" == "$OUTFILE" -o "$BASENAME" == "" ]; then
        echo "Postscript/PDF to multiple-PS croper for FAX use"
        echo "  I need a *.ps/*.pdf file as input and I’ll give you a bunch of *.ps file"
        exit 1
fi

STARTPAGE=1
ENDPAGE=$PAGESPERUNIT

for NUMBER in ‘cat ${NUMBERFILE}‘ ; do
        if [ "$TYPE" == "postscript" ]; then
                cat ${FILE}
        elif [ "$TYPE" == "pdf" ]; then
                pdf2ps ${FILE} -
        fi |
        psselect -p ${STARTPAGE}-${ENDPAGE} |
        gs -q -sDEVICE=tiffg3 -dNOPAUSE -dSAFER=true -sPAPERSIZE=a4 \
                -dFIXEDMEDIA -r204x196 -sOutputFile=${BASENAME}-${NUMBER}.tiff -

        sendfax -n -m -k "now + ${life} hours" -T ${trial} -f ‘whoami‘ \
                -F ’From My Company|Tel: (852)9999-9999|Page %%P of %%T’ \
                -d ${number} ${BASENAME}-${NUMBER}.tiff

        STARTPAGE=$(( $STARTPAGE + $PAGESPERUNIT ))
        ENDPAGE=$(( $ENDPAGE + $PAGESPERUNIT ))
done
```

4.3. Receiving FAX

HylaFAX monitors the mdem by the **faxgetty** command. This command works generally as a daemon to look after the modem hardware. Whether the modem is available to send a fax job is determined by this. The simple way to bring up the modem and work is to modify the system's rc-script. I added this line to `/etc/init.d/hylafax`:

