

Getting your DVAP on the air with the Raspberry PI

Mark Simon – WD9JEN December 24th, 2012

Here is a quick start guide to getting the raspberry pi operating as a stand-alone gateway with the DVAP.

Introduction:

If you purchased the raspberry pi as a kit, it came with a SD card with Debian Linux on it. You don't need to use this for setting up the DVAP. But, you will need it for other raspberry pi fun.

You will need a SD card, 4 gig or 8 gig, that is blank and formatted in FAT32. While you can use 4 gig card, using an 8 gig card will give you room to grow. Additionally, the cost differential between the 4 and 8 gig SD cards is minimal. The speed of the card will load the programs faster, thus decreasing the time to get to a ready state. Otherwise, we have not seen any operating or performance issues with the various speed cards.

Consult the web site: http://elinux.org/RPi_VerifiedPeripherals for SD cards known to work with your PI as well as other peripherals.

There are two Yahoo groups that you can join to keep up to date on using the Raspberry PI with DSTAR as well as other capabilities.

<http://groups.yahoo.com/group/ircDDBGateway/>
<http://groups.yahoo.com/group/pcrepeatercontroller/>

The link to the software package is:

<http://www.westerndstar.co.uk/Downloads/DVAP+ircDDB+VNC.rar>

If the build is not available take a look at the yahoo groups. It's possible that the link may go away, change or get updated.

The image includes the Debian operating system, the DVAPNODE software, IRCDDDB software, WIFI utility, and VNC (remote access server). It's everything you need. But it's not exactly plug 'n play.

This is a generic image. Not set up for anyone specific. You just need to do some edits and it's ready to go. Special thanks to Brian GW6WTK for making this build assessable as an image and a real time saver.

The build is a RAR compressed file. If you don't have a RAR de-compressing

program you can find one using Google. “WinRAR” is one of the options for windows. The downloaded image download is about 600K. It will de-compress to about 3.8 gig.

The easiest way to put the build image on the SD is to use windows although there are methods for OSX and Linux. Good luck with that. I used windows XP running on an Apple Mac under VMware Fusion. I used an external USB memory card reader.

Caution: You have to put the file on the SD card as an image. You can't drag 'n drop the files onto the card. Just follow the instructions, rather than using your intuition. Don't be alarmed if you check the properties of the SD card volume after the image is written and find it's showing only 60 meg worth of files. It's all there. Windows just does not know how to read it.

Initially I had issues with my USB/SD card reader. If your computer does not recognize the SD card it may be an older reader that can't read cards greater than 2 gig. You may need to get a newer one. This will either work or not work. If you can see the full 4 gig or 8 gig as a single drive when you connect the card you are good. If you see several “drives” each 2 gig, you need a newer card reader.

For Windows the image writer software recommended is:
win32diskimager-binary.zip at:
<https://launchpad.net/win32-image-writer/+download>

Use the image that says it has a bug. Version 0.6. You may see an error pop up when running this version. As of this writing, it's the most recent version and it works. Keep the image writer handy, as you will use this to put images on the SD and to save them to your windows drive if you want to archive your own SD image. It's always good to have a backup although you can re-build if necessary.

Now your ready to go. Here are the steps.

1. Obtain the DVAP/PI image, the image writer, and the de-compression software.
2. Un-“rar” and save the image in a convenient location.
3. Connect the SD card using a card reader. Make sure that the card can be read and does not have anything you want to save on it. It will be re-formatted and erased upon saving the image. The SD card will likely be the E: drive however it may be different depending on you computer configuration.

4. Using the win32diskimager pick the E: "drive" and the DVAP+ircDDB+VNC.img file. SAVE the image to the drive. May take 15 to 30 minutes. Note: The program will be calling this "SAVE" rather than copy or burn.
5. After the card is done, properly eject it. Put it in the PI. Connect the WIFI dongle, HDMI to the TV, DVAP, Keyboard and Mouse/trackpad. You can use wired ethernet if you want instead of WIFI. You can use a passive USB hub. It is best to run the DVAP on the raspberry pi's USB port directly to assure that it has adequate power. While you can use a non-powered HUB you may find your mouse/trackpad hard to control. If so use a powered hub.
6. Connect the power to the pi and plug it in to the AC outlet. You should see text on the screen as Linux boots up. Then you should see the graphical interface screen with the DVAPNODE and IRCDDDB software running.
7. On the desktop open the WIFI program. Find your WIFI SSID and set it up. Skip if using Ethernet.
8. Follow the screen shots in this document. These screens show the specifics. Just replace WD9JEN with your call.
9. That's it. See you on the air.

