

## Installing EGADS & SHARC on a RedHat LINUX 7.3 System

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Note: This document contains outdated and offensive “master-slave” terminology. Within UNAVCO and in our in-house materials, we have replaced this with “Access point (AP) – Station/Endpoint (STA)”, but in manufacturer documentation and configuration software, the original usage will still remain when implemented.

### As root

Add a new user called egads

Add egads user to the tty and uucp groups to give the user access to the serial ports and /var/lock directory. Otherwise, change the ownership or permissions of the serial port you want to access.

You will need to install the following perl modules in order for egads to work:

DateTime-Precise-1.05.tar.gz

MIME-Base64-2.12.tar.gz

URI-1.18.tar.gz

XML-Parser-2.29.tar.gz

The expat rpm that comes with RedHat 7.3 is newer than the one that comes with RedHat 7.1 so there is no need to install the rpm.

You can obtain the modules from:

<http://www.unavco.ucar.edu/~victoria/egads.html>

or you can obtain rpm's from rpmfind.net (redhat 7.3)

**For each module**, you will need to run the following series of commands:

```
tar -xvzf *.tar.gz
```

```
cd (directory name of module)
```

```
perl Makefile.PL
```

```
make
```

```
make test
```

```
make install
```

Obtain and install sharc.

<http://sourceforge.net/projects/sharc>

or you can get sharc using cvs:

```
cvs -d:pserver:anonymous@cvs.sharc.sourceforge.net:/cvsroot/sharc login
```

```
hit return when it asks for a password
```

```
cvs -z3 -d:pserver:anonymous@cvs.sharc.sourceforge.net:/cvsroot/sharc \
```

```
hit return
```

```
co sharc
```

```
cd into the sharc directory
```

```
./configure
```

```
make
```

```
cd into the /src directory and copy the executable to /usr/bin
```

```
chmod a+rx sharc
```

Alternatively, Obtain the rpm for sharc (redhat 7.1, 7.3):

sharc-0.99.9-1.i386.rpm  
<http://www.unavco.ucar.edu/~victoria/egads.html>

### **As EGADS user**

Obtain the egads tar file (egads-2.0a2.tar)  
<http://www.unavco.ucar.edu/~victoria/egads.html>

```
chown egads egads-2.0a2.tar  
chgrp egads egads-2.0a2.tar
```

Put the tar file in egads home directory (/home/egads) and untar. You will get a directory called EGADS and in this directory there will be 4 sub-directories (/bin, /xml, /data, /docs)

The /bin directory has the perl scripts, the /xml directory has all of the configuration files that will need to be edited, the /data directory is where the data will be stored, and the /docs directory is where the readme written by Keith Stark is located.

Edit the .bash\_profile for egads user so it looks like this:

```
# .bash_profile  
  
# Get the aliases and functions  
if [ -f ~/.bashrc ]; then  
    . ~/.bashrc  
fi  
  
# User specific environment and startup programs  
  
EGADS=/home/egads/EGADS  
EGADSCONFIG=/home/egads/EGADS/xml/Egads.xml  
PATH=$EGADS/bin:$EGADS/xml:$EGADS/data:/usr/bin:/usr/sbin:/bin:::$PATH:$HOME/bin  
BASH_ENV=$HOME/.bashrc  
  
export BASH_ENV EGADS EGADSCONFIG PATH  
unset USERNAME
```

You must log out and back in for environmental variables to take effect or source the .bash\_profile.

**Delete the egads database:**

```
cd /home/egads/EGADS/bin/  
rm EGADS
```

**Configuring egads (The changes that will need to be made are in red)**  
**The following configurations that are shown are for a direct connection to the receiver and should always be tried first (See appendix A for additional configuration options)**

Cd into the /bin directory and vi the client2.pl file (which should be linked to the egads\_client.pl file) in order to change the data path that the raw data gets written to. Also make sure the user listed is egads. The directory /home/egads/EGADS/data/raw will contain the originally named files, and the files with whatever naming scheme you choose will be placed in the /home/egads/EGADS/data directory.

```
my $configs = {
    user => "egads",
    server => "localhost",
    serverport => "43012",
    filer => "",
    filerport => "",
    datadir => "/home/egads/EGADS/data/raw/",
    fatdir => "/home/egads/EGADS/data/fats/",
    sumdir => "/home/egads/EGADS/data/sums/",
    sharc => "/usr/bin/sharc",
    debug => "100",
    hubname => ""
};
```

cd into the /home/egads/EGADS/xml directory where you will find 4 configuration files that need to be edited.

