Amino Technical Note 019

Streaming Media

A guide to using VLC

October 2009

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Streaming Media –TN019

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Issue 103

The generally available software versions at the time of issue are as follows:

Platform	Software release version	CPU
103	0.15.1	IBM Vulcan
110	0.15.10	
110-H	0.15.10	
500	0.15.10	
130/130M	0.15.2	ST 71xx
130-H	0.15.2	
530	0.10.21	
125	0.12.10	TI - DM6443 or DM6441 (DaVinci)

This document describes components that undergo continual development. The information in this document is subject to change without notice at any time.

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Streaming Media – A Guide to Using VLC

This technical note describes how to setup MPEG-2 streaming over multicast to the AmiNET STB using the VLC software from http://www.videolan.org/ and provides a step by step guide to using VLC with MicroSoft Windows (XP and Vista), Mac OSX and Linux.

- VLC is a media player which can be used as a server and as a client to stream and receive network streams.
- VLS (VideoLAN Server) is able to stream MPEG-1, MPEG-2 and MPEG-4 files, DVDs, digital satellite channels, digital terrestrial television channels and live videos on the network in unicast or multicast. Most of the VLS functionality can now be found VLC.

  Note: Use of VLC instead of VLS is advised.

What is a multicast address?

multicast

1. In a network, a technique that allows data in packet form, to be simultaneously transmitted to a selected set of destinations.

Note: Some networks, such as Ethernet, support multicast by allowing a network interface to belong to one or more multicast groups.

2. To transmit identical data simultaneously to a selected set of destinations in a network, usually without obtaining acknowledgement of receipt of the transmission.

multicast address

A routing address that:

(a) is used to address simultaneously all the computers in a group, and

(b) usually identifies a group of computers that share a common protocol, as opposed to a group of computers that share a common network.

In IPv4 communications the group of multicast address runs from 224.0.0.0 to 239.255.255.255.

Locally scoped addresses

The addresses in the range 224.0.0.0 through to 224.0.0.255 are reserved by the *Internet Assigned Numbers Authority* (IANA) for network protocol usage, such as:

224.0.0.1	All Hosts
224.0.0.2	All multicast routers
224.0.0.3	All DVMRP routers

224.0.0.5	All OSPF routers
224.0.0.6	All OSPF DR

Multicasts in this range are never forwarded off the local network regardless of the Time To Live (TTL).

These multicasts are usually sent `link local` with `TTL=`1.

Globally scoped addressing

The ranges of addresses from 224.0.1.0 to 238.255.255.255 are called *Globally Scoped Addresses*. They can used to multicast data between organisations and across the internet. Amongst these addresses is the Network Time Protocol (NTP) located at 244.0.1.1. They are normally allocated dynamically throughout the internet.

Limited scope addressing

The addresses from 239.0.0.0 to 239.255.255.255 are called *Limited Scope Addresses* or *Administratively Scoped Addresses*. These are defined in RFC 2365 to be constrained to a local group or organisation. Routers are typically configured with filters to prevent multicast traffic in this address range from flowing outside of an autonomous system. Within an autonomous system the limited scope address range can be further subdivided so that local multicast boundaries can be defined.

DHCP setup for the AmiNET hardware

When an AmiNET STB is first switched on, it attempts to retrieve an IP address from a DHCP server. It is important that the DHCP scope gives out the address of a default router (even if faked, however it needs to be within the subnet) as well, this ensures correct operation of the multicast stack on the AmiNET hardware.

Static IP operation is also possible, and here again it is required to enter a default gateway.

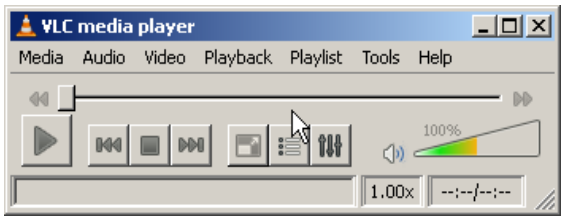
Using VLC to send a multicast stream

These instructions assume you have a MPEG2 file stored locally on your machine which you wish to send to a group of machines on the local area network.