Here are the screen shots. Tab by Tab for DVAPNODE and ircDDB Gateway. Under each program you will see these settings under the "preferences" tab. The tabs not shown are not set up for using DPLUS with the DVAP use. Change my call, WD9JEN with yours. Change the DVAP frequency, Node letter, beacon time and language to meet your needs.

While other capabilities beyond DPLUS are possible, those roads are yet to be explored. Perhaps another chapter.

DVAP Node Preferences

Callsign Network Timers Beacon DVAP

Callsign C

Gateway G

Mode

Ack

Restrict

RPT1 Validation

DVAP Node Preferences

Callsign Network Timers Beacon DVAP

Gateway Address

Gateway Port

Local Address

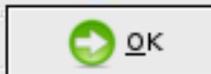
Local Port

DVAP Node Preferences

Callsign Network **Timers** Beacon DVAP

Timeout (secs) 180

AckTime (ms) 500

Detailed description: This is a screenshot of the 'Timers' tab in the DVAP Node Preferences window. The window title is 'DVAP Node Preferences'. The 'Timers' tab is selected, showing two settings: 'Timeout (secs)' set to 180 and 'AckTime (ms)' set to 500. Each setting is accompanied by a horizontal slider bar. At the bottom of the window, there are two buttons: 'Cancel' with a red 'X' icon and 'OK' with a green arrow icon.

DVAP Node Preferences

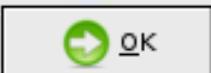
Callsign Network Timers **Beacon** DVAP

Time (mins) 30

Message WD9JEN

Voice Enabled

Language English (US)

Detailed description: This is a screenshot of the 'Beacon' tab in the DVAP Node Preferences window. The window title is 'DVAP Node Preferences'. The 'Beacon' tab is selected, showing four settings: 'Time (mins)' set to 30 with a slider bar; 'Message' set to 'WD9JEN' in a text input field; 'Voice' set to 'Enabled' in a dropdown menu; and 'Language' set to 'English (US)' in a dropdown menu. At the bottom of the window, there are two buttons: 'Cancel' with a red 'X' icon and 'OK' with a green arrow icon.

DVAP Node Preferences

Callsign | Network | Timers | Beacon | DVAP

Port: /dev/ttyUSB0

Band: 2m

Frequency (Hz): 144970000

Power (dBm): 0

Squelch (dBm): -100

Offset (Hz): 0

Cancel OK

ircDDB Gateway Preferences

Gateway | Repeater 1 | Repeater 1 | Repeater 2

Callsign: WD9JEN G

Gateway Address:

Local Icom Address: 127.0.0.1

Local Icom Port: 20000

Local HB Address: 127.0.0.1

Local HB Port: 20010

Latitude: 0.000000

Longitude: 0.000000

QTH: Arlington Heights
IL, USA

URL:

Cancel OK

ircDDB Gateway Preferences

Gateway Repeater 1 Repeater 1 Repeater 2

Band C

Type Homebrew

Address 127.0.0.1

Port 20011

Bands 0 0 0

Reflector None A

Startup Yes

Reconnect Never

Cancel OK

ircDDB Gateway Preferences

Gateway Repeater 1 Repeater 1 Repeater 2

Frequency (MHz) 0.0000

Offset (MHz) 0.0000

Range (kms) 10

Latitude 0.000000

Longitude 0.000000

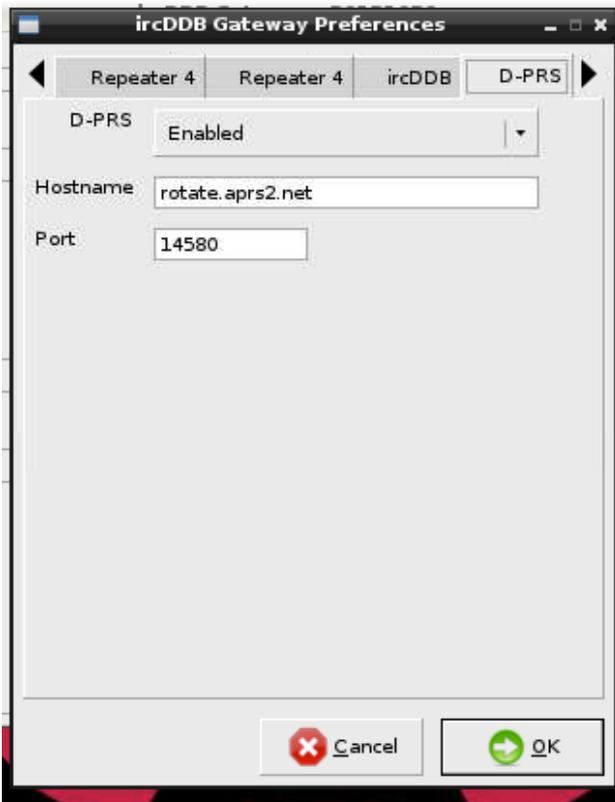
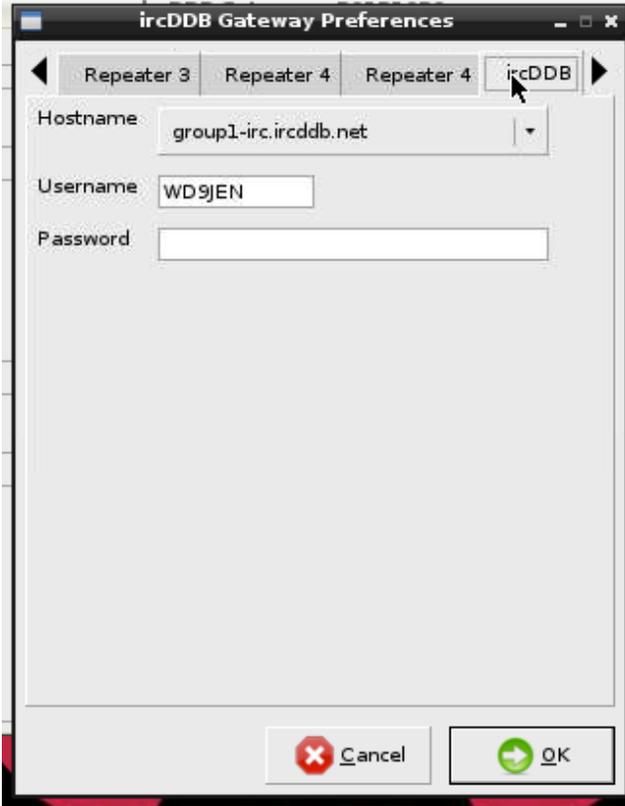
AGL (m) 10

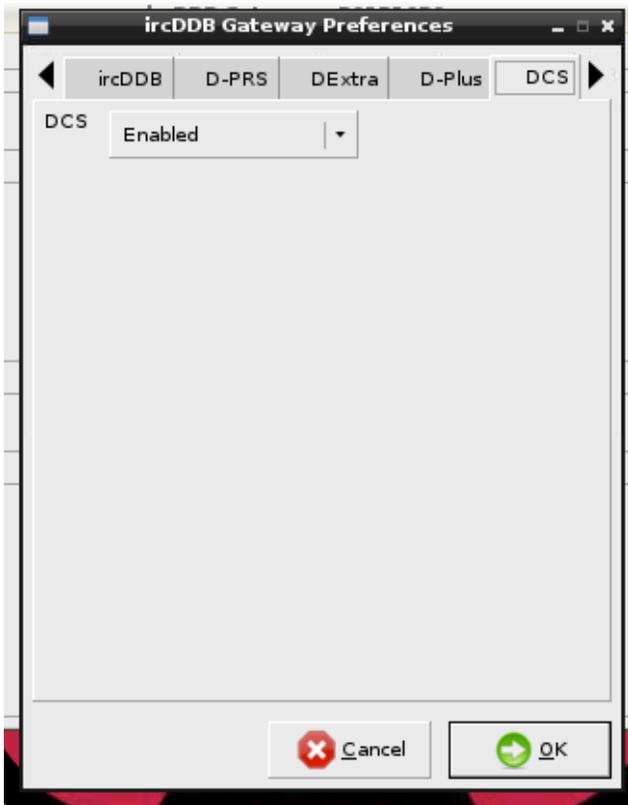
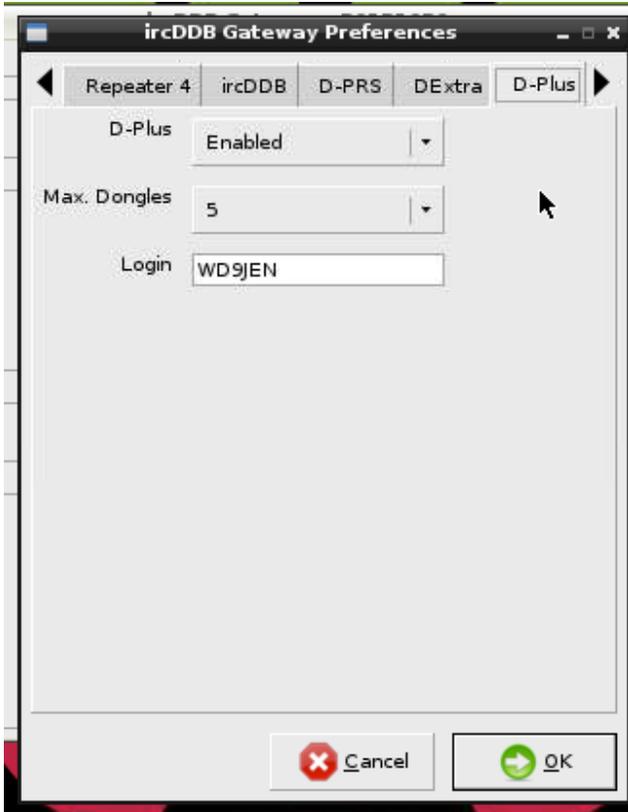
QTH Arlington Heights

