

VideoLAN HOWTO

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This document describes how to use the complete VideoLAN streaming solution.

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Chapter 1. Introduction

1.1. What is the VideoLAN project ?

1.1.1. Overview

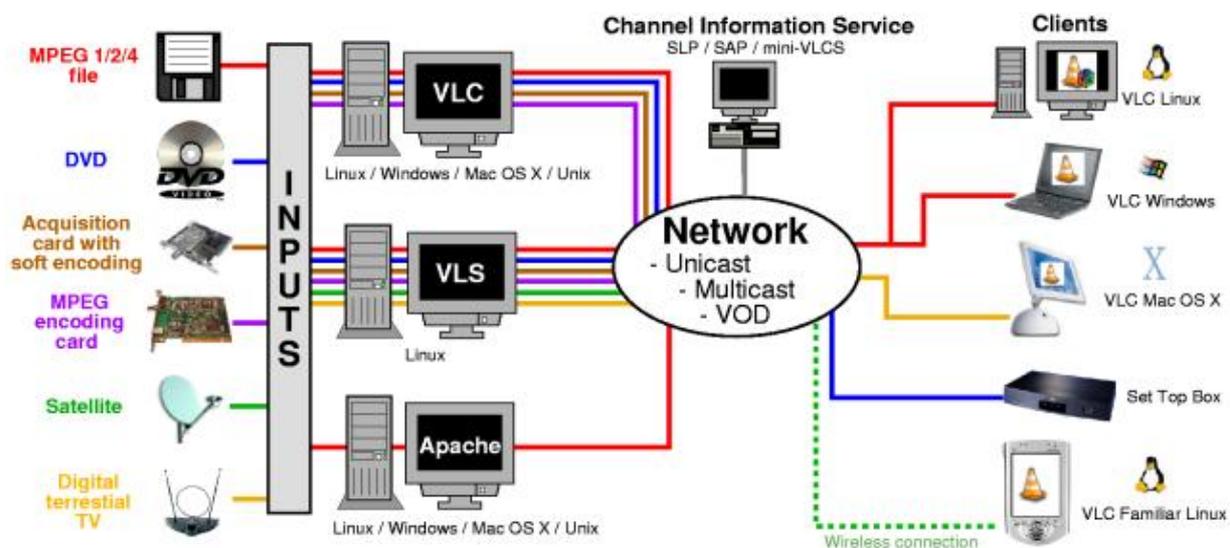
VideoLAN is a complete software solution for video streaming, developed by students of the [Ecole Centrale Paris](#) and developers from all over the world, under the [GNU General Public License](#) (GPL). VideoLAN is designed to stream MPEG videos on high bandwidth networks.

The VideoLAN solution includes :

- the VideoLAN Server (VLS), which can 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,
- the VideoLAN Client (VLC), which can be used as a server to stream MPEG-1, MPEG-2 and MPEG-4 files and DVDs on the network in unicast or multicast ; or used as a client to receive, decode and display MPEG streams under multiple operating systems.

Here is an illustration of the complete VideoLAN solution :

Figure 1-1. Global VideoLAN solution



More details about the project can be found on the [VideoLAN Web site](#).

1.1.2. VideoLAN software

1.1.2.1. VideoLAN Client

The VideoLAN Client (VLC) works on many platforms : Linux, Windows, Mac OS X, BeOS, *BSD, Solaris, Familiar Linux, Yopy/Linupy and QNX. It can read :

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- MPEG-1, MPEG-2 and MPEG-4 / DivX files from a hard disk or a CD-ROM drive,
- DVDs and VCDs,
- from a satellite card,
- MPEG-1, MPEG-2 and MPEG-4 streams from the network sent by VLS or VLC's stream output.

VLC can also be used as a server to stream :

- MPEG-1, MPEG-2 and MPEG-4 / DivX files,
- and DVDs,

to :

- one machine (i.e. to one IP address) : this is called *unicast* ;
- a dynamic group of machines that the clients can join or leave (i.e. to a multicast IP address) : this is called *multicast*.



