

HylaFAX Enterprise Installation Guide

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1. Summary

The recommended method for installing HylaFAX Enterprise is by downloading the Appliance ISO and installing that on a new bare metal or virtual machine.

The HylaFAX Enterprise Appliance ISO can be downloaded here:

<ftp://ftp.ifax.com:21/pub/server/appliance/hylafax-enterprise-appliance.iso>

The HylaFAX Enterprise Appliance Quickstart Guide can be found here:

http://www.ifax.com/quickdocs/hylafax_appliance_quickstart.pdf



The Appliance ISO is based on CentOS 7 64-bit.

1.1. Minimum Hardware requirements

- Intel Core 2.8 GHz or higher
- 2 GB RAM
- 100 GB Hard drive

1.2. Operating Systems supported

- RedHat Enterprise Linux 7 (64-bit)
- CentOS Linux 7 (64-bit)
- Oracle Enterprise Linux 7 (64-bit)

1.3. Conventions Used in this Guide

All relative paths in this document are relative to the HylaFAX \$SPOOL directory: */var/spool/hylafax/*

Therefore, *etc/config* is located at: */var/spool/hylafax/etc/config*



This guide is for HylaFAX Enterprise 6.x on RHEL/Oracle/CentOS 7.

1.4. SQL Database Support

For database setup instructions, see the HylaFAX Enterprise ODBC Quick Start Guide:

http://www.ifax.com/quickdocs/hylafax_odbc_guide.pdf

1.5. Manual Installation

HylaFAX Enterprise can be manually installed using the iFAX Solutions YUM repository on a minimal install of RHEL 7, CentOS 7, or Oracle Enterprise Linux 7.

Use the following commands to perform the install:

```
# rpm -ivh http://repo.ifax.com/yum/ee-6.2/ifax-ee-6.2.rpm
# yum install epel-release
# yum update
# reboot
# yum install hylafax-enterprise-appliance
# systemctl start hylafax-enterprise-appliance
# /usr/sbin/attach-console
```

Afterwards, follow the Appliance Quickstart Guide for the initial setup procedure.

2. License Activation

Your serial numbers can be easily activated via the Appliance console interface.

To manually activate your permanent (HFEB, HFCB, HFCH) or evaluation (EVEB) HylaFAX Enterprise serial numbers, run:

```
# /var/spool/hylafax/ifax/bin/register
```

Run `/usr/sbin/lmstat -a` to check the status of the licence server. If all went well, the output should look something like:

```
lmstat - Copyright (c) 1989-2008 Aceso Software Inc. All Rights Reserved.  
Flexible License Manager status on Thu 5/28/2009 05:16
```

```
License server status: 27000@myfaxserver  
License file(s) on myfaxserver: /etc/ifax/eval-server.lic:
```

```
myfaxserver: license server UP (MASTER) v11.15
```

```
Vendor daemon status (on myfaxserver):
```

```
ifax: UP v11.15
```

```
Feature usage info:
```

```
Users of HFaxD: (Uncounted, node-locked)
```

```
Users of FaxQueuer: (Total of 1 license issued; Total of 0 licenses in use)
```

```
Users of FaxGetty: (Total of 2 licenses issued; Total of 0 licenses in use)
```

```
Users of FaxSend: (Total of 2 licenses issued; Total of 0 licenses in use)
```

```
Users of barcode: (Uncounted, node-locked)
```



If you have an error, make sure that the fax server is able to lookup its own hostname in DNS and check `/var/log/hylafax/lmgrd.log` for details.

3. Configure Brooktrout

The Brooktrout TR1034 and SR140 can be easily configured via the Configure Telco Connections area of the Appliance console.

If you're not using Brooktrout hardware or software you can skip this section.

3.1. Configure TR1034 T1/PRI Support

Edit *ifax/bt/config/callctrl.cfg* and uncomment the section that applies to the type of TR1034 fax board that you have. For example, the section to uncomment for a PRI T1 circuit would be:

```
[module.0]
  pcm_law=mulaw
  auto_connect=true
[module.0/clock_config]
  clock_mode=master
  clock_source=TrunkA
[module.0/port.1]
  emulation=CPE
  port_config=T1_ISDN
  line_coding=B8ZS
  protocol=ATT
  max_did_digits=5
  did_timeout=10
# reject_incomplete_did=false
# default_caller_id=12344
#[module.0/port.2]
# emulation=CPE
# port_config=T1_ISDN
# line_coding=B8ZS
# protocol=ATT
# max_did_digits=5
# did_timeout=10
```

A few notes about this section:

- The "protocol" parameter should correspond to the type of PRI your telco has provisioned. The default ATT means AT&T 4/5ESS. Another common setting for the "protocol" line is **ISDN2** (National ISDN).
- The settings in section "module.0" are global in scope. If you have two TR1034's in a server, only module.0 needs to be configured. However, if the TR1034's are used for different purposes the modules must be configured separately.
- The last two lines of the port.1 section are still commented. These are optional settings that you

may wish to tune.

- The entire [module.0/port.2] section is commented. This will always be the case, since the TR1034 boards rarely support a second T1/E1.



To discover which module your board is configured as, run `ifax/bt/bin/modinfo` for details. You will see something like "03: hw; 25 chans; ordinals 0- 23;..." which, in this case, means the module is 3.

