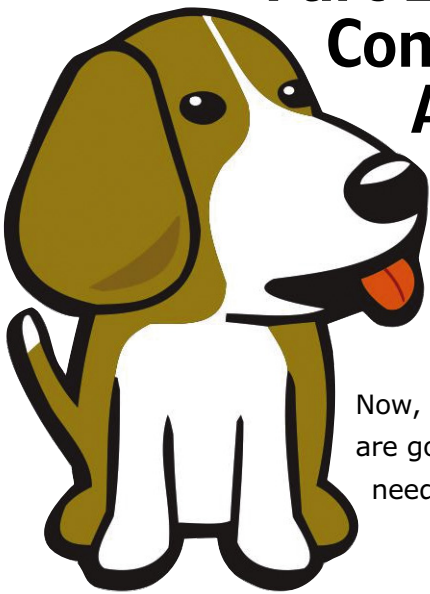# BeagleBone Black, The Sequel (2)

Part 2: BBB Virtual Network Computing and Remote Access

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Back in Elektor.POST, Project Edition # 25 we introduced the BeagleBone Black (BBB) and looked at its specification and I/O ports. Now, before we do any more with the I/O ports we are going to show how to run our BBB without the need for an extra monitor, keyboard or mouse.

Actually, we are going to connect with the ether and using VNC, remotely access our BBB (it's not magic—just electronic smoke and mirrors).

Virtual Network Computing

We'll start with the techy bit and have a quick explanation of what VNC is all about. VNC is a graphical desktop sharing system where it is possible to remotely control another computer. Besides sharing and updating screen graphics, keyboard and mouse events are transmitted from one computer to another [1].

The important element with VNC is platform-independency. We can use a VNC viewer on one computer with, say, a Windows operating system and can connect to a VNC server on another computer running the same or a different operating system. This portability allows us to run a VNC server on our BBB and access the doghouse remotely from another Windows, Linux or Macintosh computer with a VNC viewer client.

For this "BBB" .Post we are going to install a VNC server, x11vnc on our BBB, and on our PC install Putty for a remote console and TightVNC as a VNC viewer.

PC software: Remote Access

Before we install any software on our BBB [2] we'll need to install Putty and TightVNC on our PC. Both software packages are available for Windows and Linux. For our example we'll be installing them on a Windows PC.

We'll first download and install Putty (officially: PuTTY) [3] which will allow us to access our BBB remotely using a secure shell (SSH). Putty (not Silly Putty, [4]) will allow us to remotely log into our BBB and execute commands. It uses using public-private key encryption so we'll be safe as (dogs) houses.

Once this is installed we'll download and install our VNC viewer, TightVNC [5]. As with Putty, download the installation file and follow the prompts when it is run.

BBB: VNC Software

We'll start by connecting our BBB to our PC's USB port and also to the network. On our PC the BBB should now appear as a USB drive. Find and install the BBB drivers needed for our PC (Windows or Linux). It's possible you may get a warning message, **Figure 1**, if so press the Install option and continue.

Once installed, we'll start Putty and enter the IP address 192.168.7.2 (which is the default IP address for the BBB). Soon, we'll be presented with a log in screen, see **Figure 2**. We'll log in as **root** for the user and press the return key when asked for a password (there is no password at this stage).
Once we've done this we should see the BBB command line. On the command line type the following:
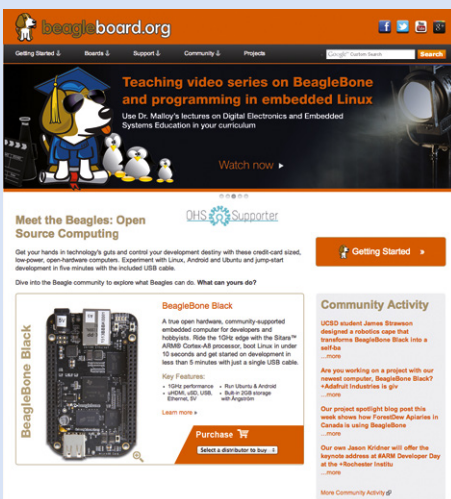
```
opkg update
```

This will update our BBB with the latest software files and patches. Once finished, we can install our VNC server. On the command line type (**Figure 3**):

```
opkg install x11vnc
```

Once the VNC server has downloaded and installed itself on our BBB we are ready to start our first remote session. Type the rather archaic command (or better still just copy and paste it into Putty):

Figure 1. Warning message.
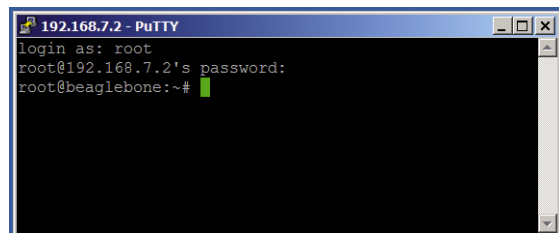
Figure 2. Putty & BBB login.

Figure 3. Installing x11vnc on the BBB.