VLC doesn't work on Mac OS 9, and will probably never do.

1.1.2.2. VideoLAN Server

The VideoLAN Server (VLS) can stream :

- an MPEG-1, MPEG-2 or MPEG-4 files stored on a hard drive or on a CD,
- a DVD located in a local DVD drive or copied on a hard disk,
- a satellite card or a digital terrestrial television card,
- an MPEG encoding card ;

to :

- one machine (i.e. to one IP address) : this is called *unicast* ;
- a dynamic group of machines that the clients can join or leave (i.e. to a multicast IP address) : this is called *multicast*.

A Pentium 100 MHz with 32 MB of memory should be enough to send one stream on the network. When streaming a lot of videos stored on a hard drive, the actual limitation is not the processor but the hard drive and the network connection.

VLS works under Linux and Mac OS X.

1.2. How can I use VideoLAN ?

1.2.1. The documentation

The user documentation of the VideoLAN project is composed of four documents :

- the [VideoLAN Quickstart](#). This document will give you a quick overview of of VLC, VLC's stream output, the Video On Demand solution and the channel information service system.
- the [VideoLAN HOWTO](#). This document is the complete guide of the VideoLAN streaming solution.
- the [VLC user guide](#). This document is the complete guide for VLC.

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- the [VLC FAQ](#). This document contains Frequently Asked Questions of VLC users.

The latest version of these documents can be found on the [documentation page](#).

1.2.2. User support

If you have problems using VideoLAN, and if you don't find the answer to your problems in the documentation, please look at the [online archive of the mailing-lists](#). There are two English-speaking mailing-lists for the users :

- vlc@videolan.org for the questions on VLC,
- streaming@videolan.org for the questions on VLS, mini-SAP-server and the network.

If you want to subscribe or unsubscribe to the mailing-lists, please go to the [mailing-list page](#).

You can also talk with VideoLAN users and developers on IRC : server *irc.freenode.net*, channel *#videolan*.

If you find a bug, please follow the instructions on the [bug reporting page](#).

1.3. Convention

1.3.1. Windows users

Some features are currently only available using the command line interface of VLC. To run such commands, use the Windows command line tool.

1.3.2. Unix users

Unix systems users : in this document, we adopt the following conventions for the Unix commands :

- commands that should be typed as *root* have a *#* prompt :

```
# command_to_be_typed_as_root
```

- commands that should be typed as a regular user have a *%* prompt :

```
% command_to_be_typed_as_regular_user
```

Chapter 2. Install the required software and hardware

2.1. Install VLC

There are VLC binaries available for the many OSES, but not for all supported OSES. If there are no binaries for your OS or if you want to change the default settings, you can compile VLC from sources.

2.1.1. Under Windows

VLC works under Windows 95/98/ME/2000/XP. Download the self-extracting file from the [VLC Windows download page](#). Launch the .exe to install VLC.

2.1.2. Under BeOS

Download the Zip file from the [VLC BeOS download page](#). Unzip the file in a directory to install VLC.

2.1.3. Under Mac OS X

Download the Mac OS X package from the [VLC MacOS X download page](#). Double-click on the icon of the package : an icon will appear on your Desktop, right beside your drive(s). Open it and drag the VLC application from the resulting window to the place where you want to install it (it should be /Applications).

2.1.4. Under Linux Debian

Edit as root /etc/apt/sources.list and add the following lines :

```
deb http://www.videolan.org/pub/videolan/debian $(ARCH)/
deb-src http://www.videolan.org/pub/videolan/debian sources/
```

Then install the packages :

```
# apt-get update
# apt-get install gnome-vlc libdvdcss2
```

2.1.5. Under Linux Mandrake

First, VLC is included in the [Mandrake Linux](#) distribution, thus if you are running *cooker*, just get it from you preferred cooker mirror.

