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Lecture Structure:

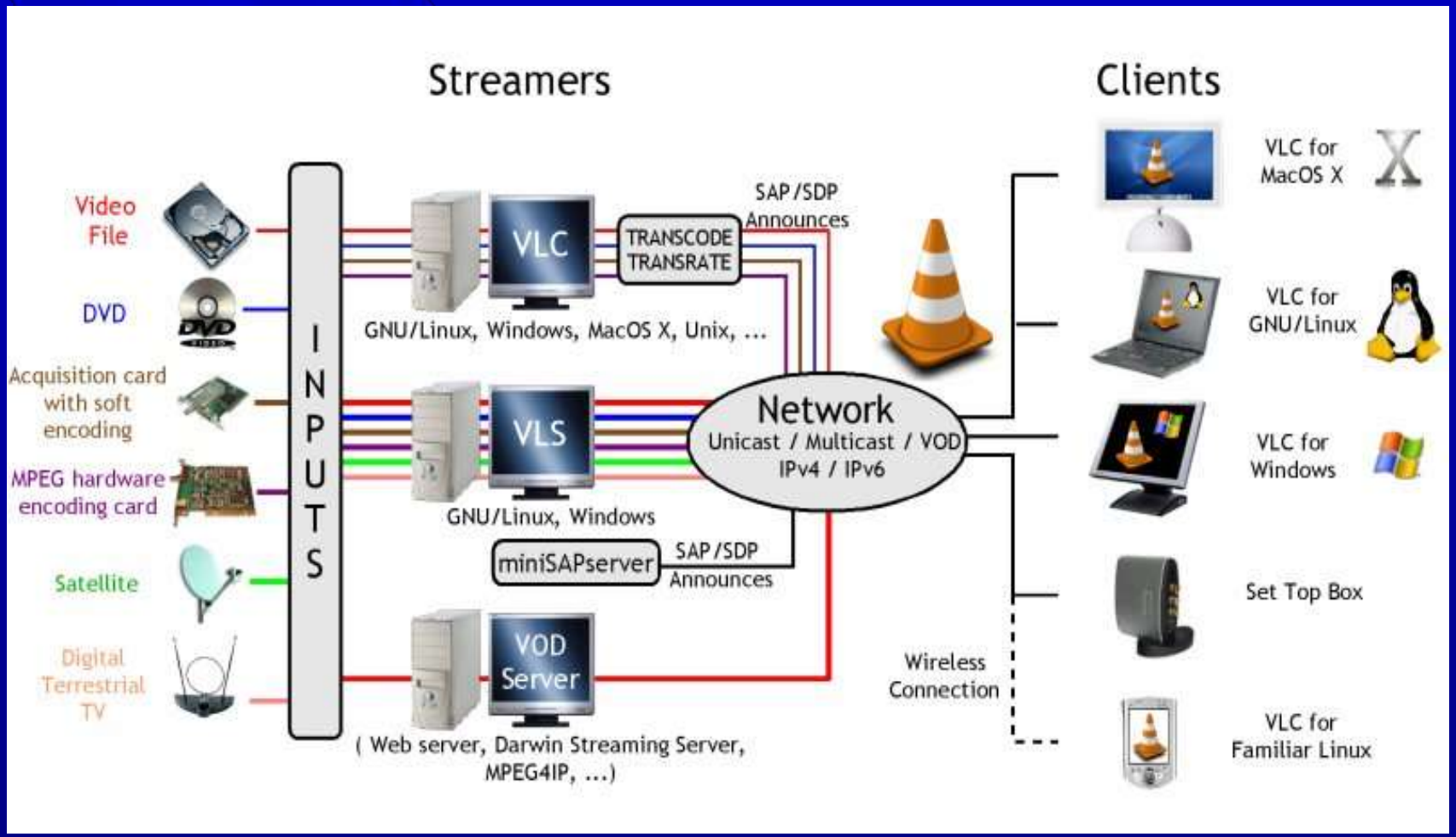
- Subject: An Introduction To VideoLan
  - What is it?
  - How do I install?
  - Stream something already!
  - Defucalties
  - Questions

What is it?

