The good and bad about Streaming media

How streaming media can be stolen and how to protect it.

Who are you?

- tommEE pickles
- Crazy clown from NYC
- Lives in LA
- Single
- Arrested, Jailed…
- Media Whored…
- Likes to drink

Qualifications

- Over 12 years of commercial computer experience
- Worked on Computer Radar Controlled Weapon Systems
- Developed streaming media solutions for Digital Club Network
- Runs media website Moloch.TV
- Always encoding TiVo Videos and storing them on a file server.

What the hell is Streaming Media?

- Streaming Media is multimedia content transported though protocol like http, pnm, rtsp, or mms
- Common types of Streaming Media are
  - Real Networks (aka Real One)
  - Shoutcast, Icecast (aka MP3 streaming)
  - Microsoft Windows Media (aka most proprietary)

Media Players...

Quick and dirty intro to the different clients.

- Real Player
- Windows Media Player
- Quicktime
- Winamp,
- etc…

Real Player

- Plays lots of file formats
- Multi platform
  - Windows
  - Unix
  - Mac
  - Linux
- SureStream Technology
- Full Screen
- MPEG4 with Envivo Plug-in

But…

Real Player

- Plus Version costs money
- Player has not been updated on Unix
  - Update: codec has been updated
- Sole purpose seems to be commerce

Windows Media

- Multiple media formats: asf, wmv, avi, mpeg, mp3
- Included with Windows
- Skin-able
- Full Screen
- Large Demographic
- Wine will support Media Player 6.4

But…

Windows Media

- DRM (Digital Rights Management)
- No constancy between player versions.
- Makes use of shared libraries for codec

Quicktime Player

- Supports MPEG4
- Can edit files
- Supports Windows and Mac

But…

Quicktime

- Not supported by Unix without wine
  - Plugger is an exception
- Full screen only used in Paid Versions
- Editing only used in Paid Version

The servers…

Brief introduction into the various servers that have ability to stream

- Real Server
- Windows Media Server
- Darwin
- Shoutcast, Icecast

Real Server

- It’s free… (to an extent)
- It’s multi platform, runs from cmd line
- It’s widely used

But…

- It’s costly and can be exploited

Quicktime Server

- Free Server

But…

- Not as easy to serve stuff
- Has been exploited in the past

Microsoft Media Server

- Free… with Microsoft Windows 2000 Advanced Server

But…

- Many exploits
- Poor logging

Shoutcast, IceCast

- MP3 streaming
- Free servers
- Runs on Linux

But…

It has been exploited in the past.

Lets start simple

The easiest ways of serving and how to steal...

Lets let people download

One way people can serve today is just by the upload-and-serve method.

- Make a file. Real, Windows, MP3, QT, etc.
- Upload it to your site. SCP, FTP, etc.
- Create a link on your page.

Ok, you can probably see how to grab the media here but you can control the downloading by htaccess or JavaScript.

Ok, lets stream it, cheap

For every file there is another way to make it look like streaming with a batch file type of text file.

(e.g. ram > rm, or asx > asf or m3u > mp3)

Two reasons for this…

- To make the file stream instead of save as.
- Security though obscurity

Getting around the html

- wget or lynx –dump
- right click and save as.
  - Either way, get the file local. You can then look at the ram or asx, etc. in a text editor and figure where to go from there.
  - If it is a http:// inside the text file, just wget or lynx –dump the location. If you are on windows, make a html file with right click here and right click and save.

Siphoning the html

For even the easiest streaming theft you have to look through the html code.

- View source or view page source and search for media types. (e.g. rm,ram,mpg, mp3, wav, avi, mov)
- If right clicks and the menus don’t work. Don’t forget the windows keys.