The **Clients.xml** file for a direct connection looks like the following.

```
<?xml version="1.0"?>
<!DOCTYPE Client SYSTEM "http://pasadena.wr.usgs.gov/scign/Client.dtd">
<clients>
  <client id="local-ttyS1"
    device="/dev/ttyS1"
    telem="serial"
    telem_spec="direct"
    baud="38400"
    areacode=""
    prefix=""
    waittime=""
    upload=""
    initstring=""/>
</clients>
```

The **Egads.xml** file takes care of the file naming convention and some paths need to be defined for data downloading. Filename extensions will need to be changed for archiving purposes.

```
< ?xml version="1.0"?>
<!DOCTYPE EGADS SYSTEM "http://pasadena.wr.usgs.gov/scign/EGADS.dtd">

< egads_config>

  <!-- Host to listen on -->
<config id="schedg-host" value="localhost"/>

  <!-- Port number to listen on -->
<config id="schedg-port" value="43012"/>
```

```

        <!-- Host to listen on -->
<config id="filer-host" value="localhost"/>
        <!-- Port number to listen on -->
<config id="filer-port" value="43013"/>

        <!-- Configuration file directory -->
<config id="config_dir" value="/home/egads/EGADS/xml"/>

        <!-- Sites to Manage -->
<config id="tasks" value="Tasks.xml"/>

        <!-- Master Sites List -->
<config id="mastersites" value="MasterSites.xml"/>

        <!-- Client List -->
<config id="clients" value="Clients.xml"/>

        <!-- EGADS Database Name -->
<config id="dbname" value="EGADS_DB"/>

        <!-- Raw Data Directory for original file -->
<config id="rawdir" value="/home/egads/EGADS/data/raw"/>

        <!-- Raw Data Directories for renamed files-->
<config id="datadir" value="/home/egads/EGADS/data"/>

        <!-- Change case of filenames? -->
        <!-- lower,upper,""-->
<config id="case" value="lower"/>

        <!-- FileName template do not change this -->
        <!-- If you change this, there is a bunch of -->
        <!-- code in EgadsConfig.pm that will need to-->
        <!-- be changed -->
<config id="filetemplate" value="%site%_%hub%_+G_+g_%y_%j_+s.%extension%"/>

        <!-- FileName Stuff -->
<filenames make="Ashtech" model="ALL" extension="asr"
filename="%site%_12345_%site%_+G-%w-+J.%extension%"/>
<filenames make="Ashtech" model="MicroZ" extension="asu" filename="%site%_12345_%site%_+G-%w-
+J.%extension%"/>
<filenames make="Trimble" model="ALL" extension="r00" filename="%site%%j%session%.r00"/>
<filenames make="Leica" model="ALL" extension="a1" filename="L%site%%session%%y.%j"/>

        <!-- Wait Time for clients -->
<config id="waittime" value="120"/>

        <!-- Program to fork from Filer -->
<config id="fork-bin" value="/home/user/EGADS/bin/transfer"/>
</egads_config>

```

The **MasterSites.xml** file has the corresponding site name, antenna info, receiver info, and telemetry information.

```

<?xml version="1.0"?>
<!DOCTYPE MasterSites SYSTEM "http://pasadena.wr.usgs.gov/scign/MasterSites.dtd">
<sites>
<site code="PENG" name="My Site" active="yes">
  <receiverinfo type="Ashtech" model="Z-XII3">
    <antenna number="1234" type="ASH701945B_M" dome="NONE"/>
  </receiverinfo>
</site>

```

```

    <receiver number="1234" type="ASHTECH Z-XII3"/>
    <antenna_offset north="0.0000" east="0.00" up="0.00"/>
</receiverinfo>
<comm telemetry="serial" telem_spec="direct" type="direct" baud="38400">
  <phone areacode="" number=""/>
  <freewave slave="" repeater1="" repeater2="" repeater=""/>
  <allowedtimes>
    <time start="00:00:00" stop="23:59:59"/>
  </allowedtimes>
</comm>
<sessions type="simple" seconds="24*3600" sample="15" mask="0" minsv="1"/>
</site>
</sites>

```

The line below must match up with the parameters that are defined in the Tasks.xml file:

```

<sessions type="simple" seconds="24*3600" sample="15" mask="0" minsv="1"/>
seconds = 24*3600 (daily downloads) if you want hourly it should just be (3600)
sample = 15 (15 second sample rate)
mask = 0 (elevation mask)
minsv = 1 (minimum sv's)

```

The **Tasks.xml** file is where you define what type of download you want.