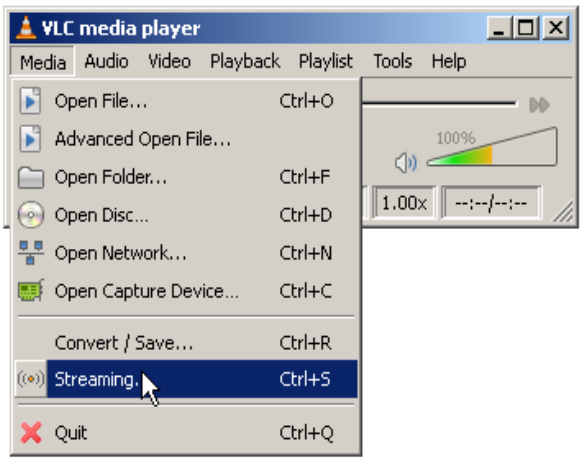
For Windows

Instructions are based on the VLC 0.9.9 software for Windows.

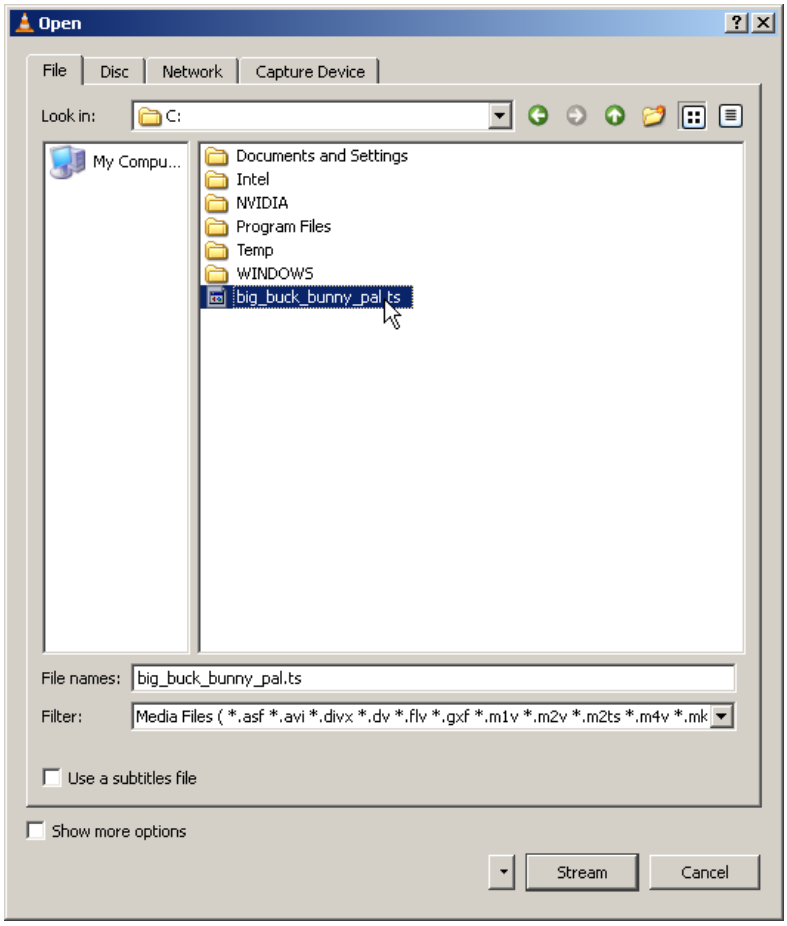
1. Launch the VLC client software



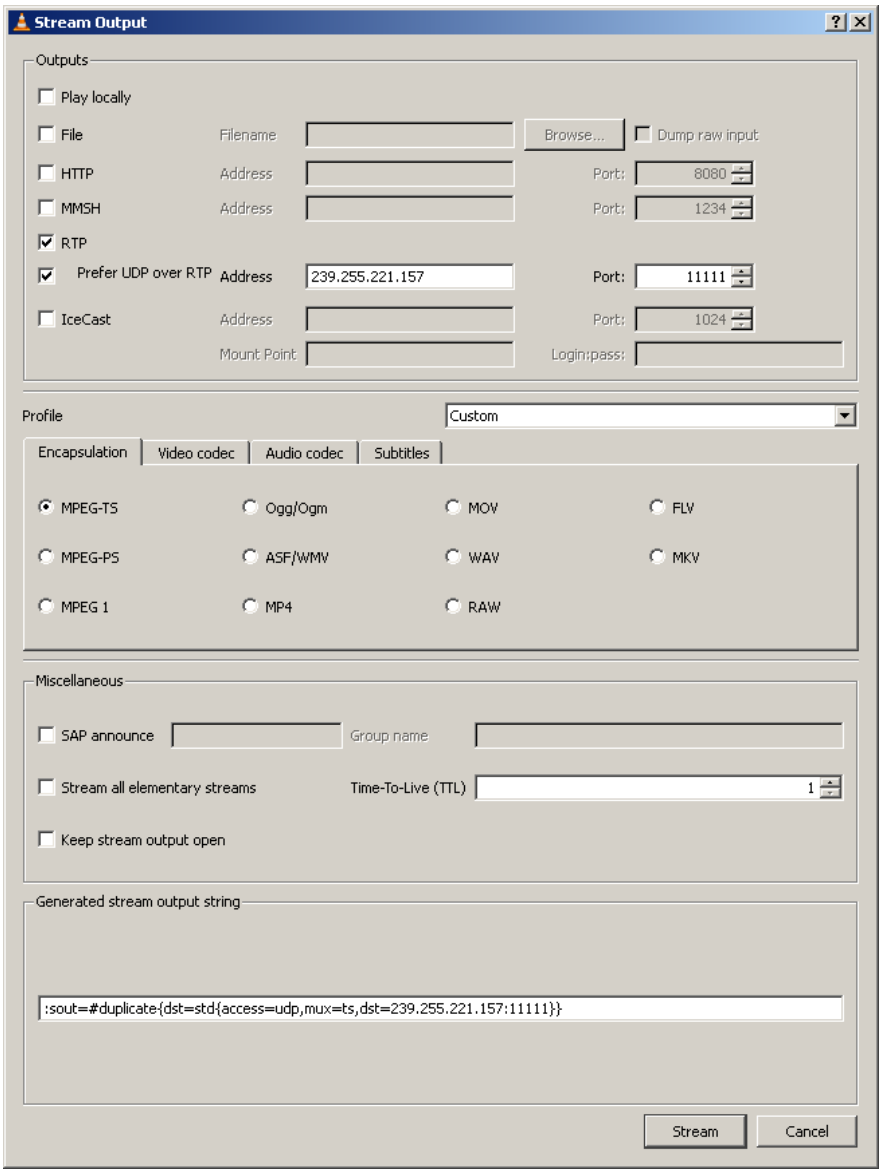
2. Select **Media** and then **Streaming**



3. In the **File** tab page, locate the file you want to stream

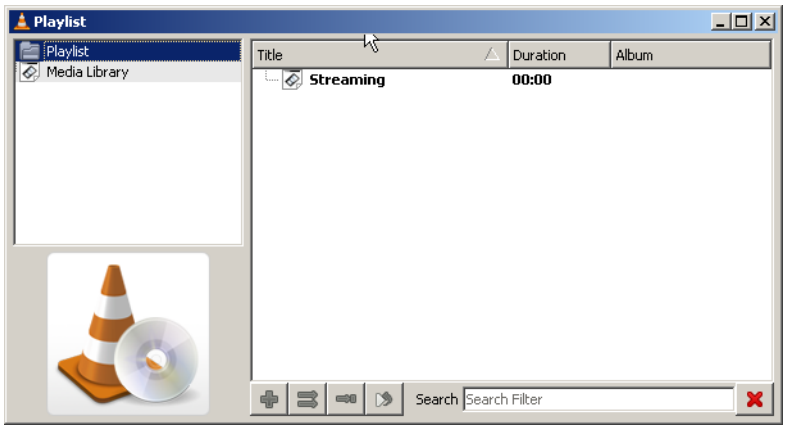


4. Click the **Stream** button



5. Click the **RTP** checkbox, and the **Prefer UDP over RTP** checkbox which is displayed beneath it.
6. Enter the multicast address you want to stream the file to in the **Address** box, for example 239.255.221.157, and then enter a port number, for example 11111 in the **Port** text box.
7. Select **MPEG TS** from the list of options in the Encapsulation tab page
8. Click the **Stream** button. The stream will now start playing
9. See Playing video on the set-top box for the next step.

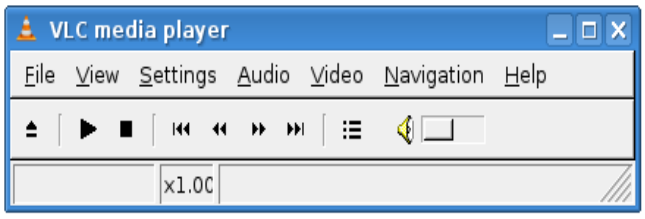
Check **Playlist** > **Show Playlists** to alter the properties of the streaming video.



