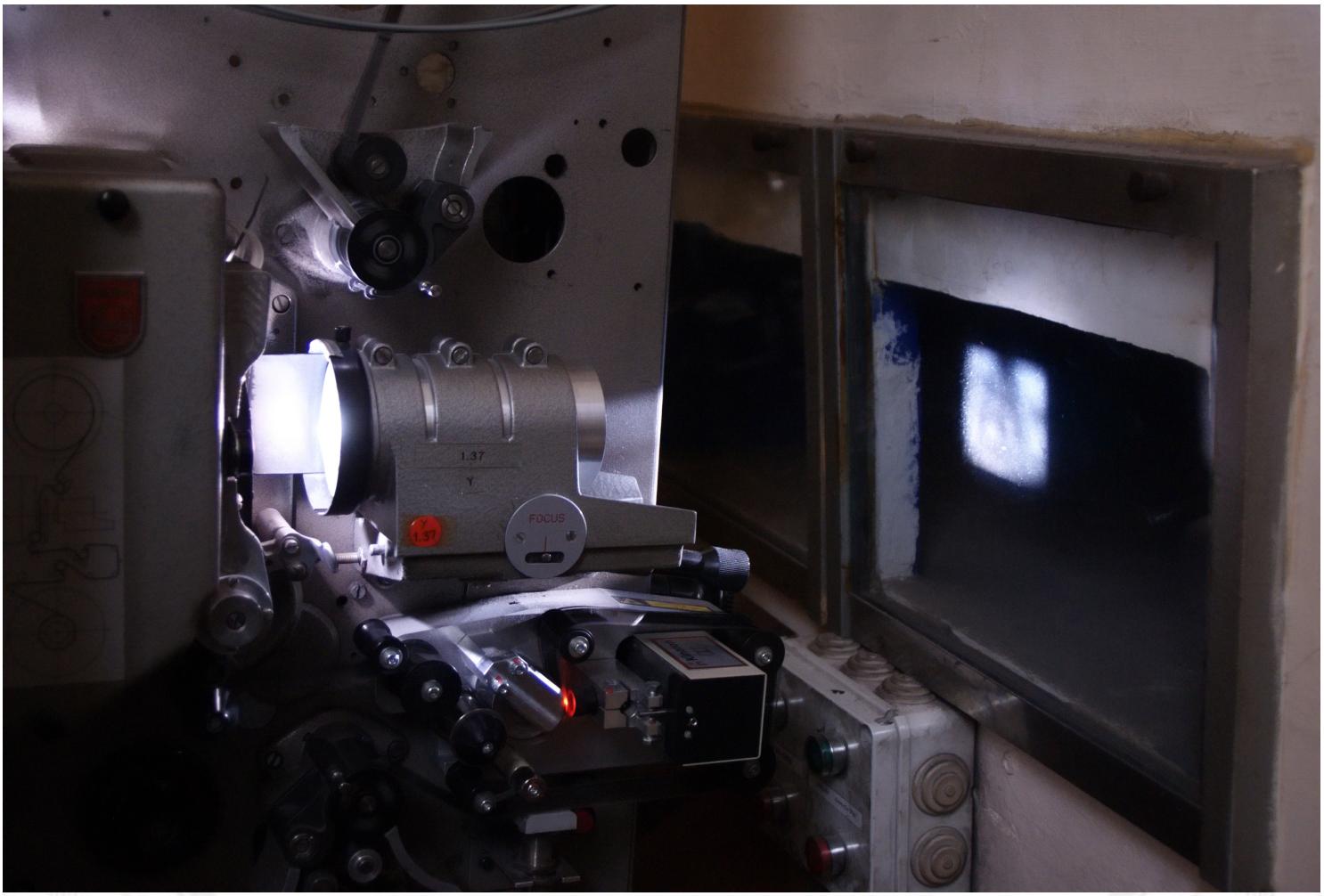
The Media Streaming Journal

April 2016



Covering Audio and Video Internet Broadcasting

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publicdomainvectors.org/en/free-clipart/Vintage-microphone-vector-graphics/6111.html

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Welcome to The Media Streaming Journal

Greetings,

The concept of niche content has been drilled into the heads of website content creators for years. Offering unique content sets you in a different category from other website and much an easier way to promote your unique content. The same can be said for Internet broadcasting.

Local over the air broadcasters have a limited audience potential, so it is to their advantage to provide content that will view or listened to by the greatest number of people. Broadcasting on a global scale provides access to a far greater audience potential for both mainstream and niche content consumers. Niche content consumers also tend to be more dedicated to websites or stations that they enjoy.

Think outside the box and reach for the stars!

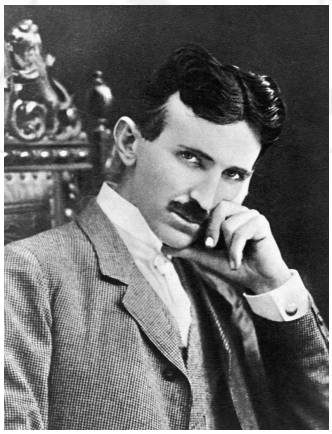
Please feel free to contact either the Publication Director (Derek Bullard) or myself if you have any questions or comments regarding The Media Streaming Journal.

