

Background: Harvard University

## VIDEO STREAMING WITH TURBOTENNA

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### Topic

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The idea of streaming video to my notebook computer has conceived for quite some time after I brought a TV receiver card for my desktop computer. The TV picture quality looks great on my desktop but I couldn't take it around the house. I tried a few PCMCIA TV receivers on my notebook computer and to be honest none of those comes close to my expectation. The picture looked acceptable with the in-house TV signal feed but once it returned to its small indoor TV antenna, the screen was filled with ghosts and snow.

I have subsequently made some research on ways to deliver video to my notebook until I settled on the Windows Media Encoder, which for one thing it can be conveniently downloaded from the web and on the other hand it makes use of the wireless LAN, a "home infrastructure" that I have already invested to unwire my home computing gadgets.

### The starter kit

My streaming server is equipped with an AMD ATHLON 2600+ CPU with 512MB Memory and 80GB SATA hard disk running Windows XP Professional. Other components are:

- 1) Microsoft Windows Media Encoder 9 series — you may download it here <http://www.microsoft.com/downloads/details.aspx?FamilyID=5691ba02-e496-465a-bba9-b2f1182cdf24&DisplayLang=en>;
- 2) InnoDV TV-USB2 tuner box;

- 3) Windows Media Player 10 (notebook)
- 4) Buffalo WBR2-G54S 125\*/ 54Mbps High Speed Mode wireless router with external antenna port;
- 5) Buffalo WI-CB-G54S 125\*/ 54 Mbps High Speed Mode PCMCIA wireless client adapter with external antenna port;
- 6) Dell 700m Intel Pentium M Processor 725 Notebook computer running Windows XP Professional
- 7) **TurboTenna** booster antenna and 6FT LMR-100A N-male to MC Card RF cable.

### Hardware setup

Having installed the InnoDV TV-USB2 driver to the desktop computer, you may insert the TV tuner to the USB port and connect it to the in-house TV signal source. Scan the channels to make sure that the tuner is working properly. Next, terminate the computer's Ethernet Port to the Buffalo WBR2-G54S using a RJ45 cable. Enable DHCP to obtain the IP address automatically from the Buffalo wireless router. At this point, you may write down the IP address of this Local Area Connection for later use.

Video streaming consumes a substantial amount of bandwidth and speed. Most wireless routers offer a power output of merely 15dBm (or 25mW) which has a range of 15-30 meters in open space. Unlike a cordless phone of 900MHz, the power of 2.4GHz wireless router decays rapidly when concrete walls and obstacle



### Screen at the remote wireless notebook

alike are getting in the transmission path. It is therefore necessary to boost the signal strength and quality by using a **TurboTenna** to ensure the video and voice quality.

Installing the TurboTenna for the Buffalo wireless router is easy. Simply connect the N-male of the RF cable to the TurboTenna on one end and plug in the matching RF connect to the Buffalo on the other. Point it to the spot where you intend to improve the wireless coverage.

Probably you may not need a TurboTenna for your notebook computer, but if your streaming reception area is several hundred feet away the external antenna port of the Buffalo WLI-CB-G54S PCMCIA card offers you the convenience of terminating to a TurboTenna the same way you install it to the wireless router.

#### Streaming setup

Download and installation of the Windows Media Encoder 9 are pretty straight forward. Once you have done that, click on the Encoder icon and follow the steps below:

- 1) select "Broadcast a live event";
- 2) Select video device (TV card) and click "Configure"
- 3) Select "video properties";
- 4) Select the TV encoding format. For instance, "PAL\_I" for Hong Kong's TV format;
- 5) Open a new session by selecting "Pull from the encoder";
- 6) Find a free http Port. For instance the Encoder returns a port = 1038. Write it down for later use;
- 7) Select "Multiple bit rates video (CBR)";
- 8) Continue to choose "default settings" until "Finish".

#### Putting everything together

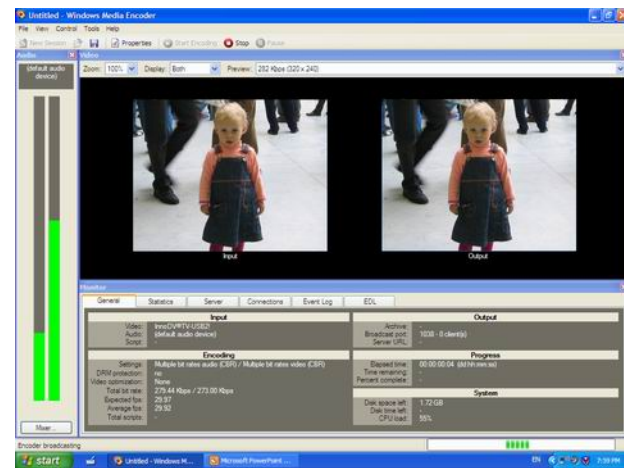
As soon as you've connected to the TV source, you may click "Start Encoding" to broadcast.

Now, let's say the IP address of the streaming server is 192.168.1.103 and the http port is 1038. Start up the Media Player 10 at the notebook computer. Open URL and key in "http://192.168.1.103:1038" then click OK. Once the buffer builds up indicating that you are receiving the wireless streaming signal from the server at IP address 192.168.1.103 and port 1038 over the air, you should be able to watch the TV on your notebook.

It just took an hour or so to set up the TV card and the video streaming server. The effort is certainly rewarding,



### Streaming at video server



not only do I learn the magic of wireless streaming, I can also carry my notebook around my house and be able to watch TV or a DVD movie just simply switching the video source at the Windows Media Encoder.

Better still, I've got the home wireless networking signal strength and quality improved with the TurboTenna.

Have a question? Please send email to [jkong@danets.com](mailto:jkong@danets.com) 