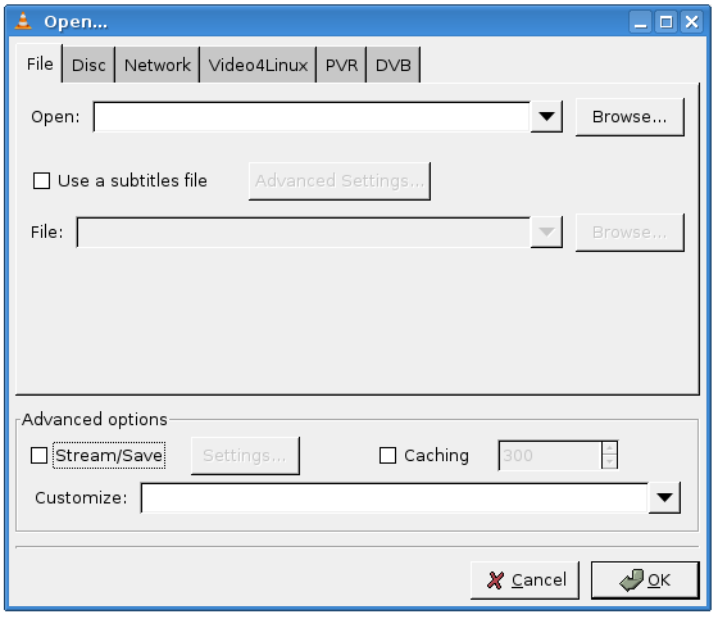
For Linux

Instructions are based on the VLC 0.8.6a software for Debian ‘etch’.

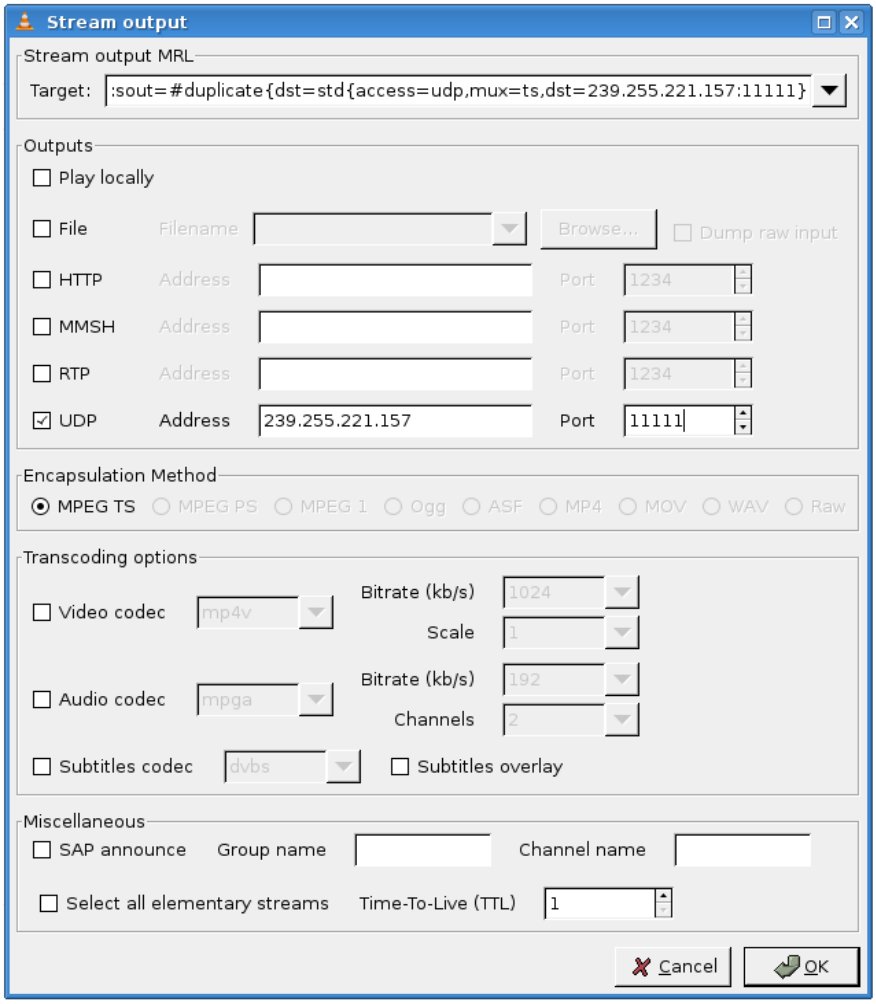
1. Launch the VLC client software.