Namaste

David Childers

www.linkedin.com/pub/david-childers/4/736/72a

The Grand Master of Digital Disaster
(Editor In Chief)



Our virtues and our failings are inseparable, like force and matter. When they separate, man is no more.

Nikola Tesla

http://commons.wikimedia.org/wiki/File:N.Tesla.JPG

The Media Streaming Journal

What is in this edition of the Media Streaming Journal

Youtube Live Streaming
David Childers

- Preparing Youtube Live Streaming

- The Stream Sourcing Process

- General Notes About The FFmpeg Bash Shell Script Command

- Using FFmpeg For Other Tasks

- Youtube Live Streaming Extras

- Linux Commands

Magazine cover graphic:
https://commons.wikimedia.org/wiki/File:Projecteur_cin%C3%A9matographique_35mm.jpg

RADIOSOLUTION

www.radiosolution.info

Our Mission

Let our friendly, knowledgeable staff assist you to build your project, such as an online radio station using our high end reliable video and audio streaming technologies. We want to become your partner for all your hosting needs, as well as your one stop shop for radio products such as custom DJ drops and radio ID's.

Start An Internet Radio Station

Whatever you need to start Internet radio station, we will deliver! We provide high quality Internet Radio services to make your music radio project a success. We can provide Wowza, Icecast, SHOUTcast hosting and internet radio services to hobbyists, deejays, amateurs and established professionals. No radio station client is too big or too small for Radiosolution.

Choose between complete hassle-free service packages or new features to add to start internet radio station. Benefit from customized services and the latest in internet radio technology. You will receive professional, personalized and better Internet Radio Station services than you have received up till now. If you already have an Icecast or SHOUTcast hosting provider, we can still help you transfer your radio server over to us with no hassle and at no charge.

Internet Radio Station Services

Launch your internet, digital, satellite or AM/FM radio station anywhere in the world with all of the right tools. A broadcasting specialist is on standby to help you get started with an SHOUTcast or Icecast hosting package. We have servers ready for reliable streaming in North America and Europe. Our hosting packages have all the features you need to make your radio station project a success.

If you stream live or with an Auto DJ, we can provide you with the latest in web-based Cloud technology. You will love the simple to use control panel. Discover how easy it is to manage live deejays, upload fresh music and create custom scheduled programming. You will be able to track your listeners by getting real time statistics.

Starting your own Internet radio has never been easier. Get in touch with us anytime to start your Internet radio station.

Radiosolution is a SHOUTcast hosting provider located in Quebec Canada. We also offer Icecast, Wowza and Web Hosting services. Contact us to discuss the best option available as you start internet radio station. Radiosolution can provide personalized service in English, Dutch, and French. Starting an internet radio station can be intimidating, many people want to start one, but have no idea where to start. Radiosolution will be there for you every step of the way. Everyday people are searching the internet for free SHOUTcast servers. With Radiosolution SHOUTcast hosting we will allow you to try our services for FREE. By trying our services, you can be confident that you have chosen the best radio server hosting provider. You have nothing to loose because we offer a 30 day satisfaction guarantee. What are you waiting for? Contact us now! Radiosolution offers everything you need to start internet radio station. You will not need to go anywhere else. We can create your website, market your station and help you submit your station to online directories. We also feature the voice of Derek Bullard aka Dibblebee He can create affordable commercials, DJ intros, sweepers, jingles, ids and so much more.

SHOUTcast icecast.org WinSonic Authorized Partner Centova Airtime cPanel RvSiteBuilder Softaculous

Youtube Live Streaming
David Childers

Video continues to dominate the world of online entertainment. The use of video on demand as well as the delivery of live content continues to increase from both small and large groups.

Youtube offers the ability to stream video / audio with Live stream ability with the only requirement being that your Youtube is in good standing (I.E. no copyright infringements). Youtube required a certain amount of channel followers to qualify for Live streaming ability until recently. Youtube offers the ability to Live stream your video/ audio with a comprehensive set of tools, a generous supply of bandwidth and the ability to include Adsense advertising with your stream.

One of the biggest problems for small groups, businesses or individuals is accessing the technology to make use of Youtube Live streaming. These problems are easily overcome with the knowledge and application of Open Source software.

Scenic Television is a station that uses niche content and available FREE technology and SOFTWARE to create a genuinely global station.

Scenic Television is an Internet television station that presents the sights and sounds of nature. The station originates from the Gulf coast of South Alabama and broadcasts to a global audience. The station continuously broadcasts 24 hours a day. The Internet video stream is accessible on any device with a high speed Internet connection. Scenic Television uses Creative Commons licensed video which allows the station to provide the content for free and not require a subscription fee.

Scenic Television uses the Youtube Live streaming content delivery network which also significantly reduces the cost for content distribution.

Scenic Television uses Open Source software which significantly reduces the production costs.

http://television.scenicradio.com

Preparing Youtube Live Streaming

What Do You Need

You must create or have an active Youtube account that is in **GOOD STANDING**.
(You must not have ANY copyright violations.)

https://support.google.com/youtube/

Live Streaming Guide

https://support.google.com/youtube/topic/2853712

There is no need to download or install a live encoder.