There are some pre-defined options already in the file:

**daily** – download once daily, delete after 3 days

**4hour** – download every 4 hours, delete after 3 days

**hourly5** – download every hour, delete after 6 hours

**hourly1sec** – download every hour, delete after 1 hour

**hourly** – download every hour, delete after 2 days

A site can inherit these tasks by specifying the correct name in the inherit portion of the site line. The following 2 parameters are what need to be changed:

```

</site>
<site code="default" active="yes" inherit="daily"/>
<site code="PENG" active="yes" inherit="default"/>
</sites>

```

A site will be matched to a client using the telemetry/telem\_spec options in the MasterSites.xml and Clients.xml files.

Things to check for: **MasterSites.xml**

```

<comm telemetry="uscb" telem_spec="direct" type="direct" baud="38400">

```

You must set type to direct, if it is set to POTS or freewave, sharc will try to connect using a modem connection and will fail since it will never get a connect response.

To run EGADS in standalone mode:

```
cd /EGADS/bin
```

```
./client2.pl --nosoap --daemon --hub <clientname>
```

```
(ex: ./client2.pl --nosoap --daemon --hub local-ttyS1)
```

To run sharc manually:

```
sharc --port /dev/ttyS1 --baud 38400 --fatfile fat.out
```

Type 'sharc --help' for a list of command line options.

Some examples include:

--fatfile – listing of receiver file allocation table

--phonenumber – phone number for sharc to dial

--session – define receiver session

          --download – download files from receiver

## New Feature in EGADS version 2.

You can give egads a time window to download. This works well when you have another program such as lapdogs sharing the same master FreeWave in mode 6.

This configuration option is in the MasterSites.xml file:

```
<?xml version="1.0"?>
<!DOCTYPE MasterSites SYSTEM "http://pasadena.wr.usgs.gov/scign/MasterSites.dtd">
<sites>
<site code="MPUT" name="Testing 1" active="yes">
  <receiverinfo type="Ashtech" model="MicroZ">
    <antenna number="" type="" dome=""/>
    <receiver number="" type="ASHTECH UZ-12"/>
    <antenna_offset north="0.00" east="0.00" up="0.0083"/>
  </receiverinfo>
  <comm telemetry="serial" telem_spec="freewave" type="freewave" baud="38400">
    <phone areacode="" number=""/>
    <freewave slave="9107367" repeater1="" repeater2="" repeater=""/>
    <allowedtimes>
      <time start="00:00:00" stop="00:10:00"/>
      <time start="01:00:00" stop="01:10:00"/>
      <time start="02:00:00" stop="02:10:00"/>
      <time start="03:00:00" stop="03:10:00"/>
      <time start="04:00:00" stop="04:10:00"/>
      <time start="05:00:00" stop="05:10:00"/>
      <time start="06:00:00" stop="06:10:00"/>
      <time start="07:00:00" stop="07:10:00"/>
      <time start="08:00:00" stop="08:10:00"/>
      <time start="09:00:00" stop="09:10:00"/>
      <time start="10:00:00" stop="10:10:00"/>
      <time start="11:00:00" stop="11:10:00"/>
      <time start="12:00:00" stop="12:10:00"/>
      <time start="13:00:00" stop="13:10:00"/>
      <time start="14:00:00" stop="14:10:00"/>
      <time start="15:00:00" stop="15:10:00"/>
      <time start="16:00:00" stop="16:10:00"/>
      <time start="17:00:00" stop="17:10:00"/>
      <time start="18:00:00" stop="18:10:00"/>
      <time start="19:00:00" stop="19:10:00"/>
      <time start="20:00:00" stop="20:10:00"/>
      <time start="21:00:00" stop="21:10:00"/>
      <time start="22:00:00" stop="22:10:00"/>
      <time start="23:00:00" stop="23:10:00"/>
      <time start="24:00:00" stop="24:10:00"/>
    </allowedtimes>
  </comm>
  <sessions type="simple" seconds="3600" sample="30" mask="0" mins="1"/>
</site>
</sites>
```

This tells egads that it has the first 10 minutes of every hour to download since this particular configuration is doing hourly downloads.

