Creating an AMBEserver

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dv3000d is a small program which runs on a Raspberry Pi and provides access to the NWDR DV3000 AMBE board. It makes the AMBE3000R chip on it available via the network using UDP frames. Details of the chip are beyond the scope of this document, but sufficient to say that it is capable of vocoding audio for D-Star, DMR, and P.25 Phase 2 HR and maybe more.

In order to use it a few preliminaries need to be done.

1. Prepare the DV3000 board. You need to ensure that the board is running at 230400 baud ~~and to do this, ensure that only one jumper is fitted on the board, BR2, and it is the one between pins 1 and 2. This is the one at the end nearest to the connector to the Pi.~~ (Production boards do not have jumpers and come configured for 230400.) This is the default and is optimum for operation.

2. Prepare the Raspberry Pi. This consists of (a) increasing the clock to the RPi UART, (b) disabling the getty (to allow terminal login) running on the RPi serial port, and (c) disable the console on the serial port.

    a. Edit the file **/boot/config.txt** and add the line:

    init_uart_clock=3686400

    b. Edit the file **/etc/inittab** and replace or comment the line:

    T0:23:respawn:/sbin/getty -L ttyAMA0 115200 vt100

    with:

    #T0:23:respawn:/sbin/getty -L ttyAMA0 115200 vt100

    or delete the line entirely.

    c. Edit the file /boot/cmdline.txt and replace or comment the line:

    dwc_otg.lpm_enable=0 console=ttyAMA0,115200 kgdboc=ttyAMA0,115200 console=tty1 root=/dev/mmcblk0p2 rootfstype=ext4 elevator=deadline rootwait

    with:

    dwc_otg.lpm_enable=0 console=tty1 root=/dev/mmcblk0p2 rootfstype=ext4 elevator=deadline rootwait

3. Power down the Raspberry Pi, fit the DV3000 board, and reboot

Building the Daemon from Source

Preinstall needed libraries and tools:

```
sudo apt-get update
sudo apt-get upgrade
sudo apt-get install libusb-1.0-0-dev libwxgtk2.8-dev portaudio19-dev git-core \
build-essential g++ python-serial
```

(You can remove the \ and type all on one line)

Install and build the wiringPi library from source:

```
cd
git clone git://git.drogon.net/wiringPi
cd wiringPi
./build
```

Obtain the current source for AMBE Tools at
https://groups.yahoo.com/neo/groups/ircDDBGateway/files/Beta/

Unzip the files in your home directory, then

```
cd
cd AMBETools/DV3000

python AMBEtest2.py
```

The results should include:

Product ID
6100010030
Wrote: 5 bytes
a
0**AMBE3000R**
Version
6100010031
Wrote: 5 bytes
a**11V120.E100.XXXX.C106.G514.R009.B0010411.C0020208**

The dv3000d program then needs to be built and run on the Pi. Take the files from this directory and copy them to somewhere suitable on the Pi, once there, and assuming that you have a set of compilers on your Pi, type in the following command:

```
make
```

This should build a new file named dv3000d. This can be copied somewhere more convenient.

To run the program you need to use the command:

```
sudo ./dv3000d
```

which will run the program in the current window or terminal. However if you want it to run in the background use the command:

```
sudo ./dv3000d -d
```

By default dv3000d uses UDP port 2460 for communicating with programs that need

its services, if this isn't convenient then it can be changed with the -p option. This can be seen in copies of the above commands, using port 24600 now, below:

sudo ./dv3000d -p 24600
sudo ./dv3000d -p 24600 -d

That is all there is to running the dv3000d program. By itself it does very little but allows other programs to access the DV3000 on your Pi from anywhere on your network, or even the Internet.

Available Applications

AMBEtools – build the from source downloaded earlier:

```
cd
cd AMBEtools
cp settings_raspbian_armhf.mk settings.mk  # Choose proper .mk for your OS
make clean
make
sudo make install
```

You will need to run a desktop for dvtoolreader and dvtoolwriter

Or install from 'exe' file on a Windows PC.

DummyRepeater – source and executables available at
https://groups.yahoo.com/neo/groups/pcrepeatercontroller/files/Release/
Configure to point to the dv3000d, your soundcard, and your ircDDBGateway instance.

DummyRepeater requires installation and configuration of **ircDDBGateway** available at https://groups.yahoo.com/neo/groups/ircDDBGateway/files/Beta/ On a standalone install use a test or quadnet server.

If you want to create your own applications, use these applications as examples. You can find the various control strings and responses for the AMBE-3000™ at http://www.dvsinc.com/manuals/AMBE-3000_manual.pdf