You can create a source stream that will consist of existing video files played as a random playlist to simulate a continuous video stream. This will be very similar to sourcing audio to a shoutcast server.

CAUTION

Youtube continuously monitors all video and audio content that is streamed.

You must ensure that any video or audio content that is streamed by you has been properly licensed or is covered by an existing license.

- The content has been licensed for your SPECIFIC use for Internet broadcasting.

- The content has been released or licensed within the Public Domain.

- The content has been licensed under Creative Commons.

ANY MULTIMEDIA USED MUST HAVE THE PROPER LICENSING.

Source Software

Source software allows you to use a dedicated computer to automatically create a video playlist and stream that playlist to Youtube for live streaming.

The streaming source software that will be used is FFmpeg, which is a complete, cross-platform software solution.

https://www.ffmpeg.org/

FFmpeg Cheat Sheet

http://lzone.de/cheat-sheet/ffmpeg

FFMPEG Help

https://ffmpeg.org/ffmpeg.html

FFmpeg static build software. No installation required, just unpack and run.

http://johnvansickle.com/ffmpeg/

https://evermeet.cx/ffmpeg/

https://www.npmjs.com/package/ffmpeg-static

It is important to verify that you have properly installed and configured FFmpeg to provide support for all necessary multimedia codecs and formats.

Command To List All Supported Formats	Command To List Supported Codecs
$ ffmpeg -formats	$ ffmpeg -codecs

NOTE:

If you choose to use static built FFmpeg software packages, a copy of the FFmpeg software package must be placed in **EACH** folder where a process will be initiated for streaming.

The FFmpeg software package file must be appended with a . (period) to make the file “invisible”. The file will still be executable. However, it will not be detected by the random file generation function.

Example : **.**ffmpeg

You must append the Bash Shell Script to include the period in front of the FFmpeg command.

Example : **.**ffmpeg

Multimedia Encoding

The input multimedia **MUST** conform to the Youtube multimedia stream requirements.

You can find Google information on Youtube multimedia requirements here:

https://support.google.com/youtube/answer/2853702?hl=en

Verify Encoding

You can use the FFmpeg module “ FFProbe “ to verify that the multimedia has been properly encoded and formatted.

FFprobe Command

$ ffprobe file_name.extension

Here is a guide for understanding and using FFprobe.

http://www.oodlestechnologies.com/blogs/Extracting-video-information-of-a-video-file-using-ffmpeg

Keyframe Interval Rate

When multimedia is encoded to use for streaming with Youtube Live, It is very important to pay special attention to the video **Keyframe Interval Rate**. Using a Keyframe Interval Rate that is too high will render the video poorly.

If you are using existing multimedia files, you can remaster multimedia with FFmpeg to use the correct **Keyframe Interval Rate.**

For additional information on Keyframe Interval Rate see the section - **Fun With FFmpeg**.

Source Stream Hosting

It is highly suggested that a dedicated computer system is used to host the source streaming.

Minimum system requirements include:

- 750 Gigbabytes monthly bandwidth.
  (Depending on quality of encoding speed used.)

- Minimum dual core CPU.

- Minimum 4 Gigabytes system RAM.

- Minimum 500 Gigabytes hard drive.
  (Depending on total videos in playlist.)

- It is highly suggested that routine hard drive back up service is available.

The Stream Sourcing Process

A script was created to use FFmpeg and basic Linux commands to create a random video playlist and source that playlist to Youtube for streaming. The script DOES NOT re-encode - it does a "codec" to "codec" copy and formats the video into FLV. Continuous real time multimedia encoding eats up computer resources like candy. A computer system could easily be maxed out at 100% system resources doing so. Codec to codec copy is extremely lite on system resources; thus, you only use between 3 and 4 % systems resources.

How This Is Achieved

Video files are grouped together in different folders.

Example : /Space Movies /Cowboy Movies /Announcements /Advertisements

The bash shell script will start the stream process in the sequential order indicated in the script itself.

The script will use the shuffle command in each video folder and randomly select a video file to be streamed. The file will then be inserted into the bash shell script and streamed using FFmpeg.

After the current video has been streamed, the batch file will proceed to the next portion of the script.

NOTE:

You must use the relative file directory location in the batch shell script.

Example : **/home/saint/stream/multimedia/folder02**

Running Bash Shell Scripts When Logging Out

When you log out of a server shell, all processes running via bash shell process (I.E. scripts) will terminate. To overcome this, you use the NOHUP command. Run the streaming script in conjunction with the NOHUP command.

The textual output of the streaming script is piped to the nohup.out text file. At the end of the streaming script you will note that the nohup.out text file is truncated - this deletes the contents of the file so that

the nohup.out file does not continue to grow and consume valuable hard drive space.

The nohup.out output file can be viewed and checked for any irregularities that may occur during the streaming process.

For additional information on nohup, you can read the nohup man page.

http://man.cx/nohup

The end of the Bash Shell Script performs several tasks.