3.2. Configure TR1034 Analog Support

As a second example, here's what should be commented out for a TR1034+P2-2L (2-line analog loop start board):

```
[module.0]
[module.0/port.1]
  port_config=analog
  protocol_file=ifax/bt/config/analog_loopstart_us.lec
  num_rings=2
  input_gain=0
  output_gain=0
  caller_id=enabled
  country=bt/tr1034/config/us600.qslac
[module.0/port.2]
  port_config=analog
  protocol_file=ifax/bt/config/analog_loopstart_us.lec
  num_rings=2
  input_gain=0
  output_gain=0
  caller_id=enabled
  country=ifax/bt/config/us600.qslac
#[module.0/port.3]
# port_config=analog
# protocol_file=ifax/bt/config/analog_loopstart_us.lec
# num_rings=2
# input_gain=0
```



Only two ports have been uncommented for this 2-line board

3.3. Country Code

If you're using the TR1034 outside of the USA, the "country_code" setting in *ifax/bt/config/btcall.cfg* must be changed to match your country code. Refer to the chart below for the code to use.

For example, users in the UK would use the following:

```
country_code      0440
```

Country	Code	Country	Code	Country	Code
USA	0010	Canada	0011	UK	0440
Algeria	2130	American Samoa	6840	Andorra	0330
Argentina	0540	Aruba	2970	Australia	0610
Austria	0430	Bahrain	9730	Belgium	0320
Belize	5010	Bolivia	5910	Brazil	0550
Cameroon	2370	Chile	0560	Colombia	0570
Costa Rica	5060	Cyprus	3570	Czech Republic	0420
Denmark	0450	Ecuador	5930	Egypt	0200
El Salvador	5030	Ethiopia	2510	Fiji	6790
Finland	3580	France	0330	French Antilles	5960
Guadeloupe	5900	French Polynesia	6890	Gabon	2410
Germany	0490	Greece	0300	Guam	6710
Guantanamo Bay	0530	Guatemala	5020	Guyana	5920
Haiti	5090	Honduras	5040	Hong Kong	8520
Hungary	0360	Iceland	3540	India	0910
Indonesia	0620	Iran	0980	Iraq	9640
Ireland	3530	Israel	9720	Italy	0390
Italy PBX	0391	Ivory Coast	2250	Japan	0810
Jordan	9620	Kenya	2540	Korea	0820
Kuwait	9650	Liberia	2310	Libya	2180
Liechtenstein	0410	Luxembourg	3520	Malawi	2650
Malaysia	0600	Mexico	0520	Monaco	0330
Morocco	2120	Namibia	2640	Netherlands	0310
Neth. Antilles	5990	New Caledonia	6870	New Zealand	0640

Country	Code	Country	Code	Country	Code
Nicaragua	5050	Nigeria	2340	Norway	0470
Norway X	0471	Oman	9680	Pakistan	0920
Panama	5070	P.N. Guinea	6750	Paraguay	5950
Peru	0510	Philippines	0630	Poland	0480
Portugal	3510	Qatar	9740	Romania	0400
Russia	0070	Saipan	6700	San Marino	0390
Saudi Arabia	9660	Senegal	2210	Singapore	0650
Slovakia	0420	South Africa	0270	Spain	0340
Sri Lanka	0940	Suriname	5970	Sweden	0460
Switzerland	0410	Taiwan	8860	Thailand	0660
Tunisia	2160	Turkey	0900	UAE	9710

3.4. SR140 Support

Edit *ifax/bt/config/callctrl.cfg* and uncomment the "**module.41**" section. Module 41 will always be used for the SR140 virtual device.

Here's what an example configuration looks like:

```
[module.41]
  channels=3
[module.41/ethernet.1]
  ip_interface=eth0
#  media_port_min=56000
#  media_port_max=57000
[module.41/host_cc.1]
  host_module=1
  number_of_channels=60
```

3.5. Brooktrout T.38 with SIP Support

Edit *ifax/bt/config/callctrl.cfg* and uncomment the section that applies to T.38 (SIP/H.323).

Here's what an example configuration looks like:

```
[host_module.1]
  module_library=/usr/lib/ifax/brktsip_mt.so
  enabled=true
[host_module.1/parameters]
  sip_from=sip:myuri@example.com
  sip_default_gateway=10.0.0.2:5060
  sip_username=tr1034
```

3.6. Brooktrout T.38 with H.323 Support

You can see some recommended H323 settings in: *ifax/bt/config/callctrl_h323.cfg*

We recommend you make a copy of this file as follows:

```
# cp /var/spool/hylafax/ifax/bt/config/{callctrl_h323.cfg,callctrl_custom.cfg}
```

and then edit *callctrl_custom.cfg* to be appropriate to your environment.

Afterwards edit the *btcall.cfg* file and set:

```
call_control ifax/bt/config/callctrl_custom.cfg
```

3.7. Start the Brooktrout service

Once the *callctrl.cfg* file has been configured, restart the Brooktrout service by doing:

```
# systemctl restart hylafax-bt
```



You can monitor PRI/T1 and SIP/H.323 activity by viewing the *tmp/ecc_trace.txt* file.