As it is not possible to update softwares in a previous distributions, you have to install the RPMs "by hand" if you don't use *cooker*. The simplest way is to use *urpmi* (command line interface) or *rpmdrake* (you will find in the Mandrake Control Center). General instructions about *urpmi* can be found on <http://www.urpmi.org> (both in french and english). *urpmi-setup* will make it easier to setup *urpmi* to your needs: see <http://plf.zarb.org/~nanardon/>. You need at least to add main, contrib and plf sources.

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- get `libdvdplay`, `vlc`, `vlc-plugin-mad`, `vlc-plugin-a52`, `gnome-vlc` (or `vlc-gtk`) RPMs from this page and all the plugins you want.
- install them with:

```
# urpmi libdvdplay*rpm *vlc*rpm
```

(urpmi will complete all the dependencies)

2.1.6. Under Linux Redhat

Download the RPM package `vlc` and the packages listed in the *required librairies and codecs* section (the other packages are just optional) from the [VLC Red Hat download page](#) and put them all into the same directory.

Then install the RPM packages you have downloaded:

```
# rpm -U *.rpm
```

If you have not installed all the RPM packages included with your distribution, you may be asked to install a few of them first.

2.1.7. Compile the sources by yourself (for every other OS)

The method below is for any Unix system supported by VLC, for which there is no packages available. It explains how to compile and install VLC and the needed librairies from their source code.

You can also compile the VLC under Linux this way if you want to modify the default supported modules

2.1.7.1. Install the libraries

Many libraries are needed for particular uses :

- `libdvdcss` if you want to be able to read encrypted DVDs,
- `libdvdplay` if you want to have DVD menu navigation,
- `libdvbpsi` if you want to be able to read from the network,
- `a52dec` if you want to be able to decode the AC3 (i.e. A52) sound format often used in DVDs,
- `ffmpeg`, `libmad` and `faad2` if you want to read MPEG 4 / DivX files,
- `libogg` and `libvorbis` if you want to read Ogg Vorbis files.

Download the libraries from the [VLC sources download page](#).

For each library :

- uncompress :

```
% tar xvzf library.tar.gz
```

or

```
% tar xvjf library.tar.bz2
```

- configure :

```
% cd library
% ./configure --enable-shared
```

- compile and install :

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```
% make
# make install
```

Check that the configuration file `/etc/ld.so.conf` contains the following line :

```
/usr/local/lib
```

If the line is not present, add-it and then run (as root):

```
# ldconfig
```

2.1.7.2. Install VLC

Download the sources of the latest release : get the file `vlc-version.tar.gz` from the [VLC sources download page](#). Uncompress-it :

```
% tar xvzf vlc-version.tar.gz
% cd vlc-version
```

To get the list of configuration options, do :

```
% ./configure --help
```

Please note that all the modules are described in the *Modules* section of the [VLC User Guide](#).

Examples of very simple configurations:

- if you want a basic VLC, do :

```
% ./configure
```

- if you want the Gnome interface instead of the GTK interface (you will need the development packages of Gnome) :

```
% ./configure --enable-gnome
```

Then, compile and install :

```
% make
% su
Password: [Root Password]
# make install
```

Please note that the installation (**make install** command) is not mandatory. You can execute VLC from where you compiled it.

2.2. Install VLS

Full-featured VLS is currently only available for Linux. VLS can also be built on computers running Mac OS X, and is *not* available for Windows any more. Please visit the [streaming features page](#) for more information.

2.2.1. Install the librairies

Many librairies are needed for particular uses :

- *libdvbpsi* (always needed)
- *libdvdcss* if you want to be able to access encrypted DVDs,
- *libdv dread* if you want to be able to stream DVDs,
- *libdvb* if you want to be able to stream from a DVB card (a satellite card or a digital terrestrial TV card).

Download the librairies from the [VLS sources download page](#).

For each library, uncompress, configure (unless for *libdvb* which doesn't have a *./configure*), compile and install :