- It changes location to the folder containing the stream bash shell.

- It truncates (erases) the content of the nohup.out output file.

- It restarts the stream bash file script.

```
 cd /home/saint/stream

truncate -s 0 nohup.out

./stream.sh
```

Truncate removes all data from a specified file. For additional information on truncate, you can read the truncate man page.

http://man.cx/truncate

General Notes About The FFmpeg Bash Shell Script Command

This is the FFmpeg Youtube source script. You must configure the destination youtube server information.

- -

```
ffmpeg -re -i $(ls | shuf -n 1) -vcodec copy -acodec copy -flags global_header -f flv
"rtmp://a.rtmp.youtube.com/live2/Stream name-key"
```

- -

- re Reads the input file at native frame rate. Used to simulate a multimedia grab device.

- I Directs FFmpeg where to pull the input multimedia content from.

$(ls | shuf -n 1) This command performs the following functions:

- Lists all files in the current directory

- Shuffles the files in that directory

- Selects one of those files.

- Places the selected file within the script $( ) to be processed by FFmpeg

-acodec copy -vcodec copy Directs FFmpeg to copy the input file without transcoding.

-f flv Package the stream into a FLV container.

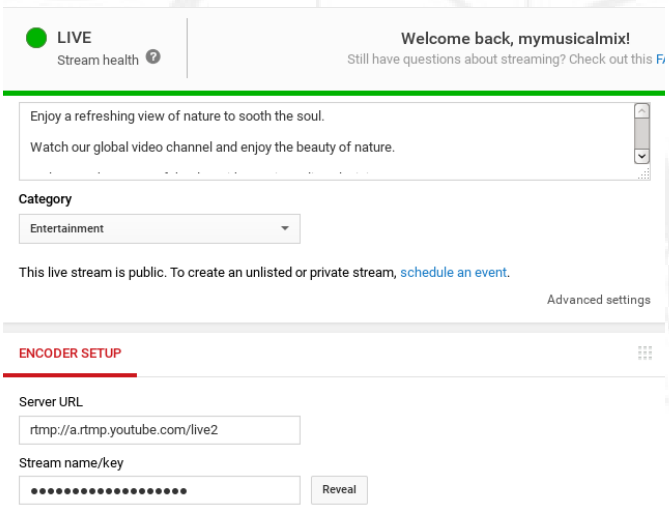
-flags global_header You must force the use of global headers in the stream process or you will get a error from FFmpeg.

[flv @ 0x487c620] Codec for stream 0 does not use global headers but container format requires global headers
[flv @ 0x487c620] Codec for stream 1 does not use global headers but container format requires global headers

Server URL And Stream Key

This information is found on the Live Dashboard page under **Encoder Setup**.

https://www.youtube.com/live_dashboard



< - Server URL
< - Stream Name Key

- -

http://www.xltrax.com/

FFmpeg Streaming Bash Shell File

Launch Stream Bash Script With This Command

$ nohup ./stream.sh &

Bash Shell Command File

(Name of file: stream.sh)

- -

#!/bin/bash

Announcement One

cd /home/saint/stream/multimedia/folder01

ffmpeg -re -i $(ls | shuf -n 1) -vcodec copy -acodec copy -flags global_header -f flv "rtmp://a.rtmp.youtube.com/live2/**Stream name-key**"

Video One

cd /home/saint/stream/multimedia/folder02

ffmpeg -re -i $(ls | shuf -n 1) -vcodec copy -acodec copy -flags global_header -f flv "rtmp://a.rtmp.youtube.com/live2/**Stream name-key**"
Announcement Two

cd /home/saint/stream/multimedia/folder03

ffmpeg -re -i $(ls | shuf -n 1) -vcodec copy -acodec copy -flags global_header -f flv "rtmp://a.rtmp.youtube.com/live2/**Stream name-key**"

Video Two

cd /home/saint/stream/multimedia/folder02

ffmpeg -re -i $(ls | shuf -n 1) -vcodec copy -acodec copy -flags global_header -f flv "rtmp://a.rtmp.youtube.com/live2/**Stream name-key**"

cd /home/saint/stream

truncate -s 0 nohup.out

./stream.sh

- -

When you upload the stream.sh file to the server, you must make the file executable.

Use the chmod command: chmod +x filename.extension   (chmod +x stream.sh)

REMEMBER:

You must use the relative file directory location in the batch shell script.

Example : /home/saint/stream/multimedia/folder02

If you choose to use static built FFmpeg software packages, a copy of the FFmpeg software package must be placed in EACH folder where a process will be initiated for streaming.

