

# **VideoLAN Quickstart**

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# VideoLAN Quickstart

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## Abstract

This document describes how to start using VideoLAN quickly.

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# Table of Contents

1. Introduction .....	1
What is the VideoLAN project ? .....	1
Overview .....	1
VideoLAN software .....	1
What is a codec ? .....	2
How can I use VideoLAN ? .....	3
Documentation .....	3
User support .....	3
Command line usage .....	4
Open a terminal .....	4
2. VLC, the universal media player .....	6
Installing VLC .....	6
Windows .....	6
BeOS .....	6
Mac OS X .....	6
Debian GNU/Linux .....	6
Linux Mandrake .....	7
Linux Redhat .....	7
Compile the sources by yourself (for every other OS) .....	7
Running VLC .....	9
Read a file .....	9
Read a DVD or a VCD .....	9
Troubleshooting .....	10
3. Stream and receive with VLC .....	11
Unicast an MPEG-1, MPEG-2, or MPEG-4 / DivX file .....	11
Unicast a DVD .....	11
Multicast to several VLC's .....	12
4. Video On Demand .....	13
Overview .....	13
On the server side .....	13
On the client side .....	13
5. Add a channel information service .....	14
Send announces when streaming with VLC .....	14
Start VLC(s) on the client(s) .....	14
6. Conclusion .....	15
A. GNU Free Documentation License .....	16
PREAMBLE .....	16
APPLICABILITY AND DEFINITIONS .....	16
VERBATIM COPYING .....	17
COPYING IN QUANTITY .....	17
MODIFICATIONS .....	18
COMBINING DOCUMENTS .....	19
COLLECTIONS OF DOCUMENTS .....	20
AGGREGATION WITH INDEPENDENT WORKS .....	20
TRANSLATION .....	20
TERMINATION .....	20
FUTURE REVISIONS OF THIS LICENSE .....	20
ADDENDUM: How to use this License for your documents .....	21

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## List of Figures

1.1. Global VideoLAN solution .....	1
1.2. Windows terminal .....	4
1.3. Linux X terminal .....	4
1.4. Mac OS X terminal .....	5
1.5. BeOS terminal .....	5

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# Chapter 1. Introduction

## What is the VideoLAN project ?

### Overview

VideoLAN is a complete software solution for video streaming, developed by students of the Ecole Centrale Paris [<http://www.ecp.fr>] and developers from all over the world, under the GNU General Public License [<http://www.gnu.org/copyleft/gpl.html>] (GPL). VideoLAN is designed to stream MPEG videos on high bandwidth networks.

The VideoLAN solution includes :

- VLS (VideoLAN Server), 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,
- VLC (initially VideoLAN Client), which can be used as a server to stream MPEG-1, MPEG-2 and MPEG-4 files, DVDs and live videos 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 [<http://www.videolan.org/>].

## VideoLAN software

### VLC

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

- MPEG-1, MPEG-2 and MPEG-4 / DivX files from a hard disk, a CD-ROM drive, ...
- DVDs and VCDs,
- from a satellite card (DVB-S),
- 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,
- DVDs,
- from 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*,

in IPv4 or IPv6 .

To get the complete list of VLC's possibilities on each platform supported, see the VLC features page [<http://www.videolan.org/vlc/features.html>].

## Note

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

## VLS

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 (DVB-S) or a digital terrestrial television card (DVB-T) ,
- 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*,

in IPv4 or IPv6 .

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 Windows. To get the complete list of VLS's possibilities on each platform supported, see the streaming features page [<http://www.videolan.org/streaming/features.html>].

## Mini-SAP-server

You can add a channel information service based on the SAP/SDP standard to the VideoLAN solution. The mini-SAP-server sends announces about the multicast programs on the network in IPv4 or IPv6, and VLCs receive these announces and automatically add the programs announced to their playlist.

The mini-SAP-server works under Linux and Mac OS X.

## What is a codec ?

To fully understand the VideoLAN solution, you must understand the difference between a *codec* and a *container format*

- A *codec* is a compression algorithm, used to reduce the size of a stream. There are audio codecs and video codecs. MPEG-1, MPEG-2, MPEG-4, Vorbis, DivX, ... are codecs

- A *container format* contains one or several streams already encoded by codecs. Very often, there is an audio stream and a video one. AVI, Ogg, MOV, ASF, ... are container formats. The streams contained can be encoded using different codecs. In a perfect world, you could put any codec in any container format. Unfortunately, there are some incompatibilities. You can find a matrix of possible codecs and container formats on the features page [<http://www.videolan.org/streaming/features.html>]

To decode a stream, VLC first *demuxes* it. This means that it reads the container format and separates audio, video, and subtitles, if any. Then, each of these are passed *decoders* that do the mathematical processing to decompress the streams .