3.8. Start the *btgetty* processes

Start a *btgetty* process for each boston channel. The commands below use *boston00*:

```
# ln -s /usr/lib/systemd/system/hylafax-btgetty@.service \
/etc/systemd/system/hylafax.service.wants/hylafax-btgetty@boston00.service
```

```
# systemctl start hylafax-btgetty@boston00
```

If you have more boston devices (e.g. *boston01*, *boston02*, *boston03*), then simply substitute the channel in the commands above.



For every channel configured above you must have a matching */var/spool/hylafax/etc/config.bostonXX* configuration file.

3.9. Update Modems in Web Interface

Synchronize your devices with the web interface by executing the following:

```
# web-sync-update.php
```

3.10. Dialogic Brooktrout manual

You can find more information about configuring 'callctrl.cfg' in the "Dialogic Brooktrout Bfv APIs Reference Manual":

http://www.dialogic.com/webhelp/Brooktrout/SDK69/ref_apiset.pdf

You'll want to focus on these areas:

- Call Control Configuration File, page 1158
- Examples of PSTN Call Control (callctrl.cfg) Files, page 1282
- IP Call Control Configuration Examples, page 1293

3.11. T.38 vs G.711

Here's a document that will help you understand the (subtle but important) considerations when selecting G.711 versus T.38 operating modes with the Dialogic SR140 technology embedded in our product:

<http://www.dialogic.com/~media/products/docs/whitepapers/12687-t38-g711-foip-wp.pdf>

4. Mainpine Modem Configuration

4.1. Disable Brooktrout Devices

If you're not going to use the Brooktrout devices at all, disable them using the following commands:

```
# systemctl disable hylafax-bt
# systemctl stop hylafax-bt
# rm /var/spool/hylafax/FIFO.boston*
# rm /etc/systemd/system/hylafax.service.wants/hylafax-btgetty*
```

4.2. Configure the kernel

Make sure the kernel is giving you enough serial ports for your modems to use.

Edit */etc/default/grub* and append **8250.nr_uarts=16** to GRUB_CMDLINE_LINUX.

Example:

```
GRUB_CMDLINE_LINUX="crashkernel=auto rd.md.uuid=d9201b0c:0bf5baf8:2e10d651:21f6a183
rd.lvm.lv=hylafax-ee_persephone/root rd.md.uuid=61d531d1:0126df9b:1bc1b7a6:5efefc0c rhgb
quiet 8250.nr_uarts=16"
```

If you have more than 16 modem ports in total, you'll need to use a larger number (e.g. 24) when configuring the number of uarts that the kernel should provide.

Execute:

```
# grub2-mkconfig -o /boot/grub2/grub.cfg
```

Afterwards, reboot the server.

With the following command you can verify whether all of the modem ports are recognized:

```
# cat /proc/tty/driver/serial
```

4.3. Start the `faxgetty` processes

Start a `faxgetty` process for each modem port. The commands below use `ttyS4`:

```
# ln -s /usr/lib/systemd/system/hylafax-faxgetty@.service \  
/etc/systemd/system/hylafax.service.wants/hylafax-faxgetty@ttyS4.service  
  
# systemctl start hylafax-faxgetty@ttyS4
```

If you have more ports (e.g. `ttyS5`, `ttyS6`, `ttyS7`), then simply substitute the modem port in the commands above.



For every modem port configured above you must have a matching `/var/spool/hylafax/etc/config.ttySX` configuration file.

4.4. Update modems in Web Interface

Synchronize your devices with the web interface by executing the following:

```
# web-sync-update.php
```

5. Configuring Inbound FAX Routing

Inbound FAX routing is easily configured the "Configure DID/DTMF Routing" section of the Admin Settings area in the Web Interface.

5.1. FAX to Email

HylaFAX invokes the `bin/faxrcvd` notification script whenever a facsimile is received, and the configuration sends email to the *FaxMaster* user describing the content of the facsimile and other useful information such as the time spent receiving the document. By modifying the default configuration file `etc/FaxDispatch` to set `SENDTO` to a different email address, this script can route facsimile directly to the intended recipient.



If `/var/spool/hylafax/etc/FaxDispatch` doesn't exist, you should create it with permissions 644 and owned by user `hylafax`.

5.1.1. Basic Rules

```
FROMADDR=faxserver@example.com
FILETYPE=pdf

# By CallerID
case "$CALLID1" in
  2125551234) SENDTO=jack@example.com,jill@example.com;; # send to both jack and jill
  2125553456) SENDTO="joe@example.com"; FILETYPE=tif;; # joe wants TIFF instead of PDF
  *) SENDTO=catchall@example.com;; # send everything else here
esac

# By DID/DTMF
case "$CALLID2" in
  6001) SENDTO=jack@example.com,jill@example.com;; # send to both jack and jill
  6002) SENDTO="joe@example.com"; FILETYPE=tif;; # joe wants TIFF instead of PDF
  *) SENDTO=catchall@example.com;; # send everything else here
esac

# By Device
case "$DEVICE" in
  ttyS4) SENDTO=john@example.com;; # all faxes received on ttyS4
  ttyS5) SENDTO=mary@example.com;; # all faxes received on ttyS5
  ttyS6|ttyS7) SENDTO=will@example.com;; # all faxes received on ttyS6 and ttyS7
esac
```




When using multiple analog lines, you can determine which port the fax number is connected to by running `watch faxstat` and then calling the fax numbers with your phone.

Your modifications will be effective the next time you receive a fax. For more details, see the `faxrcvd` and `faxinfo` manpages.