2. Select **File** from the menu bar and click **Open File**.

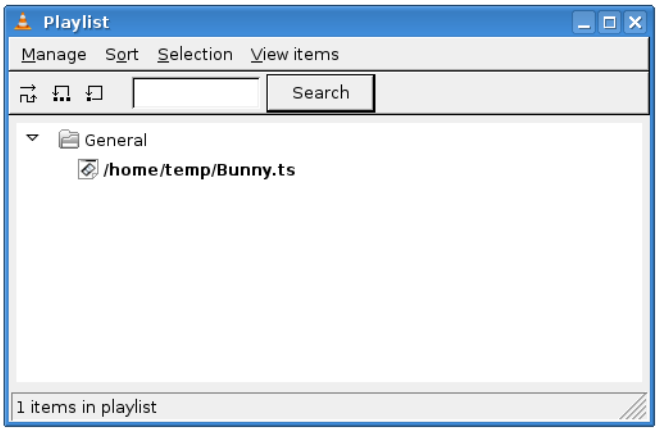


3. Browse to the file you want to stream.
4. Check the **Stream/Save** button, and then click the **Settings** button.



5. In the **Outputs** panel click the **UDP** checkbox.
6. Enter the multicast address you want to stream the file to in the **Address** box, for example 239.255.221.157, and then enter a port number, for example 11111 in the **Port** text box.
7. Select **MPEG TS** on the **Encapsulation method** panel.
8. Click **OK**, and then **OK** again on the **Open Source** window. The stream will now start playing
9. See Playing video on the set-top box for the next step.

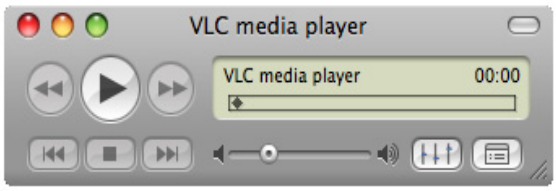
10. Select **Playlists** from the **View** drop down menu to display the properties of the streaming video.



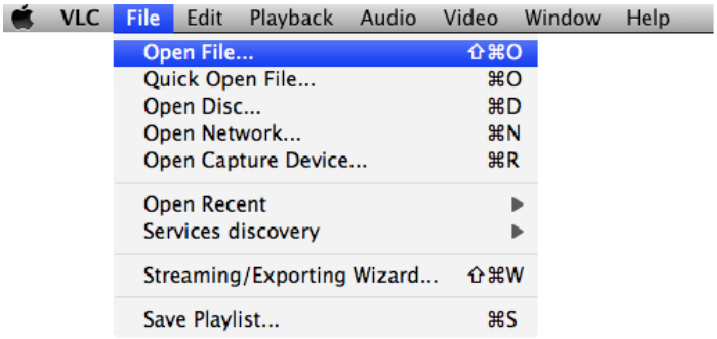
For Mac OSX

Instructions are based on the VLC 0.9.9a software for Mac OSX.

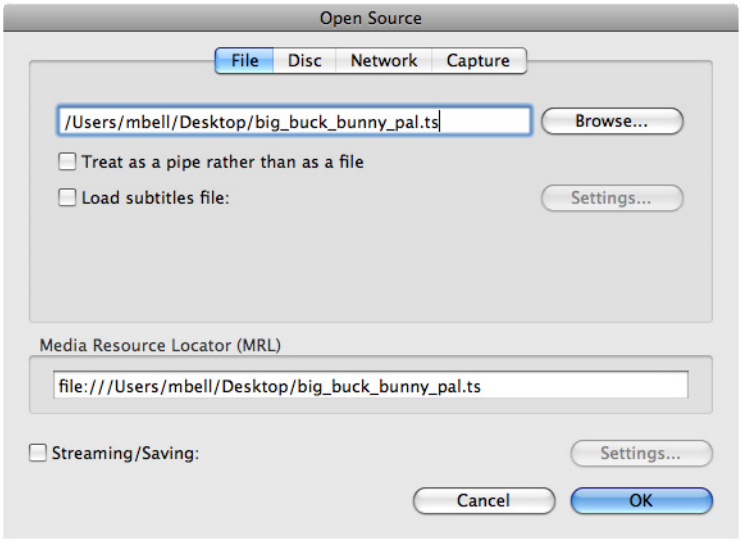
1. Launch the VLC client software.