The FFmpeg software package file must be appended with a . to make the file “invisible”

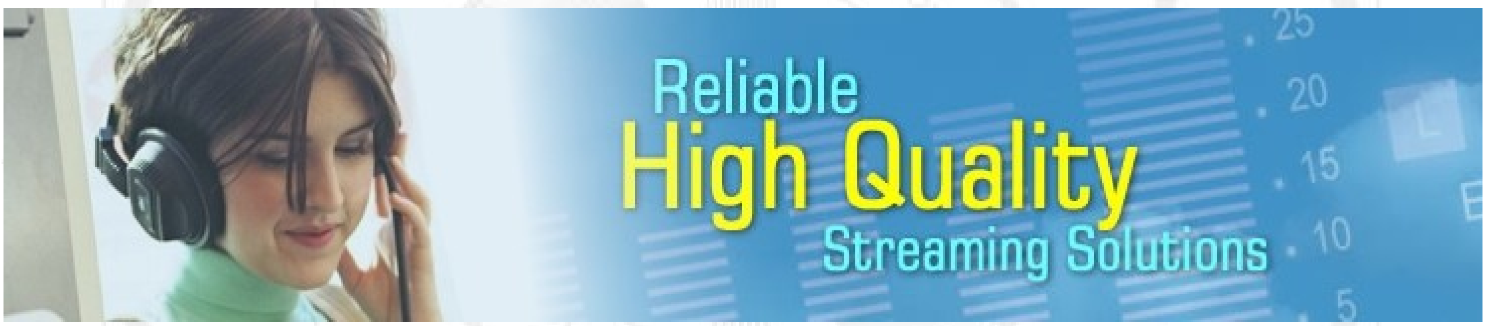
Example : .ffmpeg

The file will be executable – however it will not be detected by the random file generation function.

You must append the Bash Shell Script to include the period in front of the FFmpeg command.

Example : .ffmpeg

- -



Shoutcast Streaming has the resources and technology to help you launch your Youtube Live streaming station.

We offer both dual and quad core dedicated servers that can your favorite Linux distribution installed.

Our hosting solutions provide premium Tier 1 bandwidth with exceptional server equipment performance.

https://www.shoutcaststreaming.us/dedicated.htm

- -

Using FFmpeg For Other Tasks

Remaster Keyframe Rate With FFMpeg

Youtube Live Encoder requires the input video to have a **Keyframe Interval Rate** below 4 to ensure proper video stream processing.

You can remaster existing video files to ensure that they have a proper **Keyframe Interval Rate**.

-g Keyframe interval (also known as GOP length)

-r Frame rate

Command

- -

$ ffmpeg -i **test.mp4** -c:a copy -s 1280x720 -filter:v yadif -vcodec libx264 -pix_fmt yuv420p -g 30 -r 30 **remastered.test.mp4**

- -

Name of input video file - **test.mp4**

Name of output video file - **remastered.test.mp4**

Remove Specific Section Of Video With FFmpeg

You can edit portions of a video file to remove specific sections of that video.

Command

- -

$ ffmpeg -ss **00:00:01** -t **00:00:15** -i "**video1.avi**" -acodec copy -vcodec copy "**edited-video1.avi**"

- -

video1.avi - Name of video file to be edited.

00:00:01 - The first time listed is the START point of what portion of the video that you want saved. (Time is entered in - **Hours** : **Minutes** : **Seconds**.)

00:00:15 - The second time listed is the END point of what portion of the video that you want saved. (Time is entered in - **Hours** : **Minutes** : **Seconds**.)

edited-video1.avi - Name of edited video file.

The video editing is processed using lossless data reconstruction and is achieved in a very short time.

Video Fade Out Script

This is a Bash script that fades out the end of videos (audio + video) automatically.

Bash Shell Command File

(Name Of Script – FadeOutMp4.sh)

Command

./FadeOutMp4.sh <**input mp4**> <**output mp4a**>

- -

```
#!/bin/bash

# Audio + vidéo fade out at the end of mp4 files

# 2015-09-09 19:07:17.0 +0200 / Gilles Quenot

# length of the fade out
fade_duration=2 # seconds

if [[ ! $2 ]]; then
    cat<<EOF
Usage:
    ${0##*/} <input mp4> <output mp4>
EOF
    exit 1
fi

for x in bc awk ffprobe ffmpeg; do
    if ! type &>/dev/null $x; then
        echo >&2 "$x should be installed"
        ((err++))
    fi
done

((err > 0)) && exit 1

duration=$(ffprobe -select_streams v -show_streams "$1" 2>/dev/null |
    awk -F= '$1 == "duration"{print $2}')
final_cut=$(bc -l <<< "$duration - $fade_duration")
ffmpeg -i "$1" \
    -filter:v "fade=out:st=$final_cut:d=$fade_duration" \
    -af "afade=t=out:st=$final_cut:d=$fade_duration" \
    -c:v libx264 -crf 22 -preset veryfast -strict -2 "$2"
```

- -

Insert Graphic Into Video At A Specified Time With FFmpeg

This script inserts a graphic image within a video file. The time of insertion and position of the image is stipulated within the script.

Command

- -

```
ffmpeg -i My.Videomp4 -i test.png -filter_complex \
"[0:v][1:v] overlay=10:10:enable='between(t,00,14)'" test.mp4
```

- -

My.Video.mp4

Video name and format of video that image will be inserted into.

test.png

Image file name and format of image to be inserted into video.

Overlay=10:10

Pixel location of image.
- First number is vertical position.
- Second number is horizontal position.
  (Position originates from the top left corner.)

between(t,00,14)

Start and stop time for image display.
(Time in seconds.)

test.mp4

Output name and format of video.

