Neda Libre Fax Appliance Design and Implementation Notes Debian HylaFAX-Plus-Plus – A Family of Adopted LSIP Components

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Version 1.0 May 5, 2003

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1 Fax Capability

Fax capability is provided as a generalized module that can be customized and integated in various ways.

1.1 MMA Hylafax Resource Center

Hylafax (http://www.hylafax.org) is a mature and feature rich open-source software package for Linux.

We have put together a complete collection or related software available at http://www.mailmeanywhere.org/

1.2 Inbound Faxes

Based on the incoming fax phone line, the fax becomes an email attachment and an email is sent to the fax distributor operator. Which then forwards or resends the inbound fax to its proper destination.

1.3 Outbound Faxes

A number of different interfaces for sending out faxes are supported.

2 Fax Server

The hylafax software is installed, configured and managed using an mma interface.

2.1 mmaFax Interface

A complete mmaFax module has been put together. See mmaFaxRoadmap.sh for an overview.

2.2 Current Modem Setting

Currently, the fax server is run on Linux machine named Janeway. The modem that are currently used is "Hayes Century 2 Rack System" modem. It can hold up to 16 serial modem, but for now it only has 8 modems installed on that rack.

2.3 KNOWN PROBLEM WITH MODEM

- Use Class 2 modem when setting up the modem (i.e. when running the faxaddmodem)
- To debug the modem on Linux, use minicom
 - Common command line:
 - at&f factory setting
 - at&v current setting
 - at&w write new setting
- If there is error occur when receiving fax with message " Missing EOL after 5 seconds", edit the config.ttySx and chnage the following value:

```
Class2RecvDataTrigger: "\022"
```

This is caused by a flow control configuration problem. This happen if the trigger is wrong.

3 Fax Clients

3.1 Outbound Fax Clients Interface - UNIX

Hylafax comes with a number of GUI and script based interfaces. sendfax is the primary command. These client programs are a standard part of the HylaFax distribution.

3.2 Windows HylaFax Client (WHFC)

The WHFC package is available at http://www.mailmeanywhere.org/

It needs to be configured with the fax server information. When installing this software, choose custom installation for English version otherwise the default installation would be in German.

Make sure that the Sender information is filled in the User preferences menu.

In order to use the fax client, the user need to be added to hylafax's permission file. Use the following command to add the user: mmaFaxAdmin -p username=lisa -i faxUserAdd.

As of version 1.0.9 (the latest as of May 1, 2003) you can enable passive ftp connections when setting the registry key HKEY_LOCAL_MACHINE\SOFTWARE\Whfc\UsePasv to 1. If you want active connection (default) set this key to 0. This might be useful in the firewall environment.

In order to be able to view the incoming fax, you need to configure and install several things:

- 1. Install tiff viewer (get it from http://www.mis2.udel.edu/ terence/tiffview/). Install it in C:/ProgramFiles\TiffViewer.
- 2. Alternatively, Kodak Imaging for Windows is included with the Windows 98 and Windows 2000 operating systems. Use this instead of tiffview.
- 3. To view the incoming fax, first you have to export the directory /var/spool/fax/recvq on your HylaFAX host e.g. via samba. If you do it with samba you can put the following entry in smb.conf :

```
[recvq]
    comment = Fax Receive Queues
    browsable = yes
    path = /var/spool/fax/recvq
    public = yes
    writable = no
```

4. Edit your /var/spool/hylafax/etc/config.ttySx and change the following:

RecvFileMode:	0644
LogFileMode:	0644
DeviceMode:	0666

5. enter "c:\ProgramFiles\TiffViewer\TIFFVIEW\\hylafaxhost\recvq\%s" or C:\Program Files\Windows NT\Accessor on the systemsettings dialog in the field "Program and arguments for viewing received faxes" (replace hylafax host with the correct hostname of your HylaFAX server).

3.2.1 Outbound Email To Fax Gateway

An email to fax gateway which takes email with attachments addresses to 425-644-2886@fax.someDomain.com will also be setup.

4 Recommended Configuration

The comprehensive configuration that we recommend is shown in Figure 1 and Figure 2.

