Application Note:

Streaming Video to a PC with Low Delay

Abstract

The system and settings described in this App Note allow you to create a low delay audio/video link from a QVENC or QVPRO encoder to a PC. Using these settings. we were able to measure about 300 ms delay from an HD-SDI input of a QVENC encoder to the output displayed in a window of a PC running Microsoft Windows XP. The same software should also work on a PC running Windows 7 or Windows 8.

Overview

You will need QVENC connected from a video source to an Ethernet switch, and a PC running Microsoft Windows connected to that same Ethernet switch. This App Note describes the system setup and measures the delay over a private Local Area Network (LAN). A small tablet PC, such as the Microsoft Surface or an Ultra book should work well for the receiving device.

Applications involving transmission over the Internet would add Internet network delays, packet jitter, and packet loss. You would need to enable ARQ error correction to address these issues, which add additional buffering delays,

Getting and Installing the Decoder/Display Software for the PC

We are currently recommending using the Elecard NW Player Application from the Elecard Codec .NET SDK G4 software development kit, which can play a video over IP stream on a PC running Microsoft Windows. You can download a demo version of this software from:

http://www.elecard.com/assets/files/distribs/codec-.net-sdk/Elecard_Codec_NET_SDK_G4_Eval.zip

Once installed, you only need to run the NW Player application, which is found under the Programs/Elecard section of the Windows Start menu.

Configuration and Start-up of the Elecard NW Player Decoder Application

The following steps will start the NW Player application to listen for a multicast UDP stream from the QVENC. You can start either this application or the QVENC in any order. But for more reproducible latencies, it is best to first start the NW Player and then the QVENC afterwards, so that the first packets it will receive will be for an I-frame.

1. Start NW Player by clicking on:

All Programs/Elecard/Elecard Codec SDK G4/Bin/NW Player

2. Click **Open URL**

3. Enter a **Multicast Group** IP address, such as **225.2.22.222**

4. Under **Payload**, select **MPEG2 Transport**

5. Enter a **UDP** port, such as **10000**, that will be used for both the QVENC and this decoder.

6. The **Interface** and **Server address** fields should remain blank and the **Transport** at the default **UDP**.

At this point, the NW Player will have displayed a window saying: "Initializing Elecard Push Demultiplexor". After starting the QVENC, and after NW Player starts to receive a valid video stream, an Active Movie Window showing your video should appear. If there is too long of a delay in starting the QVENC, then NW Player may time out, requiring you to restart it.

Configuration of QVidium QVENC Encoder

For lowest delay, and to be compatible with the settings we just chose for NW Player, we suggest setting the QVENC to output a UDP stream. However, if you wish to send the stream over the Internet, then we would recommend setting the IP Transport Mode on the QVENC to ARQ, which outputs an RTP stream, and using a QVidium QVARQ-RX Proxy Server at the receiving PC to intercept the stream, process the ARQ error correction, and then forward a copy of the stream to the NW Player application. See the next section for more details about sending a stream over the Internet with ARQ to a PC.

Follow these steps to configure the QVENC:

1. Create a new profile by clicking on **Encode/Profiles** and then click **New**

2. Select the desired input source for **Video Input**

3. For SD video, enter **4000000** for the **Stream Bit Rate**, otherwise, you can retain the default 8000000 bits/second.

4. Change **IP Transport** to **UDP**

5. Select the **Advanced Encoding** tab and set the **Stream Mode** to **Low Delay**

(6. For further optimization, you can also try reducing the **DTS delay from PCR**, but too small of a value may result in jerky video.)

7. Click on **Encode/Start** to start the encoder. If you have more than a single profile, then you will have to select the profile you just created and click the **Start** button on that page.

Sending a Stream over the Internet with Error Correction

The following link will install a Windows version of the QVidium ARQ RX Proxy server that will allow you to send send the stream to a PC running Microsoft Windows (XP, 7, or 8) over the Internet using NW Player:

http://www.qvidium.com/streamviewer/StreamViewer_vlc_2_0_2.zip

In this configuration, you should configure the QVENV to send a Unicast ARQ stream to this QVARQ-RX software on the receiving PC. After processing the ARQ error correction, the QVARQ-RX can be configured to output a multicast UDP stream that can be sent to either the NW Player or VLC.