5.1.2. Using LDAP/AD

Route the fax to email based on the DID listed for users in LDAP (or Active Directory):

```
LDAPEMAIL=`ldapsearch -LLL -x -D "CN=Fax Server,OU=System Accounts,DC=Example,DC=com" \
-y /etc/ldap.secret "facsimileTelephoneNumber=*$CALLID2" mail | grep "^mail:" | \
cut -f 2 -d ' ' | awk '{ str1=str1 $0 "," }END{ print str1 }'`

if [ -n "$LDAPEMAIL" ]; then
    SENDTO=$LDAPEMAIL
fi
```

You must update the LDAP connection parameters (ie: LDAP host, BaseDN, etc) in the command above.



`ldapsearch` is part of the 'openldap-clients' package.

Place your ldap password in `/etc/ldap.secret` using the following commands:

```
# printf "P@ssw0rd" > /etc/ldap.secret
# chmod 0600 /etc/ldap.secret
# chown hylafax /etc/ldap.secret
```



The `SENDTO` variable is only set if there is a result from the `ldapsearch`. Otherwise, the value set for `SENDTO` in `FaxDispatch.appliance` will be used. That's why it's important that the code above comes after the `". etc/FaxDispatch.appliance"` line.

5.2. Printing Received Faxes

To install the CUPS print queue software, run:

```
# yum -y install cups system-config-printer
```

```
# systemctl start cups
```

```
# cupsctl --remote-admin
```

Edit `/etc/cups/cupsd.conf` and add this as the first line:

```
DefaultEncryption Never
```

Under `<Location /admin>`, remove the line:

```
Encryption Required
```

If the HylaFAX server is not located on your same network, you must also execute the following command:

```
# sed -i -e 's/Allow @LOCAL/Allow All/' /etc/cups/cupsd.conf
```

Restart CUPS

```
# systemctl restart cups
```

Allow connections to CUPS through the local firewall:

```
# firewall-cmd --zone=public --permanent --add-service=ipp
```

```
# firewall-cmd --reload
```

Afterwards, you can access the CUPS web interface by pointing your browser to port 631 of your hylafax server's IP address. For example: <http://192.168.1.10:631>

To add a printer, click on the "Add Printer" button and follow the prompts. CUPS will request that you login with the `root` account and the root password you specified during the Appliance installation.

To print faxes as they arrive, add the following to `etc/FaxDispatch`:

```
PRINTER=myprinter  
fax2ps $FILE | lpr -P$PRINTER
```

Substitute "myprinter" for the actual printer name configured on your server.

5.3. Copying the FAX

To copy a fax in PDF format to another directory (ie: a SAMBA share), use the following in *etc/FaxDispatch*:

```
DATE=$(date +%Y/%m)
TIFF2PDF=/usr/bin/tiff2pdf
SHAREDIR=/media/smbshare

if [ -f $FILE ]; then
  mkdir -p $SHAREDIR/$DATE
  # cp $FILE $SHAREDIR/$DATE/$FILENAME.tif
  # Copy the fax with filename format DID-FILENAME.pdf
  $TIFF2PDF -o $SHAREDIR/$DATE/$CALLID2-$FILENAME.pdf $FILE
fi
```

5.4. Barcode Decoding

Barcode support is provided by the `bardecode` application located at `/var/spool/hylafax/bin/bardecode`. Supported barcode types include code39, code128, upca, upce, ean8, code25, ean13 and codabar.

Example usage:

```
# bin/bardecode -t any -f $FILE
```

Execute `bin/bardecode` for more information.

6. Sending Faxes

6.1. Client Software

There are many applications available for sending faxes with HylaFAX. However, in this document, we will give you an overview of `sendfax`, HylaFSP, the HylaFAX Enterprise Web Interface, HylaFAX Lite for iPhone, and custom applications.

6.1.1. `sendfax`

HylaFAX includes a command line program called `sendfax` for sending faxes. Typical usage would be something like:

```
$ sendfax -f "myname@mydomain.com" -R -r "faxsubject" -c "coverpage comments" -x "Recipient's company" -d "Recipient@1234567" tofax.pdf
```

where `myname@mydomain.com` is a valid e-mail address for the sender, 1234567 is the number where to fax, and `tofax.pdf` is the image file to be faxed. Standard HylaFAX-compatible file formats are ASCII, TIFF, PostScript, and PDF. Be aware that `sendfax` is capable of handling multiple `-d` options and that only the options that precede it apply to that instance of the `-d`. In most cases the `-d` option is the last option that should be used. See the `sendfax` manpage for more information.

6.1.2. HylaFSP

HylaFSP is an extremely lightweight client for Microsoft Windows and macOS that offers a tightly integrated, completely native faxing experience. It's perfect for non-technical users and allows you to fax from any application you can print from. On Windows, it even integrates with Windows and Outlook Address Books!

For more information, visit us online:

<https://www.ifax.com/products/hylafsp/>

6.1.3. HylaFAX Enterprise Web Interface

The HylaFAX Enterprise Web Interface is a web-based application that allows users to easily view, send and archive faxes in PDF format. It also allows administrators to manage users, their permissions, transmission lines, fax categories, and more.