Time Conversion For Seconds

1 minute = 60 seconds

1 hour = 3600 seconds
(60 minutes x 60 seconds.)

Example of graphic insertion command.

Youtube Live Streaming Extras

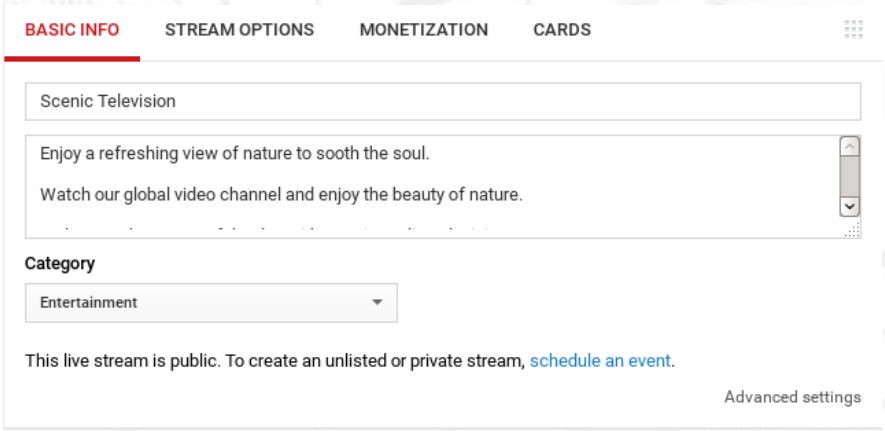
Station Information

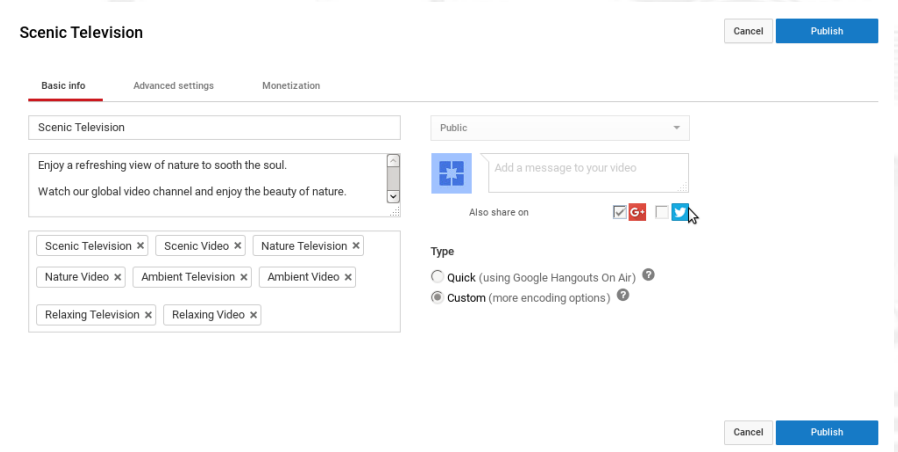
Enter in the following information about the station.

- Station name.

- Description of station.

- Category you want the station to be listed in.

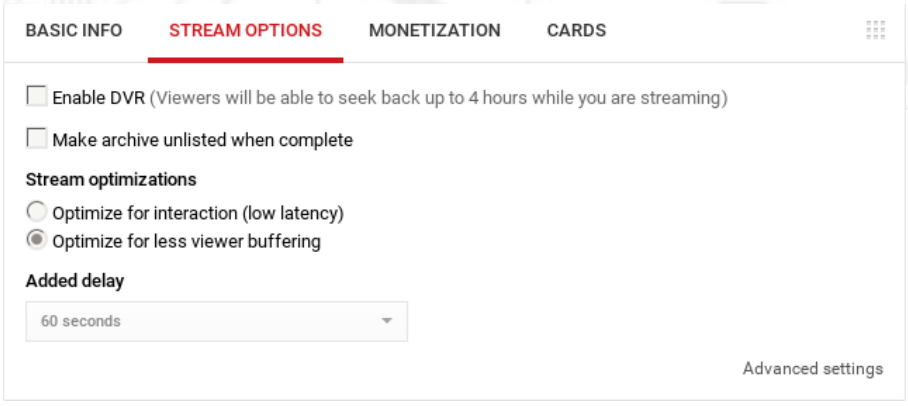




- Advanced Options

  Adding meta tags for broadcast under Basic Info.

Stream Options



- Do not select “ Enable DVR “ option as the broadcast is continuous.

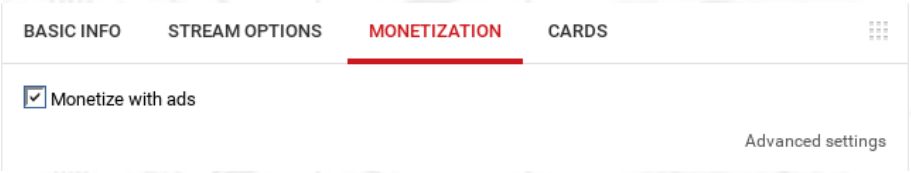
- Check - Optimize for less viewer buffering.