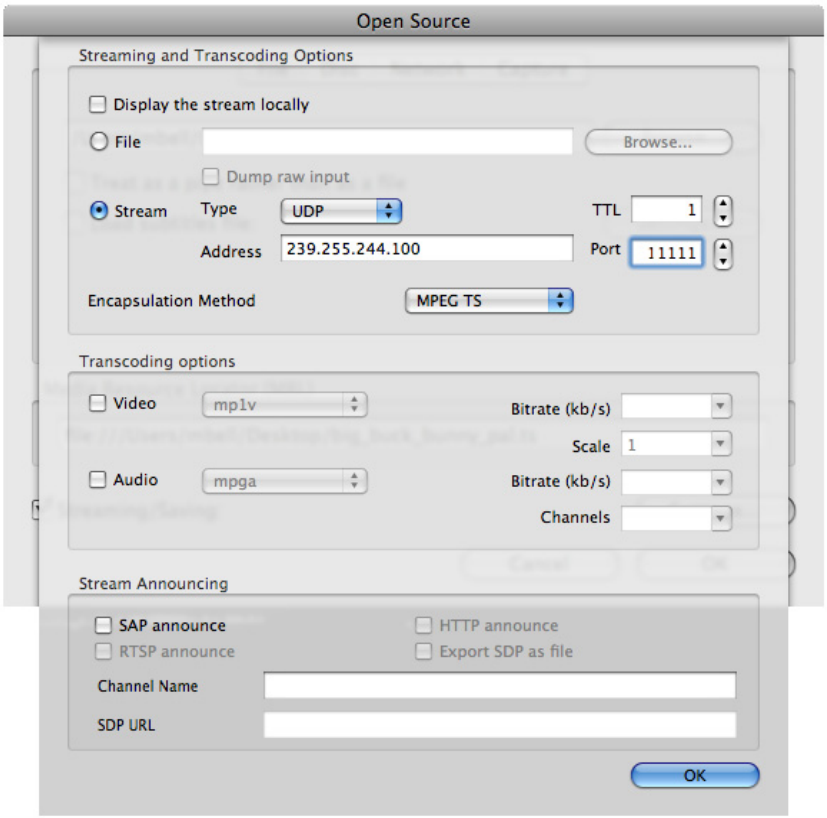
2. Select **File** from the menu bar and click **Open File**.



3. Browse to the file you want to stream.

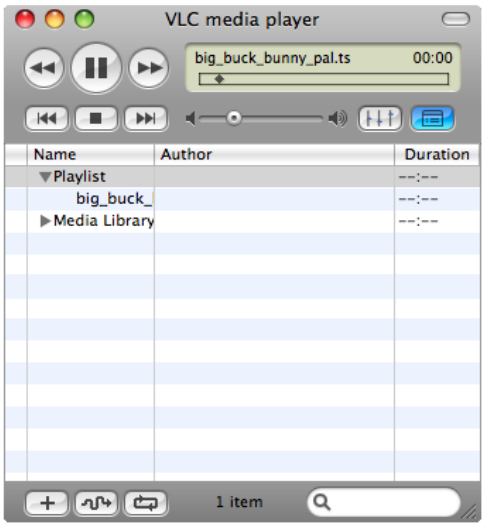


4. Check the **Streaming/Saving** button, and then click the **Settings** button.



5. Click the **Stream** radio button and select **UDP** from the pull down menu options.
6. In the Address dialogue box enter the multicast address you wish to send to, for example 239.255.221.157, and then enter a port number, for example 11111 in the **Port** text box
7. Select **MPEG TS** from the **Encapsulation method** pull down menu.
8. Click **OK**, and then **OK** again on the **Open Source** window. The stream will now start playing
9. See Playing video on the set-top box for the next step.

10. Select **Playlists** from the **Window** drop down menu to display the properties of the streaming video.



Playing video on the set-top box

In order to play the video stream on your STB you should have an IR keyboard.

1. Use the GOTO button on the keyoard to open the Address bar as shown below.

2. In the address bar of your STB enter `igmp://<address>:<port>`, where `address` and `port` are the same as the ones entered in VLC above.
3. Playback of the stream should now begin on the screen attached to the STB.

Troubleshooting

Should the STB fail to play a multicast stream, there are a number of things worth checking:

1. Ensure the STB has a default gateway.
2. Ensure that the server has default gateway and appropriate routes for multicasting.
3. Ensure that multicasting is enabled in the kernel.
4. Check to see if network switches do Layer 3 (IGMP level) filtering.
5. Ensure that the file is being produced as a single program Transport stream(a `*.ts` file).

Document history

Version	Date issued	Changes
103	October 2009	Playing the stream on an STB instructions expanded.
102	June 2009	Removed confidentiality requirement.
101	May 2009	Document created.