4.1 Fax Modems

External modems work a lot better than internal modems for fax server.

With external modems, one can visually view the current status of each modem, one can add and remove modems of various types, one can physically turn on and off individual modems, ...

4.2 Ultra High Speed PCI I/O Card

4.2.1 PCI-800H-25 Specificaion

Manufacturer: VScom

Description:

- 8-port Serial, 16950 UARTs (128-byte FIFO), RS-232, PCI-bus 5-volt, plug & play card.
- Settable to COM1-COM99.
- Supports fast data transfer rates (up to 921,600 bps).
- Provides 8 DB25 (25-pin male) serial connectors via an included octopus cable that plugs on to the back of the card.
- Uses only 1 IRQ and can share an interrupt with other plug & play devices in your system.
- Designed for use with Windows 95, 98, ME, 2000, XP, NT 4.0, DOS, Linux kernel 2.0.xx and later & OS/2. Drivers/instructions for these operating systems are included.

4.2.2 Installation

 At present, this board was installed on Debian Linux with kernel version 2.4.18 2) Install devfsd: Daemon for the device filesystem (new type of device interface to Linux, starting with kernel 2.4). If the fernel does not support devfsd, do it manually cd /dev; ./MAKEDEV ttyS4

Do that for all serial

 The board should have been recognize at boot time Run:

setserial -g /dev/ttyS*

you'll see some info about how that device driver is configured for your ports. Note that where it says "UART: unknown" it probably means that no uart exists. In other words you probably have no such serial port and the other info shown about the port is meaningless and should be ignored. If you really do have such a serial port, setserial doesn't recognize it and that needs to be fixed.

The possible outcome of setserial command is as follow:

```
/dev/ttyS0, UART: 16550A, Port: 0x03f8, IRQ: 4
/dev/ttyS10, UART: 16950/954, Port: 0xe410, IRQ: 10
/dev/ttyS11, UART: 16950/954, Port: 0xe418, IRQ: 10
/dev/ttyS4, UART: 16950/954, Port: 0xdc00, IRQ: 10
/dev/ttyS5, UART: 16950/954, Port: 0xdc08, IRQ: 10
/dev/ttyS6, UART: 16950/954, Port: 0xdc10, IRQ: 10
/dev/ttyS7, UART: 16950/954, Port: 0xdc18, IRQ: 10
/dev/ttyS8, UART: 16950/954, Port: 0xe400, IRQ: 10
/dev/ttyS9, UART: 16950/954, Port: 0xe400, IRQ: 10
```

4.3 Intranet Features

Within the Intranet, the email-to-fax gateway is disabled.

Within the Intranet, the client server feature is enabled. Because we are in a secure environment, client access restrictions can be minimal.

- Incoming Fax Through Email Distribution
- Outbound Fax For Intranet Clients

4.3.1 Incoming Fax Through Email Distribution

The incoming fax is sent to dedicated email address (i.e. fax@somedomain.com) and from there it will be distributed to the correct recipient. In order to do this, the fax server need to create the fax dispatch:



Figure 1: Intranet Fax Server Configuration

```
- Create a file /var/spool/hylafax/etc/FaxDispatch
 This file will contain the following line:
FILETYPE=pdf
SENDTO=fax@somedomain.com
  The FILETYPE can be either ps, pdf, or tiff
- If the FILETYPE is pdf, customization of
  /var/spool/hylafax/bin/faxrcvd is needed.
  - Download fax2pdf source file from:
       http://sourceforge.net/projects/fax2pdf or
       from local (/opt/public/mmaSrc/fax2pdf)
    gunzip, tar it, and run make. Copy fax2pdf application
    to TIFFBIN (usually it's /usr/local/bin).
    If in doubt, you can check the variable of TIFFBIN
    in /var/spool/hylafax/etc/setup.cache.
  - Download mimencode from:
       ftp://www.fax2send.com/ac000609/misc/mimencode.tgz or
       from local (/opt/public/mmaSrc/fax2pdf)
    gunzip and then tar it. Copy mimencode application to
    /usr/bin (you can copy it anywhere you want as long
    as it's in your path)
  - Edit the /var/spool/hylafax/bin/faxrcvd as the following:
    Add line:
      FAX2PDF=$TIFFBIN/fax2pdf
    Edit the if clause for FILETYPE=pdf to be like:
         elif [ "$FILETYPE" = "pdf" ]; then
             echo "Content-Type: application/pdf; name=\"c$COMMID.pdf\""
             echo "Content-Description: FAX document"
             echo "Content-Transfer-Encoding: base64"
             echo "Content-Disposition: attachment; filename=\"c$COMMID.pdf\""
```