To enable HylaFAX Enterprise Web Interface, see the following guide:

https://www.ifax.com/quickdocs/hylafax_web_admin_manual.pdf

6.1.4. HylaFAX Lite for iPhone

HylaFAX Lite is a HylaFAX client application that allows you to:

- Keep track of your HylaFAX server's current status
- View received faxes and share them in PDF format
- List and cancel jobs in the outbound queue
- Use iTunes File Sharing to access the fax files you've downloaded onto your device
- Add an unlimited number of HylaFAX server accounts



This app must be used in conjunction with a HylaFAX server. In order to access a HylaFAX server on a private network (ie. LAN), a specially configured firewall (or VPN) may be required.

For details, see:

<https://www.ifax.com/products/hylafax-lite/>

6.1.5. Custom Client Application

Should you desire to write your own client application for submitting faxes to HylaFAX, below are sample applications in .NET and Java:

- .NET sample client <http://people.ifax.com/~david/dotnetsample.zip>
- Java sample client <http://people.ifax.com/~david/javasample.zip>



The HylaFAX client protocol only supports PDF, TIFF, and PostScript documents for faxing. Any other file type should be converted to one of these formats before used with your own custom client application.

6.2. Email to FAX Gateway

The initial Email to FAX configuration should be performed via the Appliance console interface.

Email to FAX is simply a matter of Postfix receiving an email and handing it off to the faxmail program. Postfix is the email server that receives the email, and faxmail is a program included with HylaFAX for processing email messages and submitting them to HylaFAX for faxing.

6.2.1. Add an Additional Domain

To add an additional domain to your Email to FAX configuration, you must append your new domain to the list of domains configured for "relay_domains" in */etc/postfix/main.cf*. For example:

```
relay_domains= fax.mycompany.com myfaxdomain.com
```

Afterwards, add a new entry to */etc/postfix/virtual_alias-fax* for the new domain. For example:

```
/^([+]?[0-9*#.-]+)@myfaxdomain\.com$/ $1@fax.localhost
```

Restart Postfix and send a fax to the new domain:

```
# postfix reload
```

6.2.2. Ignore Email Body

If you would like to ignore the email body of an Email to FAX message, execute the following command:

```
# ln -s /bin/true /usr/sbin/faxmail/text/plain
```

That file tells faxmail to ignore "text/plain" email attachments, which is what the email body consists of. Simply delete */usr/sbin/faxmail/text/plain* and faxmail will send the email body in addition to any other plain text files in the email to HylaFAX for faxing.

Also create */etc/hylafax/faxmail.conf* with the following content to disable the email headers from appearing in the fax:

```
AutoCoverPage: false
TextPointSize: 12pt
Headers: clear
MailUser: faxmail
TrimText: yes
```

6.2.3. Increase Postfix message size

To review the current maximum message size limit, run:

```
# postconf message_size_limit
```

To increase the max message size limit, run:

```
# postconf -e message_size_limit=20480000
```

```
# postfix reload
```

6.3. Specifying Default Outbound Devices

If you'd like to configure HylaFAX to only use a specific number of channels for sending outbound, you can add the "ModemReadyState" parameter to the `/var/spool/hylafax/etc/config.bostonXX` files in order to control whether or not the device is assigned to outbound jobs.

For example, if you want to dedicate boston00 to boston10 for receiving faxes only, thus allowing boston11-22 to both send and receive faxes, then you would add the following setting to files `etc/config.boston00` to `etc/config.boston10`:

```
ModemReadyState: D
```

That will tell HylaFAX not to use boston00 to boston10 for outbound jobs. For details, please see the `hylafax-config` manpage.

After making the configuration change, run the following to restart the `btgetty`'s so that they immediately reload their configuration:

```
# for i in /var/spool/hylafax/FIFO.*; do echo Q > $i; done
```

The `echo Q` will restart them gracefully, meaning that if they are receiving a fax, they will restart only after they're done.

6.4. Pausing the Outbound Queue

To pause the outbound queue, edit `/var/spool/hylafax/etc/config` and add the following line:

```
ModemGroup: "any:HOLD"
```

and save your change. This change will be effective automatically.

To re-activate the outbound queue, simply comment out that line by using an #:

```
#ModemGroup:          "any:HOLD"
```

Save your change and execute:

```
# echo Z > /var/spool/hylafax/FIFO
```

6.5. Automatically Dialing 9

See the HylaFAX Enterprise Appliance Quickstart guide for details on configuring the dialing rules.

6.6. Faxing Microsoft Office documents

HylaFAX relies on the LibreOffice Suite to convert Microsoft Office documents to PDF format before the document can be faxed. Keep in mind that LibreOffice may not always convert a document as expected. Ideally you would simply use PDF in order to be certain that the document is faxed as intended.

To setup LibreOffice, use the following script:

<http://people.ifax.com/~david/scripts/setup-libre.sh>

6.7. Adding JPEG support

To add jpeg support, replace the following line in */etc/hylafax/typerules*:

```
>6 string JFIF error JPEG support not configured
```

with this line:

```
>6 string JFIF ps jpegtopnm < %i | ppmtopgm | pnmscale -ysize %w %l | pnmtops -dpi %R  
-equalpixels > %o
```

Once you've saved the typerules file, the changes are effective immediately.

Keep in mind that every single file submitted to HylaFAX will be faxed as a separate page. Therefore, if you need the images to appear in a specific layout, you may want to consider only faxing images that are embedded inside an PDF file.