```
start-stop-daemon --start --make-pidfile --pidfile /var/run/faxgetty.pid \
        --exec /usr/sbin/faxgetty -- -D /dev/ttyS3
```

Please note that having faxgetty running is critical. No matter you run this according to my approach of using rc-script, or according to the original documentation to use `/etc/inittab`, there must be one for each modem. In fact, this is the only daemon that can get the information from the hardware directly. So even you're running a send-only fax server, you must run the faxgetty or your hfaxd will not work properly.

There is nearly nothing to config for receiving. The only thing make sense here is the "RingsBeforeAnswer:" directive in `/etc/hylafax/config.`*`ttyS3`*. This controls how many rings the faxgetty daemon should hear before picking up the phone. You can set to any number and if you want the system responsive, set it to 1. Setting this option to 0 actually means to ignore all incoming calls and this should be the setting use for fax-out only fax server.

4.4. Tuning performances

You can do nothing to speed up the modems and the time you spend in sending fax. As all the communication between your modem and the receiver's fax machine are standardized, you can hardly tweak up anything and the default setting is usually optimal.

However, I do not mean you really don't have anything can do. In terms of a long fax queue, occationally substantial amount of time are wasted between facsimiles if the original format of document is not in TIFF format. It is because the underlying mechanism of HylaFax is a streamline process. For a document to sent, it has to convert to TIFF which is the native format over the telephone wire. The conversion process would not start before the fax job is being served and the modem would not dial the number unless the conversion is finish. Hence you can see why the time are wasted.

To eliminate this conversion time, pre-conversion is preferred, especially for the mass fax. You can consult the script in some sections before for the exact command.

Finally, knowing the AT command is important. All modems are configured using the AT commands and without that, you can hardly tweak the internal setting of the modems. Depends on your country and environment, you may need to tweak the setting of the modem hardware before use. My experience on this is that: in my office, there are some telephone lines with incoming redivert turned on. Those telephone lines after turned on the redivert will get a different dial tone initially. So in using those lines, I have to change a S-register in the modem. This is done only with the AT commands (with the help of **minicom**).

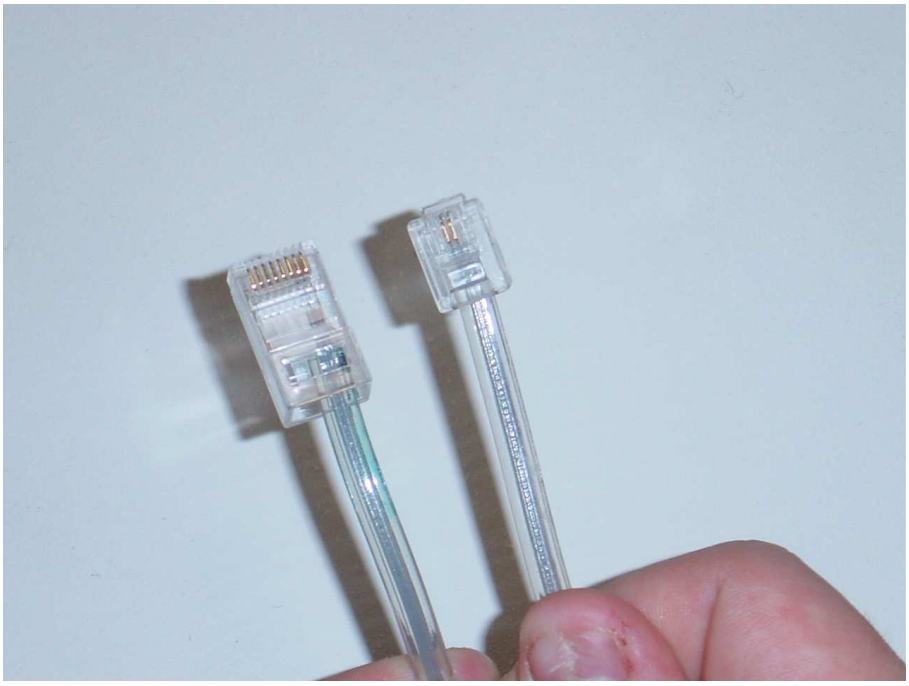
4.5. Wiring

I assume the fax server is a dedicated server in this document. Because it is a server, we would like to put it into the server room to shield the noise from human (especially if you do not turn off the sound of your modem). So now come into a problem of connecting the server's modem to the telephone socket.

In my office, the telephone socket is outside the server room and the servers are put inside. In order to connect to the telephone line, I can either use a very long telephone cord or (ab)use the RJ-45 wall sockets. And I chose the latter solution to make things neat.

The configuration of my office is same as many others. The other end of those RJ-45 wall sockets will connected to the patch panels inside the server room. The connection is done with CAT-5 cables embedded inside the wall. To make use of this facility, I firstly put my fax server and the modem (external or internal) into the server room. Secondly I get a telephone cord that suitable for connecting the *telephone's* wall socket to the modem. Length of the cord is not a problem, what I need is it can pass the connectivity test, which means it is in the correct pin-layout.

Figure 1. Cutting a telephone cord to make a pair of RJ45-RJ11 cable

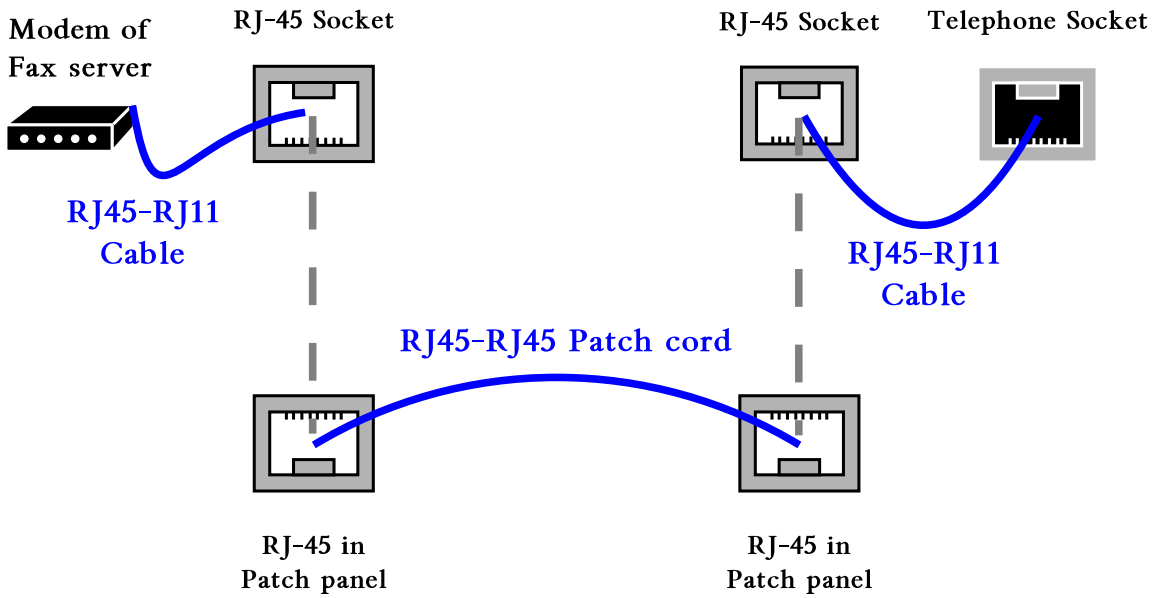