```
% tar xvzf library.tar.gz
% cd library
% ./configure --enable-shared
% make
# make install
```

Check that the configuration file `/etc/ld.so.conf` contains the following line :

```
/usr/local/lib
```

If the line is not present, add-it and then run :

```
# ldconfig
```

2.2.2. Install VLS

Download the sources of the latest release : get the file `vls-version.tar.gz` from the [VLS sources download page](#). Uncompress-it :

```
% tar xvzf vls-version.tar.gz
% cd vls-version
```

To get the list of configuration options, do :

```
% ./configure --help
```

Then configure vls :

- if you want a basic VLS without DVD support, do :

```
% ./configure --disable-dvd
```

- if you want a VLS with DVD support, do :

```
% ./configure
```

- if you want a VLS with DVB support, do :

```
% ./configure --enable-dvb
```

Then, compile and install :

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```
% make  
# make install
```

You can also do a **make uninstall**, **make clean** or **make distclean** as needed.

Chapter 3. Receive a stream

3.1. Receive a stream with VLC

3.1.1. Receive an unicast stream

Launch VLC, click on the *Net* button, select *UDP*, keep the default port and click on *OK*.

You can also use the following command line :

```
% vlc udp:
```

3.1.2. Receive a multicast stream

Launch VLC, click on the *Net* button, select *UDP Multicast*, type the multicast IP address, keep the default port and click on *OK*.

You can also use the following command line :

```
% vlc udp:@239.255.12.42
```

where *239.255.12.42* is the multicast IP address you want to join.

3.1.3. Receive an HTTP/FTP/MMS stream

Launch VLC, click on the *Net* button, select *HTTP/FTP/MMS*, type the URL and click on *OK*.

You can also use the following command line :

- ```
% vlc http://localhost/stream.ps
```

where *http://localhost/stream.ps* is the HTTP address of the stream ;

- ```
% vlc ftp://localhost/stream.ps
```

where *ftp://localhost/stream.ps* is the FTP address of the stream ;

- ```
% vlc mms://viptvr.yacast.fr/encoderfranceinfo
```

where *mms://viptvr.yacast.fr/encoderfranceinfo* is the MMS address of the stream.

---

## 3.2. Receive a stream with a Set Top Box

Some [Pace](#) and [Aminocom](#) set top boxes have Ethernet cards and can read MPEG2-TS over UDP streams. We had some reports that they work with the VideoLAN streamers.

---

# Chapter 4. Stream a file

## 4.1. Stream a file with VLC

```
% vlc /media/video/video1.avi --sout udp://192.168.0.42 --ttl 12
```

where :

- `/media/video/video1.avi` is the file you want to stream,
- `192.168.0.42` is either :
  - ◆ the IP address of the machine you want to unicast to ;
  - ◆ or the DNS name the machine you want to unicast to ;
  - ◆ or the multicast IP address.
- `12` is the value of the TTL (Time To Live) of your IP packets (which means that the stream will be able to cross 11 routers).

If you want to stream the file continuously, add the `--loop` option.



Under Windows, make sure that you are in the same directory as the VLC install directory.

---

## 4.2. Stream a file with VLS

```
% vls -vv -d udp:192.168.0.42 file:/media/video/video1.vob --ttl 12
```

where :

- `/media/video/video1.vob` is the file you want to stream,
- `192.168.0.42` is either :
  - ◆ the IP address of the machine you want to unicast to ;
  - ◆ or the DNS name the machine you want to unicast to ;
  - ◆ or the multicast IP address.
- `12` is the value of the TTL (Time To Live) of your IP packets (which means that the stream will be able to cross 11 routers).

When you want to stop VLS, use the key combination **Ctrl-c**.

If you want to stream the file continuously, add the `--loop` option.