Sniffing

- Sniffing is another way of finding the URLs that the javascript or SQL is hiding.
- Advanced ways can include tcpdump or windump

Media from media servers

- Some people/companies have figured out the best and most secure way of serving data is with media servers.
- There are ways around this also

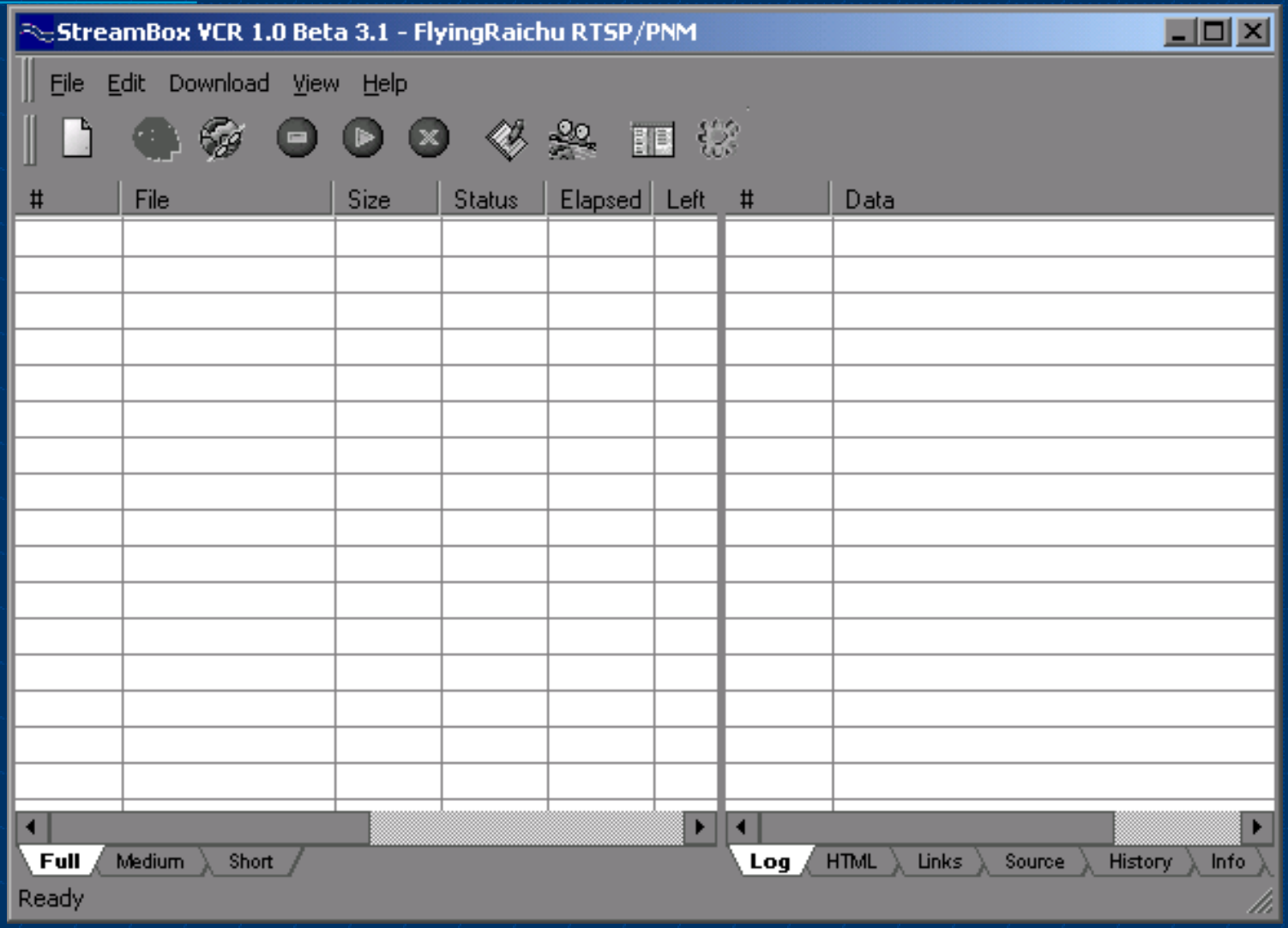
A word about realmedia logs

- Real server logs are best on Linux
- They only log on disconnect
  - It's a TCP connection, then it will stream UDP
  - Real will log when player disconnect from the server. (info like ip, player version, time media was played and what speed)
  - Most times the media will be served over UPD and the TCP session will control the SureStream speed.