- Select - Added delay of 60 seconds.

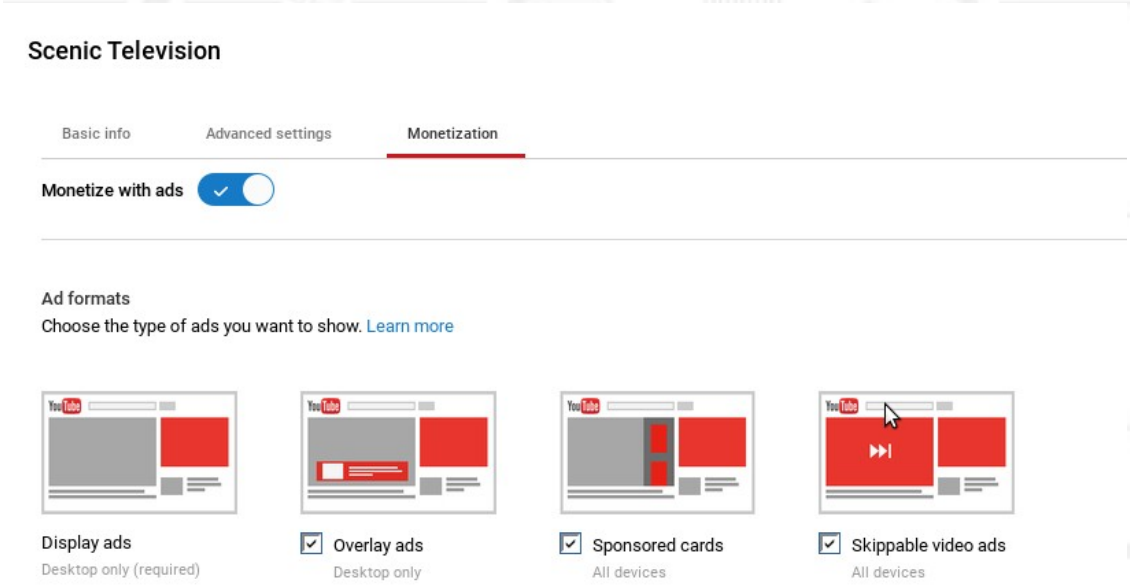
Video Monetization

Display Google Adsense advertising within the Youtube Live Stream.

(You must have an existing Google Adsense advertising account.)



Select type of Google Adsense advertising to be displayed within Youtube Live Stream.

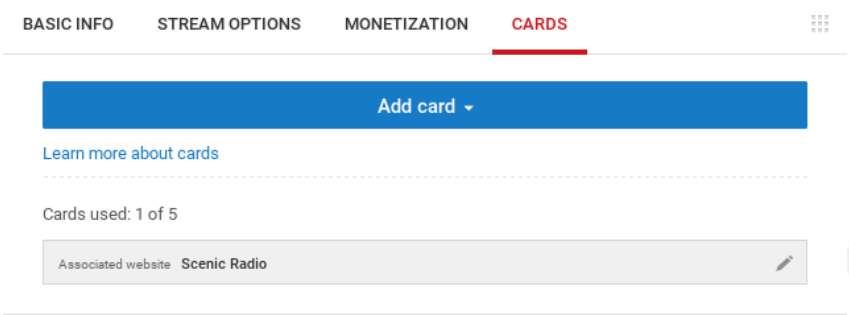


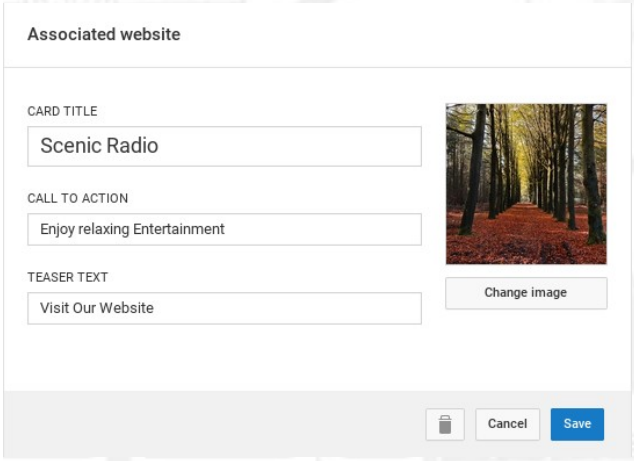
Station Card

A station card displays information within the Youtube video screen when it is clicked on.

← The station card appears in the upper
← right corner of the video screen.
← This card will contain an image, web
← URL link and text.