Furthermore, for the best results, use only black and white images, and not greyscale.

6.8. Replacing "HylaFAX Enterprise" with your Company Name

The setting you'll want to change is called the LocalIdentifier, and it is also used as the TSI ID. The default LocalIdentifier is easily configured in the "Configure HylaFAX Enterprise" area of the Appliance console.

It is possible to dynamically change the LocalIdentifier (TSI ID) and Caller ID (Calling Party) by using a JobControl script. You can install a script that uses the user's Web Interface account settings (ie. Fax Number, TSID) and applies them to the outbound job based on the username of the account that sent the job (ie. when using HylaFSP or the Web Interface) or based on the email address if the job was submitted via Email to FAX (the email must match an account in the Web Interface). If a web interface account doesn't exist for the user that sent the fax, the system default LocalIdentifier and Caller ID will be used.

Use the following script to download and install the jobcontrol script:

<http://people.ifax.com/~david/scripts/install-jobcontrol.sh>



Regarding changing the Caller ID that appears when you make an outbound call, ask your telco whether they will honor your specified Calling Party Number. Analog lines are not supported.

6.9. Faxback Testing Service

While building the new HylaFAX Enterprise sever, there may be a need to test faxing to another fax server/machine. If a test machine is not available, a test fax can be sent to the iFAX Solutions' "faxback" server. This service allows our customers to send a test fax to 1-215-825-8792, and when the fax calls arrives, the faxback service will immediately fax the the first page of the inbound fax back to the CallerID number provided on the inbound fax call.

To initiate, and if calling within the United States or Canada, please send faxes to the following fax number: 1-215-825-8792. After completion, log into the HylaFAX Enterprise web interface as Admin and check the Inbox for the faxback fax.

If outside the United States or Canada, please use a known working local fax machine or hosted fax service for your testing.

7. Setting up Client Access

7.1. User Accounts

It is necessary to specify which client machines and users can have access to a HylaFAX server machine. This is specified by the contents of the *etc/hosts.hfaxd* file. The contents of this file is specified in the *hosts.hfaxd(5F)* manual page. The default *etc/hosts.hfaxd* file that comes with HylaFAX permits anyone to have access through the localhost network interface (loopback). Here is an example *hosts.hfaxd*:

```
localhost  
127.0.0.1
```

It is a good idea to refine the controls specified in this file before providing general access to the server. Access can be restricted both on a per-client-machine basis and by user. Passwords can also be required though support for this is presently somewhat awkward. The *etc/hosts.hfaxd* file must be owned by the fax user and be mode 0600 or the *hfaxd* daemon will not permit client access.

To enable everyone on your local '10.1.x.x' network, you can use the following example:

```
^.*@10\.\.1\.[0-9]{1,3}\.[0-9]{1,3}
```

If you trust your internal networks, a rule at the beginning of the *etc/hosts.hfaxd* file such as:

```
^.*@.*$
```

will allow any user password-less access to the server using any username they wish.

To create individual HylaFAX users, you must use the `faxadduser` command.

Example:

```
# faxadduser -p secret myuser
```

For more in-depth information, please see the `faxadduser`, `faxdeluser` and *hosts.hfaxd* manpages.

7.2. Removing Jobs from the Queue

In order to remove a job from the queue, you must set the `FAXUSER` environment variable to the owner of the fax job and then use `faxrm JOBID`.

Example:

```
# export FAXUSER=david
# faxrm 2007
```

To remove all jobs in queue for a specific sender, use the following script:

```
#!/bin/sh
for i in $(faxstat -s -O 'JobFmt: "%j %o"' | grep $1 | cut -f 1 -d ' ');
do
    FAXUSER=$1 faxrm $i;
done
```

Execute:

```
# ./script.sh david
```

7.3. Viewing Received Faxes

In order for client applications to access your received faxes, the TIF file permissions in the `recvq/` directory must be world-readable. This is accomplished by changing `RecvFileMode` in the `etc/CONFIG/site`.

Set the following:

```
RecvFileMode: 0644
```



You must also restart the `faxgetty` and/or `btgetty` processes as discussed in **Troubleshooting**.

Afterwards, execute the following command:

```
# chmod 0644 /var/spool/hylafax/recvq/*.tif
```

Your client should now have access to retrieve and display your received faxes.

8. Email Templates

By default, HylaFAX uses the *en* family of templates located in `/var/spool/hylafax/etc/templates/`. However, you should never edit a distributed template directly unless you don't mind losing your changes during HylaFAX upgrades. Therefore, you should copy the templates into a new directory and use that instead.

8.1. Text-based templates

To setup text-based templates, execute:

```
# cp -a /var/spool/hylafax/etc/templates/{en,custom}
```

Afterwards, you'll want to start off by editing the *faxrcvd-success.txt* and *notify-done.txt* files in the new `etc/templates/custom/` directory.

Finally, once your changes have been made to the template, you must configure `/var/spool/hylafax/etc/FaxDispatch` and `FaxNotify` to use your new templates. Add the following `TEMPLATE` variable as follows:

```
TEMPLATE=custom
```

Once you save the files, your changes will be applied the next time you send/receive a fax.