- Official description:
  - VideoLAN is a highly portable multimedia player for various audio and video formats as well as DVDs, VCDs, and various streaming protocols.
  - It can also be used as a server to stream in unicast or multicast in IPv4 or IPv6 on a high-bandwidth network.

What is it?

- Illustrated description:



What is it?

- Functional description:
  - Main program:

    vlc
  - Supports many interfaces:

    cli, curses, tk, wx, gtk, or http
  - Supports Many

    inputs, outputs, codecs, containers

What is it?

- Functional description (cont.):
  - Can transcode:

    convert codec and bit rate
  - Can stream:

    multicast HTTP(S) or unicast UDP
  - Use vlc not vls:

    vlc does all the stuff vls did, an more.
    and vls has a separate dev group

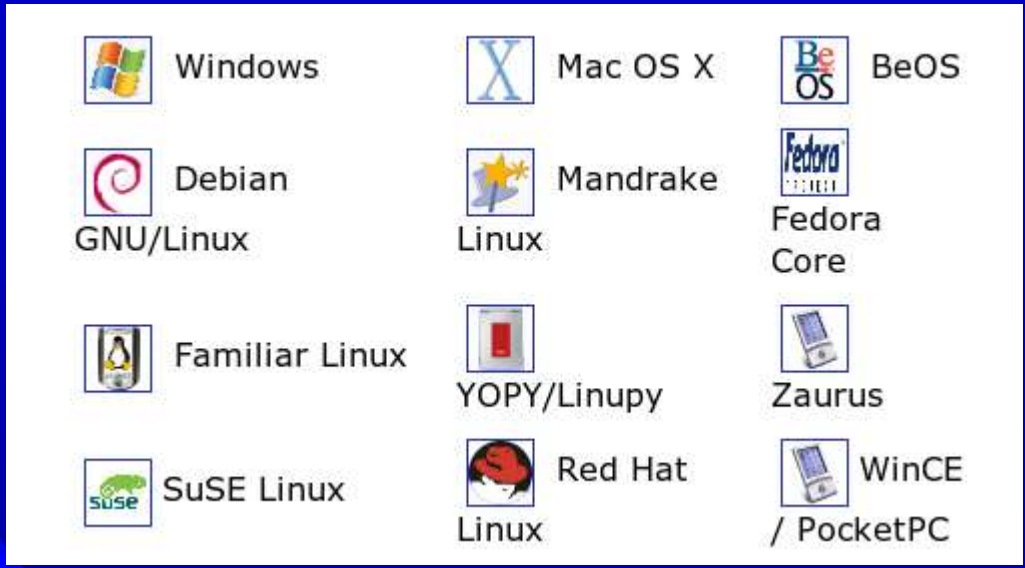
How do I install it?

- vlc relies on many libraries.

divx4linux
dvd-slideshow
faad2-devel
faad2-xmms-plugin
ffad2
gtkpod
libdvdnav
libvcd
libvcd-devel
libxine
mjpegtools
MPlayer
vcdimager
vlc
vlc-devel
vlc-mozillaplugin
w32codec-all

How do I install it?

- Binaries for distros:
  - Binaries make it easy



- Build package for other distros:

How do I install it?

- I used binaries:
  - 3rd party SuSE packages at:

http://packman.iu-bremen.de/suse

- Build libdevcss
  - Found a script (on the right) that builds an rpm for libdevcss from source and a script

```
Quickly install all my libs from packman
------------------------------------------------
Added url: http://packman.iu-bremen.de/suse/9.2 to SuSE RPM Sources
root # yast2 inst_source
    ->Add->http->
   ServerName: packman.iu-bremen.de
   Directory on Server: suse/9.2
root #  cd /usr/src/packages/SOURCES/

Make a libdvdcss rpm
---------------------------------------
Download the libdvdcss tar.bz2-file
root # wget http://download.videolan.org/pub/libdvdcss/1.2.8/libdvdcss-
1.2.8.tar.bz2
root # cd /usr/src/packages/
root # wget http://packman.links2linux.org/download.php?t=s&id=1022

root # wget http://packman.links2linux.de/download.php?t=s&id=4062
root # rpmbuild --rebuild  libcddb-0.9.6-0.pm.6.src.rpm
root # cd /usr/src/packages/RPMS/i586
root # rpm -i libcddb-0.9.6-0.pm.6.i586.rpm
root # rpm -i libcddb-devel-0.9.6-0.pm.6.i586.rpm
root # wget \
http://www.iiv.de/schwinde/buerger/tremmel/downloads/script_rpm4/install_lib
dvdcss2
root # chmod +x install_libdvdcss2
root # ./install_libdvdcss2
```