---

## Chapter 5. Stream a DVD



Under Unix/Linux, you must have write access to the device corresponding to your DVD drive. For that, you should be in the *disk* or *cdrom* group (look at the permissions in `/dev`). If you're not, add yourself to the group :

```
adduser your_login disk_or_cdrom
```

and then restart your session.

---

### 5.1. Stream a DVD with VLC

```
% vlc dvdold:/dev/dvd --sout udp://192.168.0.12 --ttl 12
```

where :

- `/dev/dvd` is the device corresponding to your DVD drive (put `D:` under Windows if `D` is the letter of your DVD drive) or the directory where you copied your DVD,
- `192.168.0.12` is either :
  - ◆ the IP address of the machine you want to unicast to ;
  - ◆ or the DNS name the machine you want to unicast to ;
  - ◆ or the multicast IP address.
- `12` is the value of the TTL (Time To Live) of your IP packets (which means that the stream will be able to cross 11 routers).

If you want to stream the DVD continuously, add the `--loop` option.

---

### 5.2. Stream a DVD with VLS

```
% vls -vv -d udp:192.168.0.12 dvd:/dev/dvd --ttl 12
```

where :

- `/dev/dvd` is the device corresponding to your DVD drive (put `D:` under Windows if `D` is the letter of your DVD drive) or the directory where you copied your DVD,
- `192.168.0.12` is either :
  - ◆ the IP address of the machine you want to unicast to ;
  - ◆ or the DNS name the machine you want to unicast to ;
  - ◆ or the multicast IP address.
- `12` is the value of the TTL (Time To Live) of your IP packets (which means that the stream will be able to cross 11 routers).

If you want to stream the DVD continuously, add the `--loop` option.

---

# Chapter 6. Stream a DVB channel (satellite or digital terrestrial TV)

## 6.1. Install the DVB drivers

If you want to be able to stream from a DVB card (a satellite card or a digital terrestrial TV card), you need to install the DVB drivers. Download the latest release of the DVB drivers from the [DVB drivers download page](#) of the [LinuxTV](#) Project.

Uncompress the tarball and follow the instructions written in the `INSTALL` file to compile and install the drivers.

---

## 6.2. Stream with VLS

Put a `.dvbrc` file containing the DVB channels (satellite or digital terrestrial TV channels) you want to stream in your home directory (some are provided in the `libdvb` tarball for the satellite channels).

Run VLS with the following command line :

```
% vls -vv -d udp:192.168.0.42 dvb:"EUROSPORT" --ttl 12
```

where :

- `"EUROSPORT"` is the channel you want to stream as written in your `~/ .dvbrc` file,
  - `192.168.0.42` is either :
    - ◆ the IP address of the machine you want to unicast to ;
    - ◆ or the DNS name the machine you want to unicast to ;
    - ◆ or the multicast IP address.
  - `12` is the value of the TTL (Time To Live) of your IP packets (which means that the stream will be able to cross 11 routers).
-

# Chapter 7. Stream from an MPEG encoding card

 Streaming from a Kfir card is only supported under Linux.

---

## 7.1. Install the drivers

If you want to be able to stream from a Kfir card, you need to install its Linux drivers. Download the latest release of the drivers from the [drivers download page](#) of the [LinuxTV](#) Project.

Uncompress the tarball and follow the instructions written in the README file to compile and install the drivers.

 If you have a VIA chipset, you need to disable USB in the BIOS.

---

## 7.2. Stream with VLC

```
% vlc kfir:/dev/video --sout udp:192.168.0.42 --ttl 12
```

where :

- `/dev/video` is the device corresponding to the Kfir card,
  - `192.168.0.42` is either :
    - ◆ the IP address of the machine you want to unicast to ;
    - ◆ or the DNS name the machine you want to unicast to ;
    - ◆ or the multicast IP address.
  - `12` is the value of the TTL (Time To Live) of your IP packets (which means that the stream will be able to cross 11 routers).
- 

## 7.3. Stream with VLS

There is no command line interface for this input for the moment... so you will have to use the configuration file.