8.2. HTML-based Templates

You can easily switch to the HTML templates and customize them for your organization by following these steps:

Create a copy of the *html-sample1* template directory in `/var/spool/hylafax/etc/templates/` called *custom-html*:

```
# cp -a /var/spool/hylafax/etc/templates/{html-sample1,custom-html}
```

Add the following to your `etc/FaxDispatch` and `etc/FaxNotify`:

```
TEMPLATE=custom-html
```

Edit the font-family in the `css.inc` file to suit your needs.

Once you've saved the changes to `etc/FaxDispatch` and `etc/FaxNotify`, the new templates will be used the next time you receive and send a fax.

8.3. Replace HylaFAX Agent

You can easily replace all occurrences of "HylaFAX Agent" in the email templates with the following command:

```
# sed -i -e 's/HylaFAX Agent/My Fax Service/' /var/spool/hylafax/etc/templates/custom/*.txt
```

8.4. Change From Email

To change the email address that sends the email notifications for sent and received faxes, edit */var/spool/hylafax/etc/FaxDispatch* and *FaxNotify* and set:

```
FROMADDR=faxserver@example.com
```

Once you save your changes, they will be applied automatically to the next email notifications.

8.5. Disable Success Notifications to FaxMaster

To receive notifications for failed fax transmissions only, set the following in */var/spool/hylafax/etc/FaxDispatch* and *FaxNotify*:

```
NOTIFY_FAXMASTER=errors
```

To disable all fax transmission notifications to FaxMaster, use the following instead:

```
NOTIFY_FAXMASTER=never
```

Your changes are applied automatically.

9. Firewall Configuration

9.1. Default Ports

By default, your HylaFAX servers are listening to the following ports:

TCP 22	SSH access
TCP 25	Email to FAX submission
TCP 80	Web interface
TCP 4559	Fax job submission (see below) and fax status
TCP 27000 & 27059	HylaFSP Site License server
UDP 5060	SIP traffic
UDP 56000-57000	RTP/UDPTL media

HylaFAX uses an FTP-style protocol on port 4559. HylaFSP uses "PASV" (passive) transfers when transferring data to the HylaFAX server. As such, simply port-forwarding/tunneling port 4559 will not be sufficient. If you are not using normal IP connectivity between HylaFSP and HylaFAX, your firewall/border/tunneling has to do "FTP" fixups (or connection tracing/NAT) on the port it's forwarding. If you have Cisco PIX firewall, you need "FTP fixups" on port 4559.

9.2. Allow HTTPS

If you have installed an SSL certificate, you must open the firewall for HTTPS using the following commands:

```
# firewall-cmd --zone=public --permanent --add-service=https
```

```
# firewall-cmd --reload
```

10. Cron Jobs

The HylaFAX Enterprise packages install the following cron jobs:

- `/etc/cron.daily/hylafax`
- `/etc/cron.hourly/hylafax`

Please look over the defaults they setup, and customize as appropriate.

Routine housecleaning in the `recvq/` directory is performed by HylaFAX's `faxcron` program, which is executed daily from the `/etc/cron.daily/hylafax` crontab. For example, if you're looking to change the expiration time for received faxes, you'll need to edit the `faxcron` command in that crontab and to use the `-rcv` option along with the desired number of days.

Completed jobs (whether they were sent successfully or not) are stored in the HylaFAX `doneq/` directory, and there is a crontab that performs routine maintenance in that directory called `faxqclean`, which is executed from `/etc/cron.hourly/hylafax`. You can use the `-j` option to specify the job age threshold (in seconds) that controls how long jobs may reside in the `doneq/` directory before being removed.

For more in-depth information, see:

`$ man faxcron`

`$ man faxqclean`

11. Troubleshooting

11.1. Logs

When troubleshooting problems, it is important to take a look at the logs. HylaFAX creates a new session log file in *log/* for every fax transmission. See the *hylafax-log* manpage for specific error message information.

It may also be prudent to turn up "ServerTracing" in the *etc/config* file, and "SessionTracing" in the *etc/CONFIG/site* file. The normal debugging value would be 0xFFF. For increased low-level output, use 0xFFFFF. You must restart the *faxgetty* and *btgetty* processes after editing *etc/CONFIG/site*.

11.2. Restarting the *btgetty* and *faxgetty* processes

After making a configuration change to *etc/config.bostonXX*, *etc/config.ttySX*, or any of the files that those files include, run the following to restart the *btgetty* and/or *faxgetty* processes that read those configuration files:

```
# for i in /var/spool/hylafax/FIFO.*; do echo Q > $i; done
```

The *echo Q* will restart them gracefully, meaning that if they are receiving a fax, they will restart only after they're done.

11.3. Restarting the Brooktrout devices

To completely restart the Brooktrout TR1034 and/or SR140 execute:

```
# systemctl restart hylafax-bt
```


11.4. Performing a Packet Capture

You can perform the packet captures by running the following command before sending a fax:

```
# tcpdump -s0 -n -i eth0 -w /tmp/sip.pcap udp or icmp
```



If you're not using eth0 for SIP/T.38, replace eth0 with the name of your ethernet adapter (e.g. ens33, ens192, sit0, etc) in the command above.

Hit **Ctrl+c** to stop the capture when the call is complete.

You can view the status of the fax server by running the following command in order to know what it's currently doing in real time:

```
$ watch faxstat -s
```

Execute `gzip /tmp/sip.pcap` to compress the pcap file before sending it to us.