How do I install it?

- Why so many libs?
  - A library is needed for each codec, container, Input, and Output
  - The more libraries, the more functionality.

Terms and other Background:

codec: Acompression algorithm applied to audio or video stream.

i.e. MPEG-1, MPEG-2, MPEG-4, Vorbis, DivX

containers: Holds one or more encoded streams

i.e. AVI, Ogg, MOV, ASF, MPEG-TS,PS,

Note: Any Codec Won't Work In Every Container.
Table of I/O, codec, container support :
http://www.videolan.org/streaming/features.html

Confusion: MPEG is a codec

i.e. MPEG-1, MPEG-2, MPEG-4).

MPEG is also a container
i.e. MPEG: ES, PS, and TS

Stream Something Already!

- Streaming is pain.
  - Because the right codec and options have to be set this can be painful.
  - Consider your Target audience and what codecs they will have.
  - The gui and wizard didn't work for me, but I'll show a better method to learn.
  - Be prepared to debug.

Process of vlc:

1st. Separates the streams in the container (or demux).
2nd. Chooses a codec to decode each stream.
3rd. Decompress each stream (or decode).

Debugging vlc:

Use -vvv cli option
Use View->Messages with the gui
Use vlc -vvv <myfile> to determine container type.

This will show you see what codecs vlc thinks it should use. If an appropriate codec is not found, or other error, the stream will be dropped.

Sequence headers repeats in mpeg2, not mpeg1.

Call your MPEG-2 creations .vob

Call your MPEG-1 creations .mpg or mpeg

Stream Something Already!

- Steaming music from command line:
  - Start web interface on tcp port 5001,
  - play files randomly for ever,
  - keeping stream alive between songs,
  - send Stream Out through a transcode incantation, which decodes, encodes, and streams to http port 5002 in raw format.
  - The last statement is the source music directory /data/music.

  Note: No line breaks in the sout statement.

```
vlc -I http --http-host 192.168.0.14:5001-Z -L --sout-keep --sout \
'#transcode{acodec=mpga,ab=192,channels=2}:duplicate{dst=std
{access=http,mux=raw,url=192.168.0.14:5002}}' \
/data/music/
```

Stream Something Already!