There is a particular thing about MPEG:

- MPEG is a *codec*. There are several versions of it, called MPEG-1, MPEG-2, MPEG-4, ...
- MPEG is also a container format, sometimes referred to as *MPEG System*. There are several types of MPEG: ES, PS, and TS

When you play an MPEG video from a DVD, for instance, the MPEG stream is actually composed of several streams (called Elementary Streams, ES): there is one stream for video, one for audio, another for subtitles, and so on. These different streams are mixed together into a single Program Stream (PS). So, the .VOB files you can find in a DVD are actually MPEG-PS files. But this PS format is not adapted for streaming video through a network or by satellite, for instance. So, another format called Transport Stream (TS) was designed for streaming MPEG videos through such channels.

## How can I use VideoLAN ?

### Documentation

The user documentation of VideoLAN is made up of 4 documents :

- the *VideoLAN Quickstart*. This document will give you a quick overview 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.
- the *VLS user guide*. This document is the complete guide for VLS.
- the *VideoLAN FAQ*. This document contains Frequently Asked Questions about VideoLAN.

The latest version of these documents can be found on the documentation page [<http://www.videolan.org/doc/>] .

You can also have a look at the VideoLAN Wiki [<http://wiki.videolan.org>]. This is a website that everyone can change. We use it to document everything that is not in the "official" documentation: the tips and tricks for each O.S., the graphical interfaces, etc...

### 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 [<http://www.via.ecp.fr/via/ml/videolan/index-en.html>]. There are two English-speaking mailing-lists for the users :

- [vlc@videolan.org](mailto:vlc@videolan.org) for the questions on VLC ,

- [streaming@videolan.org](mailto: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 [<http://www.videolan.org/support/lists.html>].

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 [<http://www.videolan.org/support/bug-reporting.html>] .

## Command line usage

- VLC has many different graphical interfaces, that are organized quite differently in order to be in harmony with the guidelines of each operating system supported. Documenting the use of each graphical interface is too long, and some features are only available via the command line interface. Therefore we decided to document only the command line interface, but in many cases it should be easy to guess how to use the graphical interface for the same use !
- VLS has a command line and a telnet interface, but no graphical interface !

All the commands that show up in this document should be typed inside a terminal. .

## Open a terminal

### Windows

Click on *Start, Run* and type :

- **cmd** **Enter** (Windows 2000 / XP),
- **command** **Enter** (Windows 95 / 98 / ME).

The terminal appears Le terminal apparait

**Figure 1.2. Windows terminal**

### Note

Under Windows, you need to be in the directory where the program is installed to run it.

### Linux / Unix

Open a terminal :

**Figure 1.3. Linux X terminal**

In the documentation, 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
```

## Mac OS X

Go to *Applications*, open the folder *Utilities* and double-click on *Terminal* :

### Figure 1.4. Mac OS X terminal

#### Note

Under Mac OS X, you need to be in the directory where the program is installed to run it, and start the command with `./`.

## BeOS

In the deskbar, go to *Application* and then *Terminal* :

### Figure 1.5. BeOS terminal

#### Note

Under BeOS, you need to be in the directory where the program is installed to run it, and start the command with `./`.

---

# Chapter 2. VLC, the universal media player

## Installing 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.

### Windows

VLC works under Windows 95/98/ME/2000/XP. Download the self-extracting file from the VLC Windows download page [<http://www.videolan.org/vlc/download-windows.html>]. Launch the .exe to install VLC.

### BeOS

Download the Zip file from the VLC BeOS download page [<http://www.videolan.org/vlc/download-beos.html>]. Unzip the file in a directory to install VLC.

### Mac OS X

Download the Mac OS X package from the VLC MacOS X download page [<http://www.videolan.org/vlc/download-macosx.html>]. 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).

### Debian GNU/Linux

#### Debian stable (woody)

Add the following lines to your `/etc/apt/sources.list`:

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

Then, for a normal install, do:

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

#### Debian unstable (sid)

Add the following lines to your `/etc/apt/sources.list`:

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

Then, for a normal install, do:

```
# apt-get update
# apt-get install wxvlc libdvdcss2
```

## Debian testing (sarge)

You should not be using Debian testing unless you perfectly know what you are doing. It is almost impossible to support Debian testing and there are no plans to do it. For more informations on Debian testing, please look: testing page [<http://www.debian.org/devel/testing>]

## Linux Mandrake

There are VLC packages for Mandrake 9.1 and cooker.

To install them, add the following sources for either Mandrake 9.1 or Cooker (you can use Easy urpmi [<http://plf.zarb.org/~nanardon/>] for that): *contrib* from the core distribution and *plf* (Penguin Liberation Front) from the external add-ons.

Then install the required packages with **urpmi**:

```
# urpmi libdvdcss2 libdvddplay0 wxvlc vlc-plugin-a52 vlc-plugin-ogg vlc-plugin-mad
```

## Linux Redhat

Download the RPM package *vlc* and the packages listed in the *required libraries and codecs* section (the other packages are just optional) from the VLC Red Hat download page [<http://www.videolan.org/vlc/download-redhat.html>] 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.

## 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 libraries from their source code.

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

## Install the libraries

Many libraries are needed :

- *libdvbpsi* (compulsory) ,
- *mpeg2dec* (compulsory) ,
- *libdvdcss* if you want to be able to read encrypted DVDs ,

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

Download the libraries from the VLC sources download page [<http://www.videolan.org/vlc/download-sources.html>].

For each library :

- uncompress :

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

or

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

- configure :