12. Uninstalling HylaFAX Enterprise

To uninstall HylaFAX Enterprise, run:

```
# yum remove hylafax-enterprise-appliance
```

13. Manuals

13.1. UNIX Man Pages

For a better understanding of the HylaFAX system, you'll want to read the following man pages:

- man hylafax-server
- man hylafax-client
- man hylafax-config
- man xferfaxlog
- man faxrcvd
- man notify
- man faxmail
- man hosts.hfaxd
- man faxadduser
- man faxdeluser

13.2. Manuals Online

You can also find the most comprehensive documentation online at:

<http://www.hylafax.org/content/Handbook>

and

http://www.hylafax.org/content/Man_Pages

14. Frequently Asked Questions

What are "Hangup: DCN received in Command-Receive" errors?

That basically means that the remote side sent us a DCN (disconnect) signal unexpectedly. There are many reasons for which they may have done this, ranging from someone on the sending side asking their fax machine to abort the transmission, to more problematic situations like bad phone line condition. One should only worry about these if they're consistently failing with a specific fax number—in that case there may be a problem that bears further examination. But if only a small number of these are seen, and if the same fax number that failed a few minutes earlier reconnects and successfully transmits a fax, then they're not worth worrying about. Occasional failures are a fact of life, but systematic errors are worth investigating.

What are "Invalid dialing command" errors?

In most cases, "Invalid dialing command" means that the telephone company or PBX rejected our call as invalid, or played us a 'your call cannot be completed as dialed' recording. Check the number and try again.

What about "No loop current" and "No carrier detected" errors?

The "No loop current" error happens when the fax modem is expecting a normal fax transmission but the remote side of the call hangs up instead. Regarding inbound calls, this usually occurs when someone dials the fax server's number and hangs up once they hear fax tones.

"No carrier detected" errors typically occur when the modem dials a number and establishes a connection but is unable to detect a "fax carrier" like a fax server or fax machine. In this case, the modem will eventually hang up and show the "No carrier detected" error. Should this happen, verify that the fax number is answered by a fax machine and not an answering machine or something else.

What are "BfvFaxEndOfDocument did not return in 600000ms" errors?

The BfvFaxEndOfDocument error occurs when a timeout of 10 minutes has elapsed after the last page is sent and before the end of transmission. This can occur when sending complex pages at slow speeds and/or when there are multiple Partial Page Requests (PPR), but this shouldn't occur frequently.

Some of our PDFs aren't being rendered properly as faxes. What can we do?

HylaFAX relies on ghostscript to render the PDF and PostScript files into the TIFF format for transmission. The default version of ghostscript distributed with your OS is likely to be an older version than what's currently available.

You can safely install a more recent version for use with HylaFAX by using the following script:

<http://people.ifax.com/~david/scripts/upgrade-gs.sh>

Afterwards, send a test fax.

What does "Blocked by Concurrent calls" mean?

By default, HylaFAX will schedule a job immediately if a modem is available. However, if you're sending multiple fax jobs to the same destination, the first job will be sent out immediately while the second one waits for the transmission to complete. HylaFAX does this in order to avoid calling a fax machine that is known to be busy. If you know that specific destinations have multiple fax lines, you can use a JobControl script to dynamically configure the MaxConcurrentCalls setting for those destinations (thus allowing HylaFAX to place multiple simultaneous calls to those destinations).

For details on MaxConcurrentCalls, please see the *hylafax-config* manpage.

A sample JobControl script can be found here:

<http://people.ifax.com/~david/jobcontrol/jobcontrol-cid.sh>

Can I limit all fax transmissions to 9,600 bit/s (V.29)?

Yes, edit */var/spool/hylafax/etc/CONFIG/boston* and add the following parameter:

```
BTWireModulation: V29
```

Afterwards, restart the 'btgetty' processes.

Can I install VMware Tools?

Yes, on CentOS 7, simply install the 'open-vm-tools' package.

Why are we seeing "SIP 488 Not Acceptable Here" messages in our packet captures?

We've usually seen this for outbound calls when the remote side answers the call but takes longer than usual before sending fax tones. This can be caused by some sort of a device that answers the call in order to determine whether it is a fax call before transferring the call to a fax machine. Usually when there is a problem when this happens it's because the CED timeout to receive the T.38 re-INVITE has expired by the time the SIP gateway sends the T.38 re-INVITE. The SR140 will then send "SIP 488 Not Acceptable Here" and fallback to G.711 (if configured to do so) or end the call.

To extend the CED timeout, add the following parameter to */var/spool/hylafax/etc/CONFIG/boston*:

```
BTCEDTimeout: 30
```

Afterwards, restart the *btgetty* processes.

When sending a fax using the Brooktrout TR1034, how many rings will the HylaFAX server wait before timing out assuming there is no carrier on the other end?

The length of time HylaFAX will wait to establish a conversation with the receiver when sending is controlled by the `ced_timeout` parameter. By default it's 40 seconds. To change that to 60, edit `ifax/bt/config/btcall.cfg` and change:

```
ced_timeout    4000
```

to

```
ced_timeout    6000
```

The value specifies the length of time, in 10 ms units, to wait for a fax answer tone (CED tone) from a remote fax machine. The maximum value is 65535 (655 seconds). Once you've saved your changes, you don't need to restart HylaFAX — changes made to this file take effect immediately.