- Steaming music from the GUI
  - Start the gui

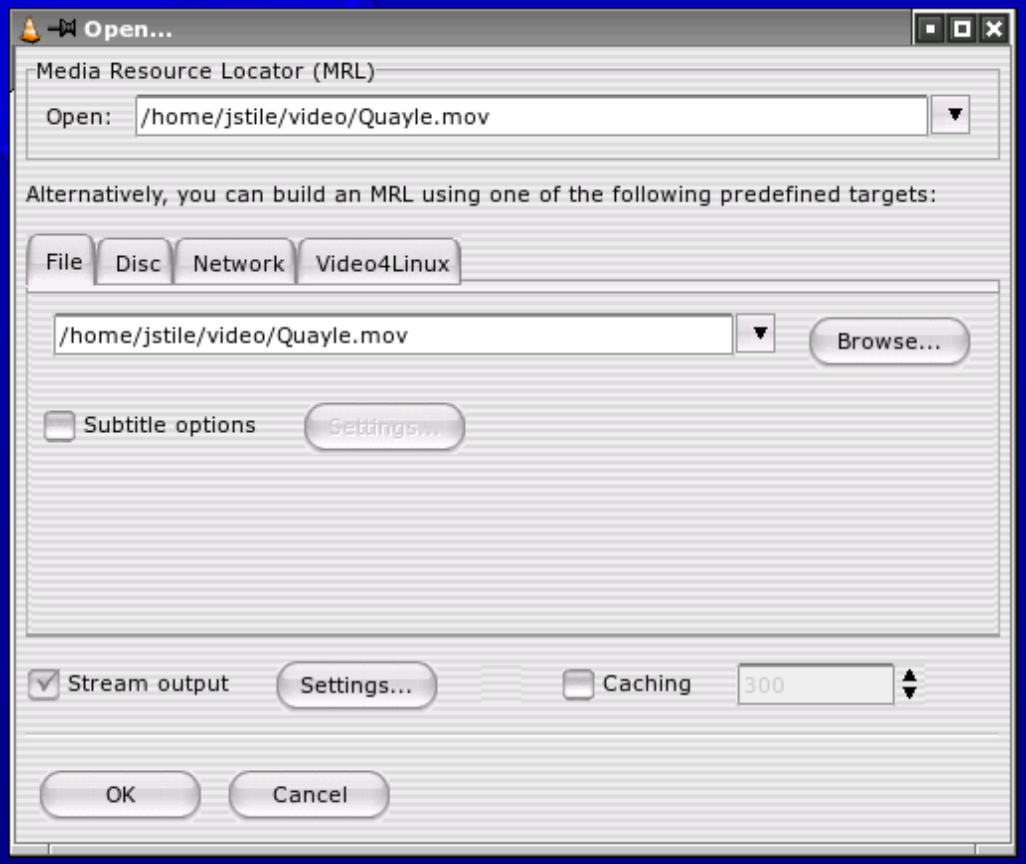
```
myhost:/root/ # vlc -I wx   ## Arguemnts to I include http, tk, curses
```

Stream Something Already!

- Steaming music from the GUI
  - Select: File->Open

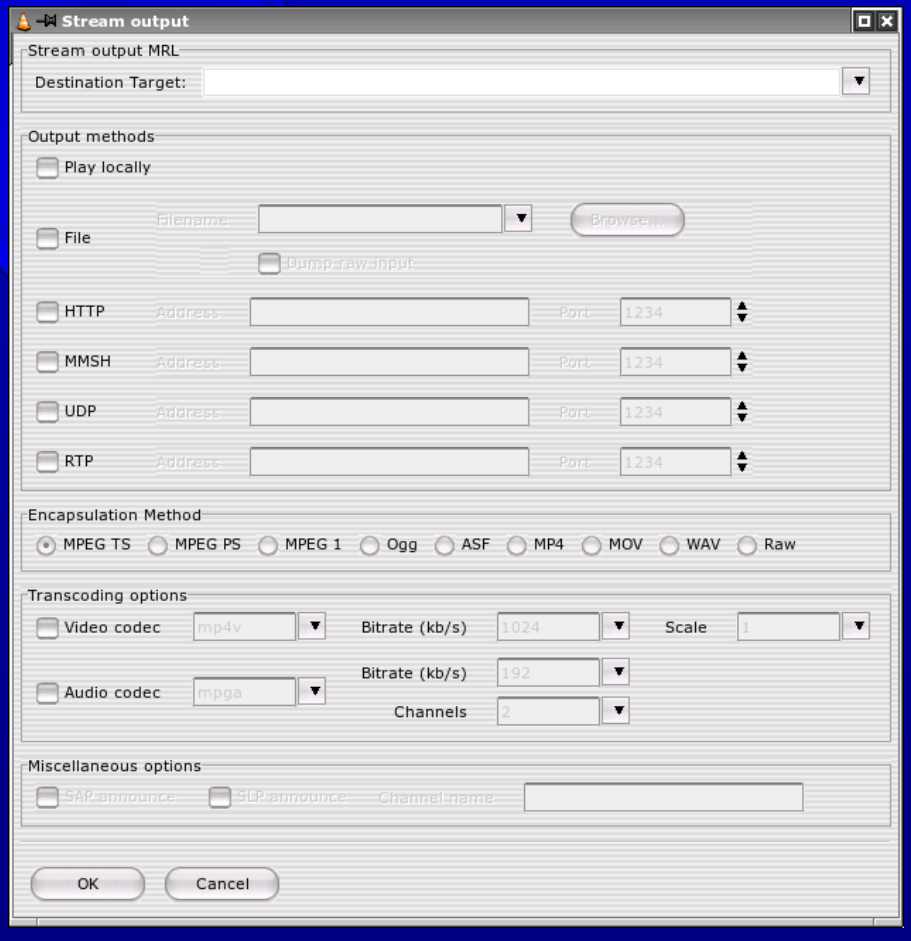
Stream Something Already!