Here is a typical configuration file `vls.cfg` to run VLS with a kfir encoding card:

```
vls.cfg (VLS configuration file)
Example of the VideoLAN HOWTO for the Kfir encoding card

BEGIN "Inputs"

 kfir = "video"

END

BEGIN "kfir"

 # Kfir device
 Device = "/dev/video"
```

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```
Stream type (default is "Mpeg2-PS")
Type = "Mpeg2-PS"

END

BEGIN "Channels"

 channell = "network"

END

BEGIN "channell"

 # Unicast or multicast IP address
 DstHost = "192.168.0.42"

 # Destination port
 DstPort = "1234"

 # If it's a multicast IP address, uncomment the line below
 #Type = "multicast"

 # If it's a multicast IP address, set the "Time To Live" below
 #TTL = "12"

END

BEGIN "LaunchOnStartUp"

 command1 = "start video channell kfir"

END
```

Once you have adapted the configuration file above, run VLS:

```
% vls -vv -f vls.cfg
```

# Chapter 8. Stream from an acquisition card

 This feature is available on Linux only.

---

## 8.1. Install the Video for Linux drivers

If you want to stream from an acquisition card, a video4linux driver must be available for it. You can find more information about video4linux and supported devices [here](#).

Compile the right module for your device, and insert it into your kernel (Some video4linux modules are shipped with the 2.4.x Linux kernels). You can test your device by using any of the listed programs in the *Video: TV and PVR/DVR* section of [this page](#).

Note that v4l2 modules will also work with VLC.

---

## 8.2. Stream with VLC

 This feature is not available in vlc 0.5.3, but it is in CVS.

 If you're building vlc from sources, you must specify `--enable-v4l` to `./configure` to use this feature.

```
% vlc v4l:/dev/video:channel=0:frequency=8052:norm=secam:size=vga --sout udp:192.168.0.42 --ttl 12
```

where :

- `/dev/video` is the device corresponding to your acquisition card,
  - *frequency*, *norm* and *size* are parameters passed to your card,
  - `192.168.0.42` is either :
    - ◆ the IP address of the machine you want to unicast to ;
    - ◆ or the DNS name the machine you want to unicast to ;
    - ◆ or the multicast IP address.
  - `12` is the value of the TTL (Time To Live) of your IP packets (which means that the stream will be able to cross 11 routers).
- 

## 8.3. Stream with VLS

 When you compile VLS, you must do a `./configure --enable-v4l --with-ffmpeg=PATH` (where *PATH* is the absolute path to the directory where you compiled ffmpeg, and not the relative path !).

There is no command line interface for this input for the moment... so you will have to use the configuration file.

Here is a typical configuration file `vls.cfg` for a v4l device :

```
vls.cfg (VLS configuration file)
```

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```
Example of the VideoLAN HOWTO for the Video for Linux input

BEGIN "Inputs"

 webcam = "v4l"

END

BEGIN "webcam"

 # V4L device
 Device = "/dev/video"

 # Channel Source : Webcam is often "0"
 # TV Card, may be Tuner(0), Composite(1), Svideo(2)
 Channel = "0"

 # Norm: PAL=0, NTSC=1, SECAM=2
 Norm = "0"

 # Size possibilities: can be either:
 # - empty string : default size
 # - width x height
 # - subQCIF(128x96), QSIF(160.120), QCIF(176x144), SIF(320x240),
 # CIF(352x288), VGA (640x480)
 Size = ""

 # DeInterlace: "0" = no ; "1" = yes
 DeInterlace = "0"

 # Video compression format: "mpeg1" or "mpeg4"
 Compression = "mpeg4"

 # Video bitrate (approx.) in kbps
 Bitrate = "500"

 # Quality: "1.0" (good) to "31.0" (bad)
 Quality = "1.0"

 # Sound device
 AudioDevice = "/dev/dsp"

 # Audio compression format: "mp2", "mp3" or "ogg"
 AudioCompression = "mp2"

 # Audio bitrate in kbps
 AudioBitrate = "64"

 # Audio frequency ("16000", "22050", "24000", "32000", "44100" or "48000")
 AudioFreq = "16000"

 # Audio channel: "1" = mono ; "2" = stereo
 AudioChannel = "2"

END

BEGIN "Channels"

 channel1 = "network"

END
```

