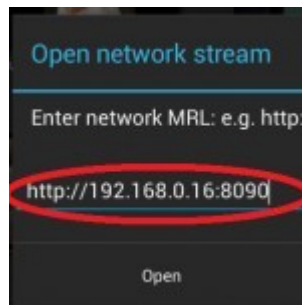# How to stream video from your RasPiCam to your Nexus 7 tablet using VLC

Yesterday I went to the Cambridge Jam. It was a very good Jam. I met four members of the Raspberry Pi Foundation and they were all extremely nice people.

I took three demos with me:

1. Gertboard "Whackadoodle" Wii controller
2. Wii controller nunchuk Guzunty car
3. RasPiCamCorder

I had the RasPiCamcorder streaming live video to my PC via my phone as WiFi router. It worked quite well, but with poor latency. It took several seconds for changes to appear on the screen. I hadn't had time to monkey about with the commands and was streaming 1080p at 30fps. So it was really slow.

I want to stream to my Nexus

I was musing out loud with Andrew Scheller about how nice it would be to be able to stream to my Nexus 7 tablet. He mentioned something about VLC, which I'd already installed on there but not done much with.

Streaming video is a bit of a new thing for me. It seems like a bit of a black art.

So I had a poke around on the Raspberry Pi Forums last night. There, I found out that if you install VLC on the Pi, you can stream video from the Pi and then view that stream using another device to access it. I'm also using VLC on the client device, but I imagine any program that can view an .h264 stream would work.

Lower frame rate and lower resolution was the key

I managed to get it working this morning, having read the camera software manual and discovered how to change the frame rate and picture dimensions. The Nexus couldn't cope with a 1080p 30 fps stream. I tried 720p 30fps and 25 fps, but no dice there either. 720p (1280 x 720) nearly works, but the picture breaks up.

The Nexus copes perfectly with 640 x 360 @ 25 fps and 800 x 450 @ 25fps works well if not too far from the router. 900 x 506 seems about as much as it can cope with. Oddly enough, I think this is a limitation of the Nexus, not the Pi. The Pi can wirelessly stream to my ethernet connected laptop at higher res (720p @25fps) with no breakup.

OK. so how do you actually do it?

You need to install VLC on both devices. To install VLC on the pi…

```
sudo apt-get update
sudo apt-get install vlc
y
```

On the Nexus, or other android device, go to Google Play and install "VLC for Android Beta". Don't worry about all the Beta warnings. The world won't end and it does work OK. :)

To start streaming from the Pi

From the pi command line, type

```
raspivid -o - -t 99999 -hf -w 640 -h 360 -fps 25|cvlc -vvv
stream:///dev/stdin --sout '#standard{access=http,mux=ts,dst=:8090}'
:demux=h264
```

(you don't need the -hf horizontal flip if you are using the June 2013 or later camera driver. Also, omitting the -vvv cuts out a lot of debug messages that might make you think it's failed)

The 99999 is the length of time in milliseconds that the stream will run for (99.9 seconds). You can change that to whatever you like. (And CTRL+C to kill it at any time).

> Be aware that you will get a lot of debug output on the console screen. (Several screens worth). This is what happens when it's working. Ignore it.
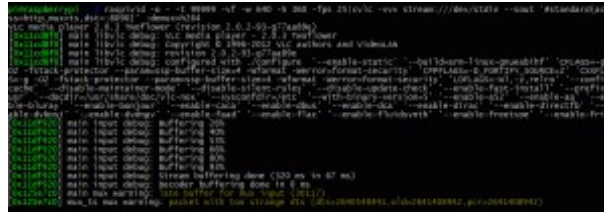
You'll get a raft of garbage debug output – ignore it.

> Also, note that when the streaming finishes at the end of the 99999 ms time period, you will have to interrupt the process with CTRL+C to get back control of your console.
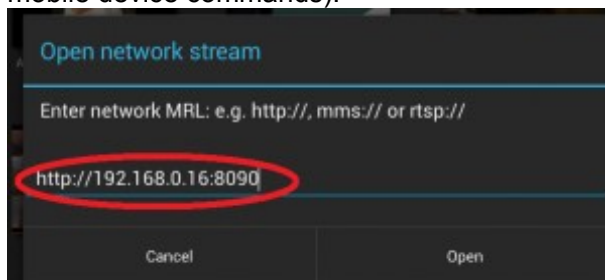
To view the stream on the Nexus

On the Nexus, start VLC and click the icon

Click the icon circled in red

and then key in the following URL and choose Open…

`http://192.168.xx.yy:8090` where 192.168.xx.yy is your Pi's ip address and 8090 is the port we told the Pi to send the stream to. (You can change that as long as it's the same for both your Pi and mobile device commands).

If you don't know the ip address of the pi, from pi console, type `ifconfig`, and you should be able to see what your ip address is. Alternatively you can use the brilliant free Android app Fing, which scans your network and tells you the ip address of everything connected to it.

Once you've done that, you should see the camera output on your Nexus' screen (as long as you didn't take more than 99.9 seconds to punch in the URL – I use copy and paste from another app to make this quick and easy).

Once it's working, you can start to change the width, height and frame rate (`-w 640 -h 360 -fps 25`) parameters to see how much your Nexus and network can cope with. Mine copes with `-w 800 -h 450 -fps 25` as long as I don't get too far away from the router.

If you're pointing the camera through a window…

…you may want to disable the red LED to get rid of its reflection. Simply add the line

`disable_camera_led=1` to your config.txt file

`sudo nano /boot/config.txt`

add the line

```
disable_camera_led=1
CTRL+o
ENTER
CTRL+X
```
Then `sudo reboot` and when the Pi comes back up, the camera LED will be disabled. You can change it back either by commenting out that line or changing the value to 0.

I hope you have fun with this and find it useful. If you try it, let us know how you got on, and what resolution settings worked best for you. It would also be interesting to hear if anyone with an ipad or iphone gets it working. I'm sure it must be possible, even if with something other than VLC on the iDevice. It also works with my Galaxy S2.