- Steaming music from the GUI
  - Brows to your file, check 'Stream ouput' and click 'Settings'



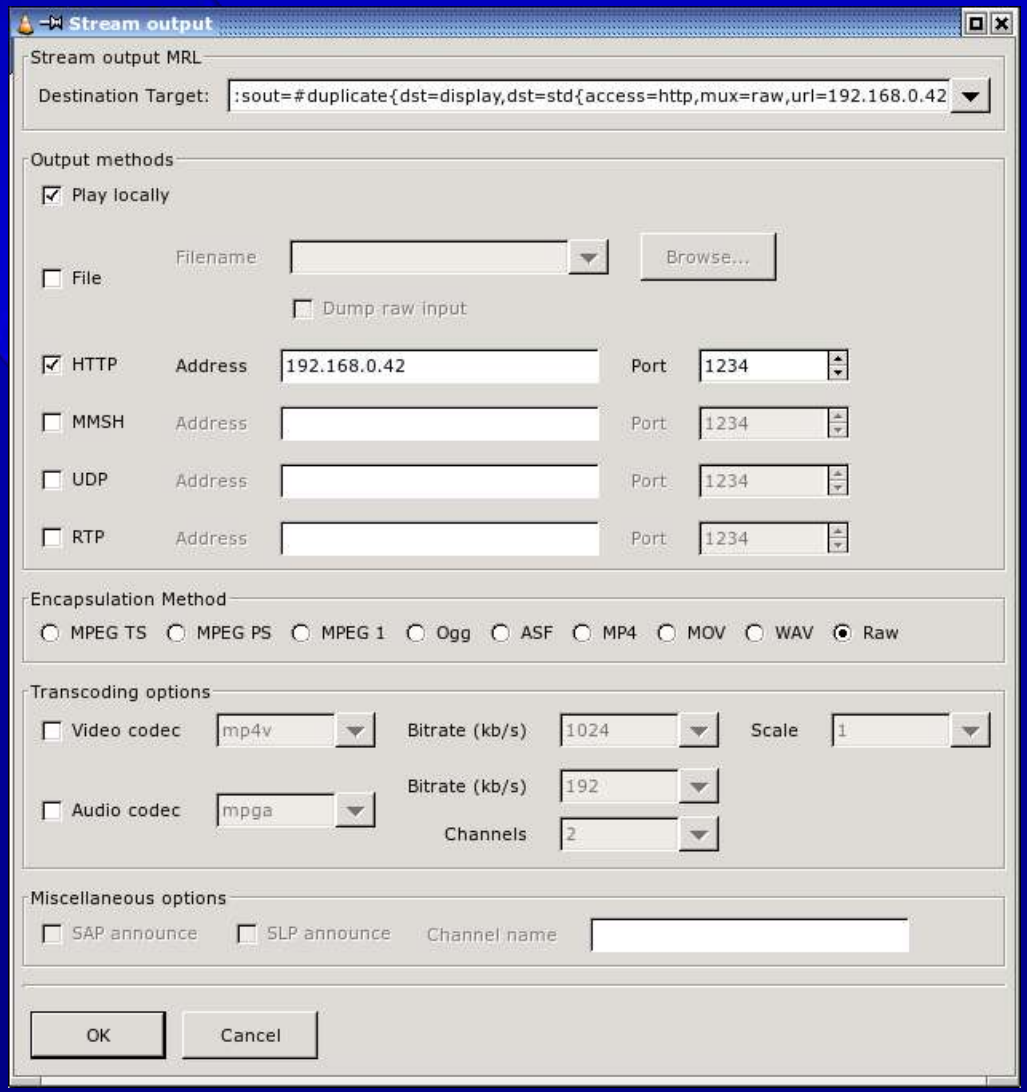
Stream Something Already!