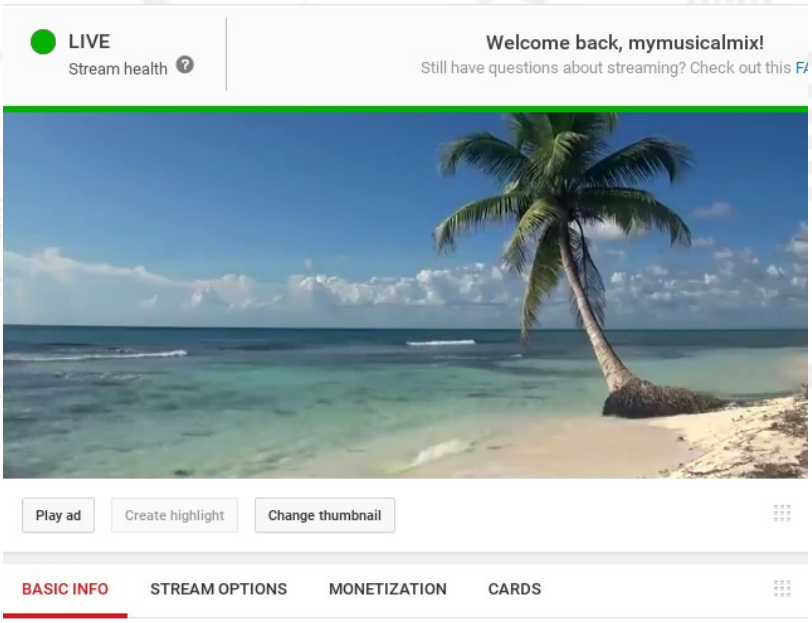
Creating / Editing The Station Card





Live Stream Thumbnail

A thumbnail will appear when the stream live video is not being played. The thumbnail image can be changed using the " Change thumbnail " option.



Use the Change thumbnail button at the bottom center of the video to change the stream thumbnail.

(Live Stream Dashboard)

Live Station Embedding Script

You can embed an HTML code on any website to display the Youtube Live video channel.

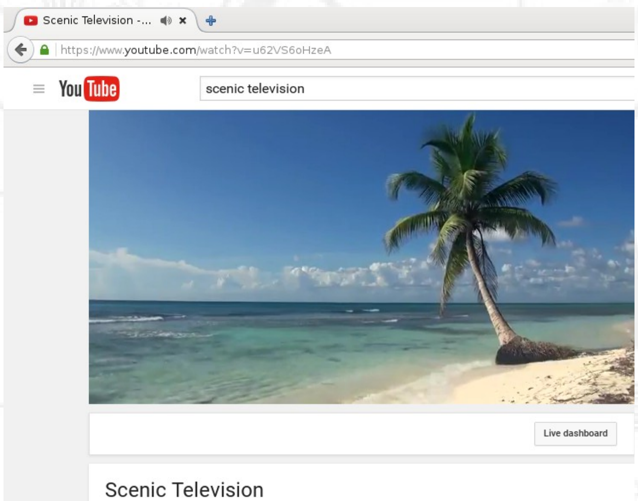
HTML Code

<iframe allowfullscreen="" class="youtube-player" frameborder="0" height="**480**" src="http://www.youtube.com/embed/**u62VS6oHzeA**" title="YouTube video player" type="text/html" width="770"></iframe>

length of video displayed - in Pixels.

Width of video displayed – Pixels.

URL of Youtube source video.
This is obtained from the Youtube video page.



Example Youtube live stream web address.

https://www.youtube.com/watch?v=**u62VS6oHzeA**

Tune in to Canada's Dibblebee show featuring great dance, club and electronic music. Most of the songs mixed are from hot independent artists. Every week enjoy a featured artist interview, a bonus track and the jump start of the week. Not only will you get to know new artists that play great music we will give you some encouraging advice to gain more success in your life!

Linux Commands

Command Line Quick Reference

Display all running processes

$ top

Display current status of server

$ top -d2

Display system resources and activity

$ vmstat

Display status of all memory

$ free -m

Display status information about hard drive

$ df -h

Make file executable

$ chmod +x [file.extension]

Display contents of file

$ cat [file.extension]

Terminate a process or application

$ kill [PID number]

Quit SSH Login

$ exit

SSH Login Bash Shell Script

Bash Shell Command File

Name Of Script - vps.login.sh

- -

```
#!/bin/sh

ssh USER@123.456.789.123
```

- -

USER - User name of account with ROOT privileges.

123.456.789.123 – IP Address of computer host.

For additional information on SSH, you can read the SSH man page.

http://man.cx/ssh(1)

Secure File Copy With Data Compression

Command

- -

$ scp -Cpv [file name + file extension] USER@123.456.789.123:[/some/remote/directory/]

- -

The "**-C**" parameter will compress files on the go. The compression only happens in the network. This will make file transfers faster.

The "**-p**" parameter will display an estimated transfer time and the connection speed.

The "**-v**" parameter will display debug information. It can help you debugging connection, authentication and configuration problems.

USER - User name of account with ROOT priviledges.

123.456.789.123 – IP Address of computer host.

/some/remote/directory/ - Relative remote directory where the file will be transferred to.

For additional information on nohup, you can read the nohup man page.

http://man.cx/scp(1)

Additional Information About Linux Commands

The Linux Command Line
A Book By William Shotts

Designed for the new command line user, this 537-page volume covers the same material as LinuxCommand.org but in much greater detail. In addition to the basics of command line use and shell scripting, The Linux Command Line includes chapters on many common programs used on the command line, as well as more advanced topics.

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You can download the book from the Linux Command website.

http://linuxcommand.org/tlcl.php