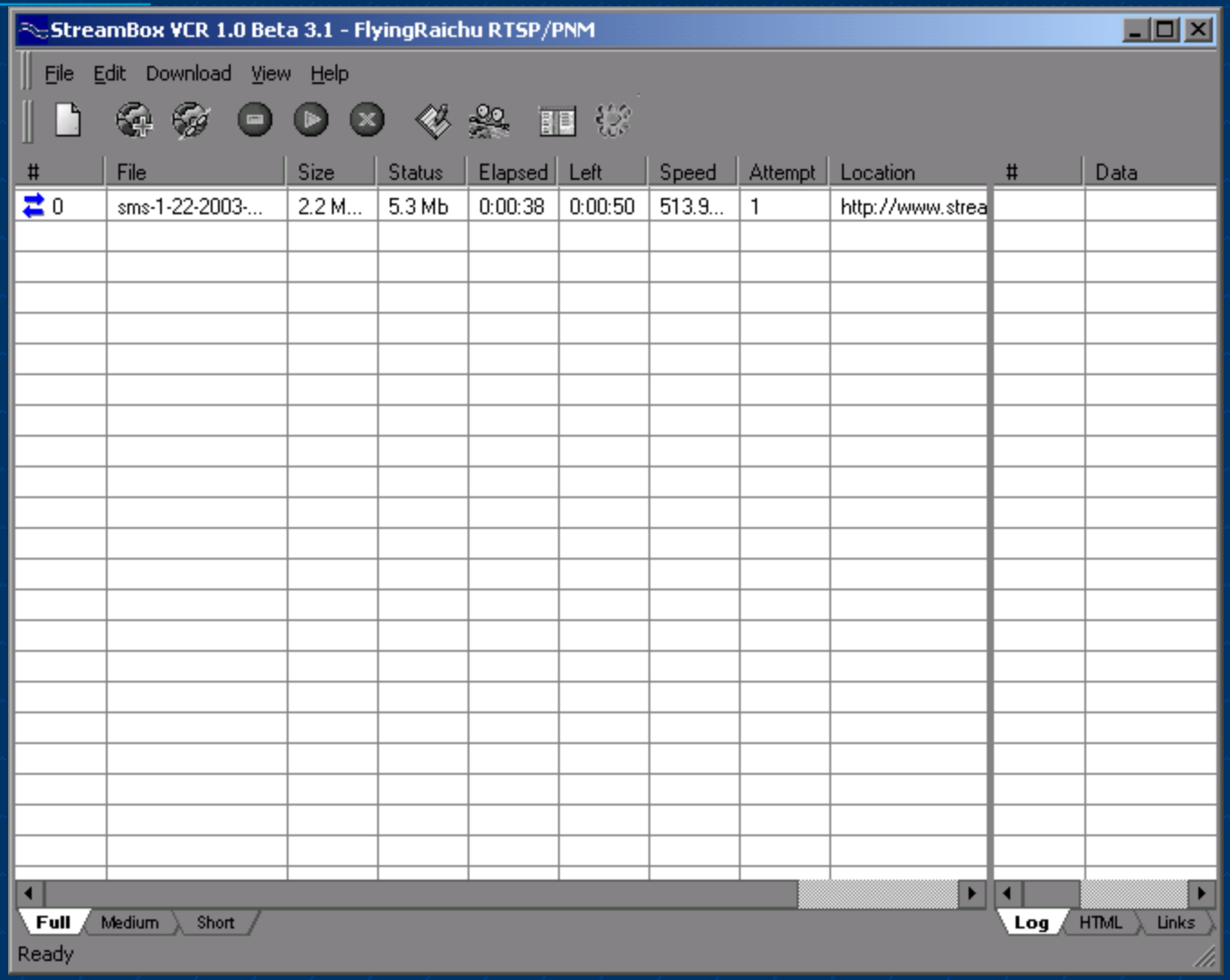
Streambox VCR

- Preceded by Streambox Ripper. An enemy of Real Networks.
  - 10/2000 Streambox settled with Real Networks a dispute where to supposedly protect private content of Real Media publishers by no longer allowing Streambox to sell its utility Streambox Ripper which actually converts real media files to wav format.
- Still can be found on the net and updated for Real 9 Helix
- Basically it fakes a real player connection, that's all.