- Steaming music from the GUI
  - As you fill in this form, Stream Output MRL 'Destination Target' will populate.



Stream Something Already!

- Steaming music from the GUI
  - These are all the options I have chose for my file.



Stream Something Already!

- Learn Stream out MRL from the GUI
  - The GUI shows a Stream Out MRL.

```
:sout=#duplicate{dst=display,dst=std{access=http,mux=raw,url=192.168.0.42:1234}}
```

  - You can take this and use it to construct a command line.

```
vlc  -I wx \
--sout '#duplicate{dst=display,dst=std{access=http,mux=raw,url=192.168.0.42:1234}}' \
/home/jstile/video/Quayle.mov
```

  - If you get stuck creating MRL, use the GUI for hints.

Stream Something Already!

- Learn Stream out MRL from the GUI
  - There are two valid Stream Out MRL formats:

```
FORMAT 1:
 vlc input_stream \
  --sout-module1-option1=... \
  --sout-module1-option2=... \
  --sout-module2-option1=... \
  --sout-module2-option2=... \
  ...

FORMAT 2:
 vlc input_stream \
 --sout "#module1{option1=parameter1{parameter-option1},option2=parameter2}:
#module2{option1=...,option2=...}:..."
```

Stream Something Already!

- Stream Out MRL
  - One or more module statements:
    - standard - sends stream via Access Output (UDP, HTTP, file, ...).
    - transcode - reencode with a different codec or bit rate.
    - duplicate - create independent output streams.
    - display - Stream to a display for normal viewing.
    - rtp - UDP stream.
    - es - Split Elementary Stream (separate audio/video output).
  - Each module takes different options.

```
vlc  -I wx \
--sout '#duplicate{dst=display,dst=std{access=http,mux=raw,url=192.168.0.42:1234}}' \
/home/jstile/video/Quayle.mov
```

Stream Something Already!

- Stream Out MRL
  - Example of the Standard module (each takes different options)
    - access= statement setting output-to method
      - file - name of save file
      - udp - udp stream with options:
        caching=, ttl=, group=, lage=, raw
      - http - http stream
        user=, pwd=, mime=[SFW,AVI,WAV,QT,MP2]
      - https - https stream
        same as above, plus cert=, key=, ca=, crl=
      - mmsh - steam with Microsoft mms
      - rtp - old and outdated. don't use.
    - mux= statement setting encapsulation method
      - options include ts,ps,mpeg1, ogg, afs, afsh, avi, mpjpg
    - url= statement setting specific path to output file or url ip/port.
    - More options... see http://videolan.org/doc/streaming-howto/en/ch03.html

Stream Something Already!

- Bandwidth requirements:
  - This technology was designed for high bandwidth networks.
  - These are some number from videolan.org

Throughput	Codec
0.5 to 4.0 Mbits/s	MPEG-4
3.0 to 4.0 Mbits/s	MPEG-2
6.0 to 9.0 Mbits/s	DVD

Defucalties

- Slow hardware:
  - The Client doesn't matter too much.
  - The Server is critical.

  My server works great with a 1.5GHz AMD + 500Mb SDRAM

  But my ThinkPad cant do it, with a PII366 + 200Mb RAM
- Choosing the correct codec and container options
  - I am still having problems with it.

Sources:

- Template for OpenOfficeImpress:
  - http://ooextras.sourceforge.net/downloads/simpress/
- VideoLan Docs:
  - http://www.videolan.org/streaming/features.html
  - http://videolan.org/doc/
    - VLC Play-Howto
    - VLC streaming-Howto
    - VLS user guide
    - VideoLAN FAQ
    - VLC streaming (ch3 “structure of Streaming output (--sout)”)

QUESTIONS:

- ??