Figure 2: Public Fax Server Configuration

```
echo ""
  $FAX2PDF $FILE $FILE.pdf 2>/dev/null
  $MIMENCODE $FILE.pdf 2>/dev/null
  $RM -f $FILE.pdf 2>/dev/null
else # default as Postscript
  .....
  ....
```

4.4 DMZ Features

On the DMZ side, the client server feature is disabled. This makes the DMZ server more secure.

On the DMZ side, the email-to-fax gateway is enabled.

- Incoming Fax Through Email Distribution
- Email To Fax Gateway

4.5 PBX and Modem Configuration

Generally speaking, external modems are preferred.

In order to provide for continous incoming fax processing, enable immediate ringing on the primary server (Intranet) and delayed ringing on the secondary server (DMZ).

Program all incoming fax modems uniformly for first ring pick-up.

Allow for incoming fax modems to also be used for outgoing but out them at lower priority than dedicated outgoing faxes.

5 Introduction

This manual is intended to give an overview of how to manage and use various fax clients.

Section 7, describes two kinds of fax client software for Windows: WHFC and Cypheus.

HylaFAXTM is the current fax server that is used and is installed in a Linux machine.

5.1 About HylaFAXTM

HylaFAXTM is an enterprise-class system for sending and receiving facsimiles as well as for sending alpha-numeric pages.

The software is designed around a client-server architecture. Fax modems may reside on a single machine on a network and clients can submit an outbound job from any other machine on the network. Client software is designed to be lightweight and easy to port.

For complete HylaFAX command options, we created an administration script called mmaFaxAdmin.sh. Run this script on the fax server.

5.2 Windows HylaFAX Clients

We recommend WHFC (see Section 7.1) for free fax client software. It is available under GNU Public license. For commercial use, we recommend Cypheus (see Section 7.2). Cypheus is more featureful and better supports for Windows integration.

6 Receiving Faxes

Our current fax server configuration is designed to automatically send the incoming faxes to a dedicated email fax dispatcher in the form of pdf files. The fax dispatcher will distribute these faxes to the right recipient through email as well.

7 Windows Fax Client

7.1 Windows HylaFAX Client(WHFC)

WHFC is a Client for the network fax server HylaFAXTM under Windows 95/98 and Windows NT/2000.

WHFC is available under the GNU Public license and can be downloaded from http://www.uli-eckhardt.de/whfc.

Figure 3 shows the screen shot of WHFC on Windows machine.

7.1.1 System Preferences

For setting up the client's system preferences, click on $Fax-\delta System$ preferences. A similar windows will look similar to Figure 4. The information you need from your Administrator are the following:

Fax server's name or IP addressSamba's shared directory for received faxes

As you can see, in Figure 4, the fax server's IP address is 192.168.0.38. For the "Program and arguments for viewing received faxes", type in the following:

Bart Simpson E-Hail Fax@bart.simpson.1.byname plaFAX scheduler on tehran: Running and idle plaFAX scheduler on tehran: Running and idle - - No Jobs available - - sto Update Sendqueue -	Logs			
ame Bart Simpson E-Hail Fax@bart.simpson.1.byname ylaFAX scheduler on tehran: Running odem ttyS0 (+1.425.644.2886): Running and idle - No Jobs available - sto Update Sendqueue □	8	R D		
JLaFAX scheduler on tehran: Running Jden ttyS0 (+1.425.644.2886): Running and idle - No Jobs available - uto Update Sendqueue □	me Bart Simpson	n	E-Mail	fax@bart.simpson.1.byname
- No Jobs available -	laFAX scheduler o	n tehran: Running	afbi ho	
- No Jobs available -	uen (1938 (+1.425	.044.2000). Numiting al	iu iure	
ito Update Sendqueue 🗖				
ito Update Sendqueue 🗂	- No Jobs availa	ible -		
ito Update Sendqueue 🗖	- No Jobs availa	ble -		
uto Update Sendqueue 🗖	- No Jobs availa	ble -		
	<u>- No Jobs availa</u>	ble -		
	- No Jobs availa ito Update Sendque	ue 🗖		