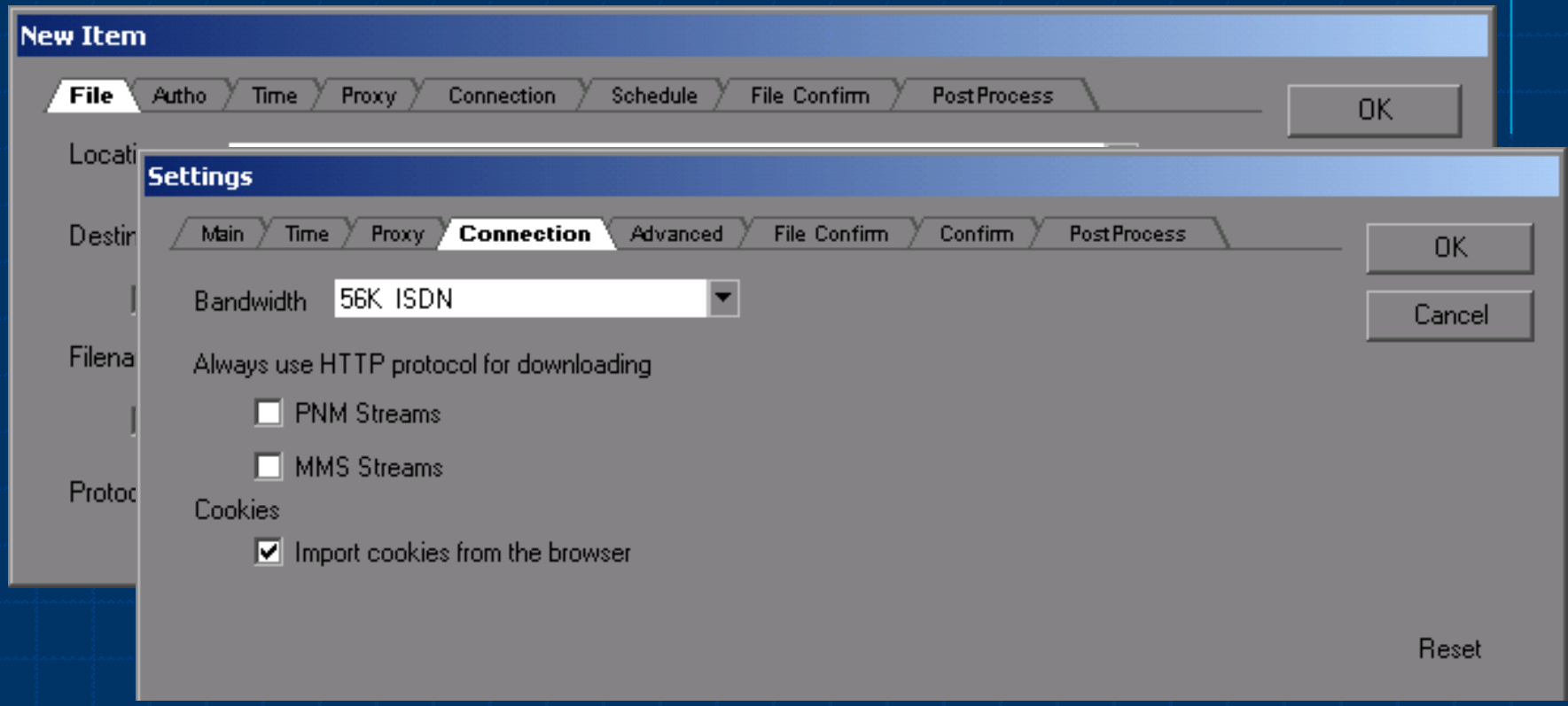
Streambox VCR



Streambox VCR



Streambox VCR



Lets try to fight this…

How?