## Appendix A

**Example configuration files for running EGADS on a FreeWave connection with the Master FreeWave in mode 6 and the 2 slaves in point to point slave mode**

### Clients.xml

```
<?xml version="1.0"?>
<!DOCTYPE Client SYSTEM "http://pasadena.wr.usgs.gov/scign/Client.dtd">
<clients>
  <client id="local-ttyS1"
    device="/dev/ttyS1"
    telem="serial"
    telem spec="freewave"
    baud="38400"
    areacode=""
    prefix=""
    waittime=""
    upload=""
    initstring=""/>
</clients>
```

### Egads.xml

```
<?xml version="1.0"?>
<!DOCTYPE EGADS SYSTEM "http://pasadena.wr.usgs.gov/scign/EGADS.dtd">

<egads_config>

bash% export EGADSCONFIG=/home/egads/EGADS/xml/Egads.xml

  <!-- Host to listen on -->
<config id="schedg-host" value="localhost"/>

  <!-- Port number to listen on -->
<config id="schedg-port" value="43012"/>

  <!-- Host to listen on -->
<config id="filer-host" value="localhost"/>

  <!-- Port number to listen on -->
<config id="filer-port" value="43013"/>

  <!-- Configuration file directory -->
<config id="config_dir" value="/home/egads/EGADS/xml"/>

  <!-- Sites to Manage -->
<config id="tasks" value="Tasks.xml"/>

  <!-- Master Sites List -->
<config id="mastersites" value="MasterSites.xml"/>

  <!-- Client List -->
<config id="clients" value="Clients.xml"/>
```



```

        <!-- EGADS Database Name -->
<config id="dbname" value="EGADS_DB"/>

        <!-- Raw Data Directory for original file -->
<config id="rawdir" value="/home/egads/EGADS/data/raw"/>

        <!-- Raw Data Directories for renamed files-->
<config id="datadir" value="/home/egads/EGADS/data"/>

        <!-- Change case of filenames? -->
        <!-- lower,upper,""-->
<config id="case" value="lower"/>

        <!-- FileName template do not change this -->
        <!-- If you change this, there is a bunch of -->
        <!-- code in EgadsConfig.pm that will need to -->
        <!-- be changed -->
<config id="filetemplate" value="%site%_%hub%_+G_+g_%y_%j_+s.%extension%"/>

        <!-- FileName Stuff -->
<filenames make="Ashtech" model="ALL" extension="asr"
filename="%site%_12345_%site%_+G-%w-+J.%extension%"/>
<filenames make="Ashtech" model="MicroZ" extension="asu"
filename="%site%_12345_%site%_+G-%w-+J.%extension%"/>
<filenames make="Trimble" model="ALL" extension="r00"
filename="%site%%j%session%.r00"/>
<filenames make="Leica" model="ALL" extension="a1"
filename="L%site%%session%%y.%j"/>

        <!-- Wait Time for clients -->
<config id="waittime" value="120"/>

        <!-- Program to fork from Filer -->
<config id="fork-bin" value="/home/user/EGADS/bin/transfer"/>

</egads_config>

```

## MasterSites.xml

```

<?xml version="1.0"?>
<!DOCTYPE MasterSites SYSTEM "http://pasadena.wr.usgs.gov/scign/MasterSites.dtd">
<sites>
<site code="OMA1" name="My Site" active="yes">
  <receiverinfo type="Ashtech" model="MicroZ">
    <antenna number="1234" type="ASH701945B_M" dome="NONE"/>
    <receiver number="1234" type="ASHTECH UZ-12"/>
    <antenna_offset north="0.0000" east="0.00" up="0.00"/>
  </receiverinfo>
  <comm telemetry="serial" telem_spec="freewave" type="freewave" baud="38400">
    <phone areacode="" number=""/>
    <freewave slave="9107254" repeater1="" repeater2="" repeater=""/>
  <allowedtimes>
    <time start="00:00:00" stop="23:59:59"/>
  </allowedtimes>

```

```

    </comm>
    <sessions type="simple" seconds="3600" sample="30" mask="0" minsv="1"/>
</site>

<site code="OMA2" name="My Site" active="yes">
  <receiverinfo type="Ashtech" model="MicroZ">
    <antenna number="4567" type="ASH701945B_M" dome="NONE"/>
    <receiver number="4567" type="ASHTECH UZ-12"/>
    <antenna_offset north="0.0000" east="0.00" up="0.00"/>
  </receiverinfo>
  <comm telemetry="serial" telem_spec="freewave" type="freewave" baud="38400">
    <phone areacode="" number=""/>
    <freewave slave="9107257" repeater1="" repeater2="" repeater=""/>
  <allowedtimes>
    <time start="00:00:00" stop="23:59:59"/>
  </allowedtimes>
  </comm>
  <sessions type="simple" seconds="3600" sample="30" mask="0" minsv="1"/>
</site>
</sites>

```

## Tasks.xml

```

</site>
<site code="default" active="yes" inherit="hourly"/>
<site code="OMA1" active="yes" inherit="default"/>
<site code="OMA2" active="yes" inherit="default"/>
</sites>