Figure 3: WHFC Screen Shot

C:\Program Files\Windows NT\Accessories\ImageVue\kodakimg \\192.168.0.38\recvq\%s

This means you can view an incoming fax using Kodak Image software that comes standard with Windows 2000.

7.1.2 User Preferences

Setting up the sender's information is done through user preferences. Click on Fax- λ User Preferences and a window similar to Figure 5 appear.

7.1.3 Logs File

To setup a log file, click on Logs-iDenine Log. Type in the log filename that is assigned by your administrator. Move the slider for "Keep log file for" to the maximum. See Figure 6. This log file will keep all of the sent faxes activity. To view the log file, click on Logs-iView Log.

7.2 Cypheus

Cypheus is another HylaFAX client for Windows and it has more features than WHFC. Cypheus is a commercial software and the costs depend on how many license you would like to acquire. For 1-9 license, the cost is \$34 per license (as of July 17, 2003). To buy the license, go to their website at http://www.cypheus.de/frm_home_e.htm.

7.2.1 Main Windows

To start Cypheus, on your computer desktop, double click on Cypheus icon. A Logon icon will appear (similar to Figure 7.)

Fax host			Miscellaneous settings		
Hostname	192.168.0.38		Update interval 60		
Port No.	4559		Check doneq 0		
Job format	%-4j %3i %1a %6.6	o %12.12e %5P %5D %7z %			
Max. Dial	12 Ma	x. Tries 3	Old Cover Page		
			Stay in Taskbar		
I♥ Local I	ime		Work in offline mode		
WHFC Fai	k printer installed		Use ODBC		
Spool Dire	ectory	NT\TEMP	Valid Dialstring char		
Settable in dialog	n the printer		#+- ,		
Remove	printer control sequer	nce 🔽	Phonebook separator		
System					
Spooldirect	tory for offline mode	C:\DOCUME~1\pinneke\L	OCALS~1\Temp\		
Searchpath	n for language dll's	C:\WINNT\System32\	Cancel		
Distance in the	d arguments for				

Figure 4: WHFC System Preferences

lame :	Bart Simpson		-	 Defaultsettings 	for Faxcover from section
.ogin :	bart		-	FaxNumber :	305-555-5555
-Mail :	fax@bart.simp	son.1.byname.net	-	VoiceNumber:	305-999-9999
axcover :			- 🕞	Company	XYZ Co.
Language	No language n	nodules installed 🛛 💌	_	Location	Springfield, NT
Send E-Mail-		1		Pagesize	
Send E-Mail C None		Use Faxcover 🔽		Pagesize	
Send E-Mail C None C When d	lelivered	Use Faxcover 🔽 Fine Print 🗖		Pagesize	

Figure 5: WHFC User Preferences

Define log	
Filename :	C:\temp\whfc.log
-	Keep Log for 40 days
	Keep Log for 40 days
	OK

Figure 6: WHFC Log File

To change/add server, enter IP key.	number or name and press TAB
Server	192.168.0.38
Display Name	My Fax Server
Port	4559
User Name	bart
Password	***
	Use FTP Passive mode
	T Autologon
	🗂 Login as Admin
California and California and California	5