Internet Links

[1] VNC on Wikipedia:
http://en.wikipedia.org/wiki/Vnc

[2] Beagle Website:
http://beagleboard.org

[3] PuTTY:
www.chiark.greenend.org.
uk/~sgtatham/putty/

[4] Silly Putty:
http://youtu.be/GxdfoJoWNE4

[5] TightVNC:
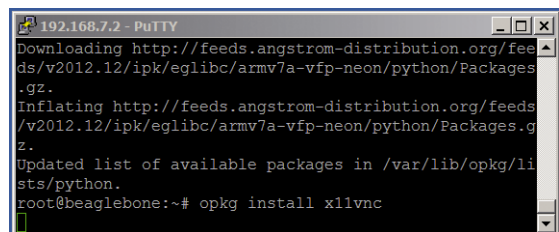www.tightvnc.com

```
x11vnc -bg -o %HOME/.x11vnc.log.%VNCDISPLAY -auth /var/run/gdm/auth-for-gdm*/database -display :0
```

This will start the VNC server on our BBB. On our PC we can start TightVNC icon and again using BBB's default IP address of 192.168.7.2 we can start a remote session—see **Figure 4**.

If all has worked we should see BBB's remote desktop—**Figure 5**. We can now access the BBB and its programs remotely from our PC. Doggie daycare! Bark Bark!
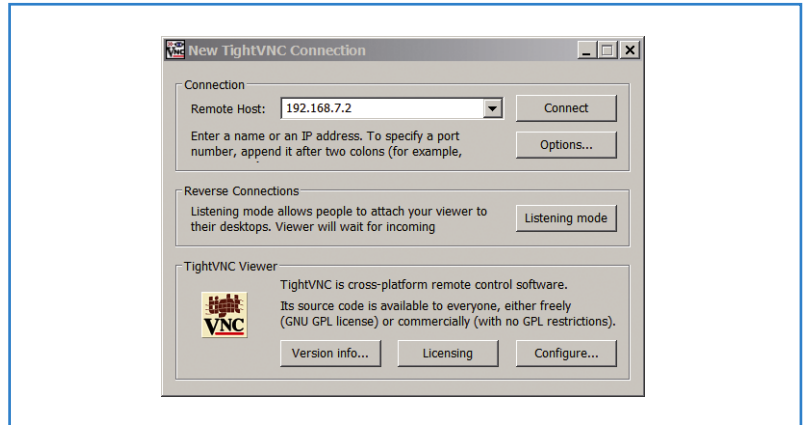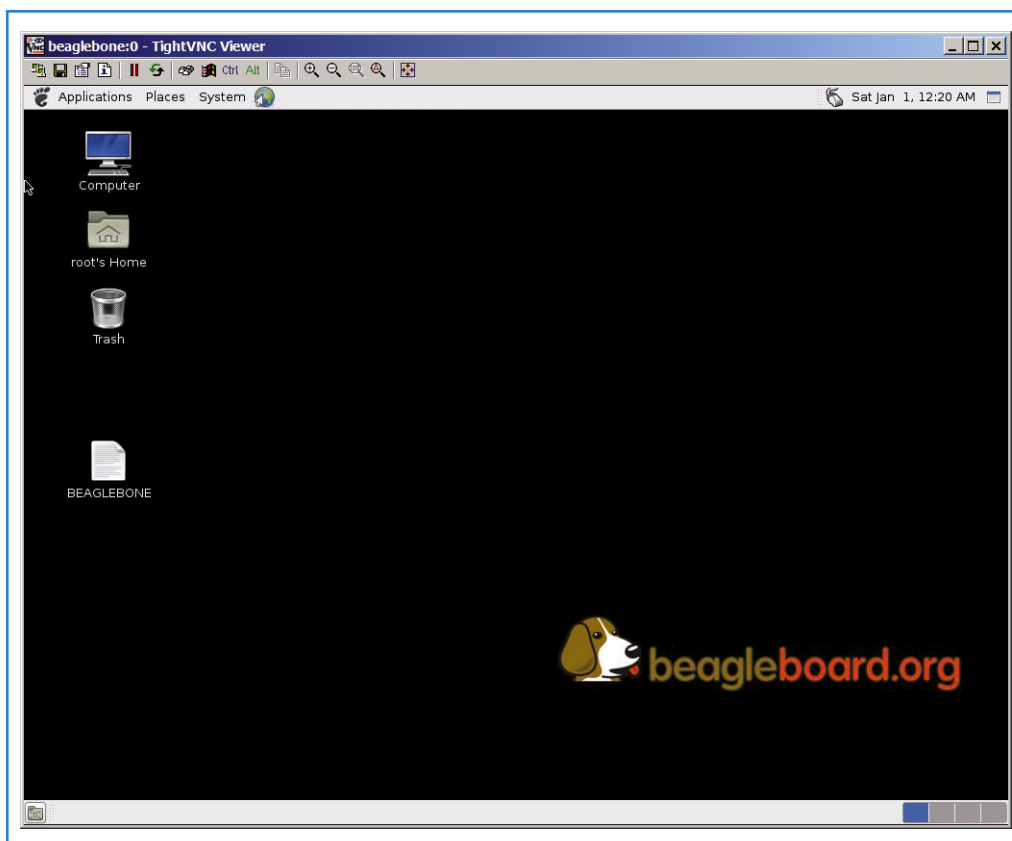
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Figure 4. Starting Tightvnc on the PC.

Figure 5. The BBB Remote Desktop. Beware of the Dog!