```

## client2.pl

```

my $configs = {
    user => "egads",
    server => "localhost",
    serverport => "43012",
    filer => "",
    filerport => "",
    datadir => "/home/egads/EGADS/data/raw/",
    fatdir => "/home/egads/EGADS/data/fats/",
    sumdir => "/home/egads/EGADS/data/sums/",
    sharc => "/usr/bin/sharc",
    debug => "100",
    hubname => ""
};
###

```

## Appendix B

### Example configuration files for configuring SHARC to stream BINEX data The streaming option does not work with EGADS

You must obtain the latest version of sharc and compile it in order to enable the streaming mode.

```
cvs -d:pserver:anonymous@cvs.sharc.sourceforge.net:/cvsroot/sharc login
cvs -z3 -d:pserver:anonymous@cvs.sharc.sourceforge.net:/cvsroot/sharc \
co sharc
cd sharc
./configure --enable-stream
make
```

Copy the binary executable (usually found in the /sharc/src directory) into the /usr/bin directory and change permissions so that everyone can read and execute.

You will need a config file that looks like this (usually called rt.cfg)

#### rt.cfg

```
debug 100
port /dev/ttyC0
baud 115200
stream .1,A
file rtest0%y.%j.%H.10hz,2*3600,.1
file rtest0%y.%j.%H.5hz,2*3600,.2
file rtest0%y.%j.%H.2hz,2*3600,.5
file rtest0%y.%j.%H.1hz,2*3600,1
file rtest0%y.%j.%H.5sec,14400,5
file rtest0%y.%j.%H.30sec,86400,30
```

To run sharc: `sharc --configfile <name of file>`

The data will be placed in the directory that you run sharc from and will create 10hz, 5hz, 2hz, 1hz, 5 sec files, and 30-second files, unless otherwise specified. The `--stream` switch is the actual streaming rate coming out of the receiver. The `--file` switches are the rate that is output to the various files.

You can choose to leave some of these options out of the config file.

For example if you wanted 5 sec and 30 sec data files, you could set the `--stream` option to 5 sec streaming. If you wanted 2 sec and 5 sec files, then you would need to set the `--stream` option to 1 second. For 10hz and 30 second files, 10hz would be the correct `--stream` rate. You can take out lines from the config file that you don't need.

The following is an example of having just 10 hz and 30 second files:

```
debug 100
port /dev/ttyC0
baud 115200
stream .1,A
```

file rtest0%y.%j.%H.10hZ,2\*3600,.1  
file rtest0%y.%j.30sec,86400,30

For archiving purposes, one will need to change the ending of the streamed data files so that there is an .bnx extension.

data/10Hz/coyu\_16873\_0%y.%j.%H.10hz.bnx

## Appendix C

### Example Configuration files for phone connection using EGADS

The **Clients.xml** file should be similar to the following file for phone connections using a Courier modem.

```
<?xml version="1.0"?>
<!DOCTYPE Client SYSTEM "http://pasadena.wr.usgs.gov/scign/Client.dtd">
<clients>
  <client id="local-ttyS1"
    device="/dev/ttyS1"
    telem="modem"
    telem_spec="courier"
    baud="19200"
    areacode="303"
    prefix=""
    waittime=""
    upload=""
    initstring=""/>
</clients>
```

The **Egads.xml** will be the same as the others, only the data paths and file naming convention are changed in this file.

The **MasterSites.xml** file will look like the following:

```
<?xml version="1.0"?>
<!DOCTYPE MasterSites SYSTEM "http://pasadena.wr.usgs.gov/scign/MasterSites.dtd">
<sites>
<site code="BRAZ" name="My Site" active="yes">
  <receiverinfo type="Ashtech" model="MicroZ">
    <antenna number="1234" type="ASH701945B_M" dome="NONE"/>
    <receiver number="1234" type="ASHTECH UZ-12"/>
    <antenna_offset north="0.0083" east="0.00" up="0.00"/>
  </receiverinfo>
  <comm telemetry="modem" telem_spec="courier" type="POTS" baud="19200">
    <phone areacode="303" number="1234567"/>
    <freewave slave="" repeater1="" repeater2="" repeater=""/>
    <allowedtimes>
      <time start="00:00:00" stop="23:59:59"/>
    </allowedtimes>
  </comm>
  <sessions type="simple" seconds="3600" sample="30" mask="0" minsv="1"/>
</site>
</sites>
```

The following 2 lines are the same 2 lines that need to be changed in all of the **Tasks.xml** files.

```
</site>
<site code="default" active="yes" inherit="hourly"/>
<site code="BRAZ" active="yes" inherit="default"/>
</sites>
```