Figure 7: Cypheus Logon Window

gu . D. O Haria Man Daar	e Astorian for Freedom	🖫 . 🌚	Prevent Crothous Ad	es tox de) 💇 rgs Est	
🕽 Tehran - Fax Server	T Image	Time	Sander	Pages	Owner	1
sign Trahow	🖸 fax00000 th	Mon03FV4		2	10	
Genada 🤤	tax33049.th	Sat04PM	425 (543525	1	22	
Se Cent Items	tax30048 th	BI03PM		1	50	
Di arts	tax10046 tit	Fr11AM	Caneway-thy54	2	10	
a reaction and	C fai 10045 18	FrittAM.	Taneway-try54	2	10	
	🖾 fa:00044.1/	In116M	Daneway-tty04	3	10	
	🖾 fac00043 bf	In11AM	Lateway-UsCH	2	10	
	🖸 fai 00042 tri	11Jun09	15 Comen, Inc.	6	10	
	🗖 fax30041 tri	02Jun03	425 609 3599	1	10	
	🖸 fax00040 tri	613un03		1	10	
	🔄 fax 300 30 th	013Jan08		1	70	
	tax 000.38 th	013.003		1	10	
	Ed tax00037.1#	30May03		1	2E	
	🔛 fa:00036 tif	30May03		1	:0	
	🖾 fac10005 tif	30Nay03		1	10	
	🖾 fa:00004 lif	00MeW00		1	10	
	🖾 (a:00000 tri	SOMEVOD		1	10	
	🖾 fa=00032 tri	12May03		1	10	
	🖸 fax33031 ttf	13May03		1	10	
	🖬 fax00030 tti	13Ma/03		1	.0	
	🖬 fax000.20 th	13May03		1	10	
	11 80000 at 12	15May03		1	40	
	tay 00027 tit	15May03		4	10	
	🔁 fa:30026.1ff	15May03		1	:0	
	🖸 fa:00025 tif	10May00		1	10	
	🖾 fas00024 hf	12Mey03		1	26]	
	🖸 fax00023 tif	13May03		1	10	8
alaritik scheduler om te	francikureng		2012/00/07/07/2012			1

Figure 8: Cypheus Main Window

The Main Window is similar to Figure 8. You see a list of all incoming, outgoing and sent faxes and HylaFAX status in the main window.

All information are refreshing at an user defined period.

7.2.2 Fax Viewer

The fax viewer shows the individual pages of received and sent documents. You may add comments, graphics and pages, delete pages and scan new documents if a scanner is attached.

In addition you may forward any document by e-mail or fax.

7.2.3 Send Fax

To send fax, click on the "New Fax". The send fax window will look similar to Figure 9.

First choose document(s), then enter a fax number and other information or choose receivers out of your address books. You may add a cover page, a tag line and an overlay and edit all other options.

Before sending the fax you may open a preview window and add some last changes and comments.

7.2.4 Settings

You are able to enter all user and server related information here, viewing and eMail notification options, too.

You may register as many cover pages as you want for later use and save some country specific dial options as well as the default values of Fax Info Center.

	, t	Documents	V:\tmp\2002-refi. V:\tmp\article-rim V:\tmp\cover.ps	doc BBPatent.pdf		0
Documents	Use Cover Page			V:\tmp\cover.ps		
Address Book	Caler ID				<u>×</u>	
<pre> </pre>	 Second second 	Job Info	Test on Friday			
Send Fax		Subject	Your requested D	ocuments		
100			High Resolution	E		
View & Send	F	ax Number				
101	Vame	Fa	x Number	Company	Ť	8
Save as	Karen	23	4-777-7777	KLMN		
Draft	Larry	55	5-9090	Co.		
Cancel	•				•	
Carles		Use this m	odem for sending t	fax	Ŧ	
	ĸ	ob Kill Time	3 🕂 h	Priority	127 -	
	🖙 Send at		7/18/20	03. 1	15:15	h
	Print all fax in o	ne sinale re	port.			

Figure 9: Cypheus Send Fax Window

7.2.5 Creating Fax Cover

You may create professional looking cover pages or documents using the built-in text/cover page editor. Documents can be send directly, if you have added the appropriate paragraph formats or fields.

The editor includes all functions of a big word processor, e.g. table editor, integration of graphics and OLE objects, style sheets and editable templates.

8 Unix Client

To submit a fax job for transmission on a Unix client, *sendfax* command is used.*sendfax* submits one or more fax transmission requests to a HylaFAX fax server. Example of use are demonstrated below:

```
The command line has the form of:
sendfax [options] [files...]
The simplest form of sendfax:
sendfax -d 5551212 /tmp/sample
```

For more options, see sendfax manual page.



Figure 10: Cypheus Text Editor