The next step of wiring is to cut off that telephone cord. But please mark the cablets of the cord (usually there are two cablets which known as "tip" and "ring" lines) so you can make sure not to mix them up. Then you need a cable cramp and a pair of RJ-45 jacks and pick up the two "broken" pieces of the telephone cord, cramp the open ends of each piece into a *RJ-45* jack. Personally I would prefer using the pins 7 and 8 of the RJ-45 jack to hold the cablets of the telephone cord. This is just a matter of safety as this two pins are not used in normal networking and therefore probably insulated in hubs and switches. What you should care is to make sure the pin-layout is identical on both ends and don't connect the tip to the ring.

Now you have a pair of strange cables such that each one has one end in RJ-45 jack and another end in RJ-11

jack. You can then use this pair to connect the fax server. The schematic diagram is as below.

Figure 2. Schematic Diagram of RJ11-RJ45 Wiring



5. Troubleshooting

The following are some questions and answers that you will probably encounter or interesting to know. Contributions are welcome.

1. What are those in `/var/spool/hylafax`?

The sub-directories in `/var/spool/hylafax` are the core data and configuration of HylaFAX. Some of the important ones are:

- `bin`, shell scripts that used by various operation of HylaFAX like sending fax-to-mail and file type conversion.
- `config`, repository of different default HylaFAX configurations for different kinds of modems. No need to touch it most cases.
- `dev`, the named pipes (FIFOs) resides here. They are critical communication facilities between different HylaFAX processes, such as the queue scheduler and faxgetty.
- `docq`, document repository. Here stores the fax documents, and keeping all the formats that HylaFAX is ever used.
- `doneq`, directory containing the job files of completed fax jobs. Completed can either mean successfully sent or failed, but dispatched from the queue anyway.
- `etc`, a symbolic link to `/etc/hylafax`. Some systems such as RedHat will do in reverse, in other words, `/etc/hylafax` is a symbolic link to this directory.
- `info`, information gathered about the remote sides' fax machine, named after the corresponding fax number. This helps HylaFAX to adjust the suitable configuration when communicating with the same number in the future.

- `log`, fax session log. Files describe the exact modem operation. Each dial attempt is stored in a separate file. The summary is in `log/xferfaxlog`.
- `recvq`, directory containing the job files of received fax jobs.
- `sendq`, directory containing the job files of fax jobs that queued up and waiting to be sent.

2. How can I reset the sequence number of fax jobs?

In HylaFAX, the sequence number are automatically incremented. And in fact, there are several set of sequence numbers in the fax system. For example, there are document numbers, outbound fax numbers and inbound fax numbers. But at the end, all these sequence numbers are recorded in a file named `seqf` in the respective spooling directory. So to reset the sequence number, just edit that file. But be careful that `seqf` do not bear the newline character at the end of the number.

In case you want to reset the fax job as well as clear all the fax history, spooled files and so on, you can call this:

```
/etc/init.d/hylafax stop
rm docq/* doneq/* info/* log/* recvq/* sendq/*
/etc/init.d/hylafax start
```

You will have the sequence number reset to 1 after this.

3. Why my fax job get stalled?

If you find your HylaFAX server and queue manager are still running correctly but the fax job is stalled, please also make sure your **faxgetty** is also running correctly.

4. How to set the modem not to receive inbound calls? How to set the modem to receive inbound calls only after *n* rings?

Modify `/etc/hylafax/config.`*`ttyS3`*, find the line "`RingsBeforeAnswer:`" and set it to the number of rings to hear before the modem can answer the call. setting to 0 means never answer any inbound calls.

6. Further Information

Here are some links that believed to be useful:

- http://www.linmodem.org/ (http://www.linmodems.org/) is a site to provide Linux winmodem support information. You can find links to the drivers and compatibility data. Read this site before you purchase to prevent getting an unusable card.
- http://www.linuxant.com/drivers/ has drivers for Conexant HCF and HSF modem drivers. The HCF/HSF modems are one of the very common winmodems.
- http://www.agere.com/client/docs/v90atcom.pdf, Host-Based Controller Modem AT Command Set. A PDF manual of AT commands. Generally the manual of any vendor can usually work with other vendor.