```
% cd library
% ./configure
```

- compile and install :

```
% 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
```

## Install VLC

Download the sources of the latest release : get the file `vlc-version.tar.gz` from the VLC sources download page [<http://www.videolan.org/vlc/download-sources.html>]. 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 [<http://www.videolan.org/doc/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 developement 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.

## Running VLC

### Read a file

```
% vlc -vvv video1.xyz
```

where `video1.xyz` is the name of the file you want to play.

### Read a DVD or a VCD

```
% vlc -vvv dvd:/dev/dvd
```

where `/dev/dvd` is the name of your drive (put `D:` under Windows if `D` is the letter of your DVD drive).

#### Note

If you are running 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.

## Troubleshooting

If VLC doesn't work for you, try to spot an error message in the logs that are printed in the terminal.

Then, read the vlc FAQ [<http://www.videolan.org/doc/faq/>] and have a look at the Bugzilla [<http://bugzilla.videolan.org/>] to see if it is a known issue.

If you can't find out the problem, explain it in English in the mailing-list *vlc@videolan.org* and copy-paste in your mail the messages of the message window.

---

# Chapter 3. Stream and receive with VLC

## Unicast an MPEG-1, MPEG-2, or MPEG-4 / DivX file

### Start VLC on the server

```
% vlc -vvv video1.xyz --sout udp:client.example.org
```

where `video1.xyz` is the file you want to stream and `client.example.org` is the DNS name of the client you want to stream to (you can put an IP address instead).

### Start VLC on the client

```
% vlc -vvv udp:
```

## Unicast a DVD

### Start VLC on the server

```
% vlc -vvv dvdold:/dev/dvd --sout udp:client.example.org
```

where `/dev/dvd` is the name of your DVD drive (put `D:` under Windows if `D` is the letter of your DVD drive) or the directory where you copied your DVD, and `client.example.org` is the DNS name of the client you want to stream to (you can put an IP address instead).

#### Note

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.

### Start VLC on the server

```
% vlc -vvv udp:
```

# Multicast to several VLC's

## What is multicast ?

Multicast is a norm implemented in all modern network hardware (switches, routers, ...). It provides an intelligent manner to send a stream to a dynamic group of machines. If you want to use multicast, make sure that all your network hardware support it.

In multicast streaming, the stream is sent to a multicast IP address (the IP addresses reserved for this purpose are from 224.0.0.0 to 239.255.255.255). Then, any machine on the network can join the multicast group by sending a request on the network, and it will automatically receive the stream. When it sends a request to leave the group, it will automatically stop receiving the stream. The advantage of multicast streaming is that only the machines that want to receive the stream actually receive it, and the streaming server only sends one stream even if there are multiple clients receiving it.

## Start VLC on the server

```
% vlc -vvv video1.xyz --sout udp:239.255.12.42 --ttl 12
```

where `video1.xyz` is the file you want to stream (replace it with `dvdold:/dev/dvd` under Unix or `dvdold:D:` under Windows if you want to multicast a DVD), `239.255.12.42` is the multicast IP address you want to stream on and `12` is the value of the TTL (Time To Live) of your IP packets (which means that the multicast stream will be able to cross 12 routers).

## Start VLC on the client(s)

```
% vlc -vvv udp:@239.255.12.42
```



---

# Chapter 4. Video On Demand

## 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.

## 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/video1.mpg`.

## On the client side

```
% vlc -vvv http://localserver/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 5. 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. VLC's stream output can send SAP announces when streaming (on the multicast address *224.2.127.254* reserved for this purpose). On the client side, VLCs receive these announces and automatically add the programs announced to their playlist.

### Send announces when streaming with VLC

To send announces with VLC, you need to use the complex syntax of VLC's stream output, like this:

```
% vlc -vvv video1.xyz --sout '#standard{access=udp,url=239.255.12.42,sap="Test Str
```

where *video1.xyz* is the file you want to stream, *239.255.12.42* is the multicast IP address you want to stream on, *Test Stream* is the name that will be used for this program in the SAP announces and *12* is the value of the TTL (Time To Live) of the stream and of the SAP announces.

### Start VLC(s) on the client(s)

Start VLC with the *sap* interface:

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

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

---

## Chapter 6. Conclusion

VideoLAN can do much more than what is explained in this Quickstart. For example, you can use VLC to display image walls or to transcode a stream on-the-fly. You can also use VLS to stream digital satellite channels and digital terrestrial TV channels. To know about the full possibilities of VideoLAN, please read the rest of the official documentation, that you can find on the documentation page [<http://www.videolan.org/doc/>].

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