IL, USA

URL

Cancel OK





A few items of note:

Pick the language of choice for the announcements. These will be different from the ones that you would have using the DVAP software for your PC, Mac or Linux.

The write protect switch is not recognized by the PI. So, back up your build using the Win32imagewriter.

With the price of the SD cards as they are, I have separate builds for each Wi-Fi situation that I typically use. Example, one for Wi-Fi at home and one for my iPhone hot spot. I just plug in the appropriate SD card. This way I don't need to use a keyboard and monitor or VNC. I also have separate cards for my other projects.

The TightVNC server starts automatically on the PI. There is a client application on the TightVNC web site for windows. On a Mac I use the java version. I use Mocha VNC on the iPad and iPhone. For the windows version, use the IP address with port 1. i.e. 192.168.1.123:1, server port 5900. For the java, iPad and iPhone versions use just the IP address and server port 5901. You may need to experiment with these settings using other VNC programs.

The TightVNC connects to an alternate desktop rather than the one that you will see with a TV connected. But you can run the Wi-Fi configuration from this screen.

If you have trouble connecting to your hotspot make sure that the SSID name does not have any special characters. Example from K9RUF. "Dave's iPhone" needed to be changed to "daves_iphone". It doesn't like the apostrophe. Spaces seem to be ok, but I prefer to use underscores.

So how do you use it? Set up your radio the same way you did when using the DVAP with your computer. You do all connection control with your radio.

Example to LINK to: KC9XYZ put your radio on the same frequency as the DVAP. With your call being WD9XYZ

URcall: KC9XYZBL
RPTR1: DIRECT
RPTR2: DIRECT
MYCALL: WD9XYZ

Change to:

URcall: CQCQCQ
RPTR1: WD9XYZ C
RPTR2: WD9XYZ G
MyCall: WD9XYZ

I keep these in separate memories in my radio. Do what works for you.

During operation, once configured, you can run without the HDMI, Keyboard mouse/track pad from the pi. You just need the PI, DVAP, WIFI or Ethernet. Plug it into power. You will hear the DVAP tell you when it's ready on your radio. When you want to shut it down, unplug it. I have successfully pulled power on the PI and plugged it back in without trashing the build. I'm not sure that my luck will go on indefinitely.

When the DVAP is connected you will hear "linked to...". When it is trying to connect, you will hear "linking to....". If it keeps on "linking" either the link is failing or you don't have an Internet connection. You will also see this on the radio display.

The default user/pass for the Debian build is:

User Logon: pi

Password: raspberry

Working with Dave, K9RUF, we had this all working in fairly short order. In fact it took me way longer create this write up than it did to get on the air. Once understood, it's under an hour to go from a blank card to "done".

You can find Mark at: wd9jen@aol.com

Dave at david@holmgren.tv

We both hang out at on DSTAR node KC9OKW in Near Chicago IL.
Hope to hear you on the air.