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```
BEGIN "channell"

Unicast or multicast IP address
DstHost = "192.168.0.42"

Destination port
DstPort = "1234"

If it's a multicast IP address, uncomment the line below
#Type = "multicast"

If it's a multicast IP address, set the "Time To Live" below
#TTL = "12"

END

BEGIN "LaunchOnStartUp"

 command1 = "start v4l channell webcam"

END
```

Once you have adapted the configuration file above, run VLS:

```
% vls -vv -f vls.cfg
```

# Chapter 9. Video On Demand

## 9.1. Overview

With Video On Demand (VOD), the user can start the video when he wants, make pauses, go forward and back in the video. It is of course the best in video streaming and the dream for every user.

VOD is a very big consumer of resources for the server and the network. VOD is unicast, not multicast : this means that the network and server resources needed are directly proportional to the number of clients.

The design of VideoLAN's VOD solution is very simple. The idea is to do HTTP streaming, i.e. stream an MPEG video encapsulated in HTTP. The regulation of the bitrate between the client and the server is done automatically by TCP. With HTTP version 1.1, there is the possibility to seek in a file downloaded, that's what we use to seek in the video.

---

## 9.2. On the server side

On the VOD server, you need a running Web server. For example, you can use a Linux server running Apache. Other operating systems and other Web servers should work too, but we have never tested.

Make your MPEG-1, MPEG-2 or MPEG-4 / DivX files available to the clients on the Web server.

For example, we have a Web server whose DNS name is *localserver*. On this server, we put an MPEG file `video1.mpg` which will be available to the clients at the URL `http://localserver/test/video1.mpg`.

---

## 9.3. On the client side

Launch VLC, then click on the *Net* button or select in the menu *File / Network stream*, select *HTTP* and type the URL `http://localserver/test/video1.mpg`.

VLC starts to read the stream nearly immediately and you can seek in the stream, make pauses, etc... as if the stream was a local file.

---

# Chapter 10. Add a channel information service

Typing multicast addresses is not very fun... that's why you need a channel information service ! VideoLAN has implemented a channel information service based on the SAP/SDP standard. The mini-SAP-server sends announces about the multicast programs on the network (via the multicast address *224.2.127.254* reserved for this purpose), and VLCs receive these announces and automatically add the programs announced to their playlist.

---

## 10.1. Install and configure the mini-SAP-server

 The mini-SAP-server is only available for Linux.

Download the latest version of the mini-SAP-server from the [streaming download page](#).

Install-it:

```
% tar xvzf miniSAPserver-version.tar.gz
% cd miniSAPserver-version
% make
```

Edit the configuration file `sap.cfg` shipped with the tarball. It should contain a global section with the Time To Live of the SAP announces and a section per program announced. Use the comments to understand each parameter.

The Time To Live option indicates the maximum number of routers that the SAP announce packets can cross before being dropped.

---

## 10.2. Run the mini-SAP-server

Start the mini-SAP-server :

```
% ./sapserver -c sap.cfg
```

If you want to run the mini-SAP-server in the background, use the `-d` command line switch. For instance:

```
% ./sapserver -d -c sap.cfg
```

You can also omit the `-c` command line switch if your config file is `/etc/sap.cfg`.

---

## 10.3. Configure VLC(s) to listen to the SAP announces

Start VLC with the following command line:

```
% vlc --extraintf sap
```

Then open the playlist : you should see the programs announced. When you double-click on the name of a program, VLC will subscribe to the multicast address and start to play the stream !



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Version 1.2, November 2002

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