It's possible but there are problems.

- Real doesn't log until disconnect
  - So you have to watch for the first file…
- So if they use Streambox is there ways to hide the files from it?
  - Yes, with J2EE or tomcat along with sql. Very effective.
- What about the signature of Streambox?
  - Its possible to stop illegal players connecting in the real server configuration.

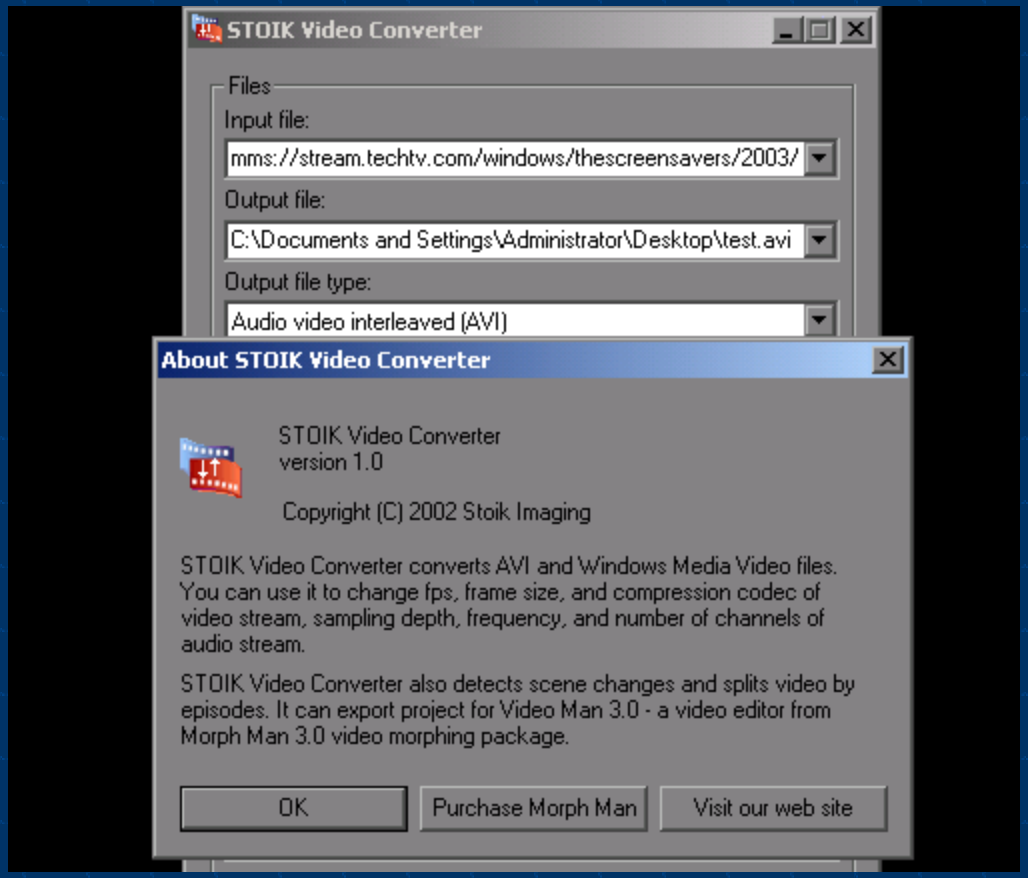
Leeching Windows Media

Windows makes internet fun by integrating the desktop with the browser</sarcasm>

- You can use mms:// in most applications
- mms is the Microsoft media server protocol.
- Windows Media Server comes with Windows 2000 Advanced Server.
- Doesn't log well at all
  - After all, it's Windows

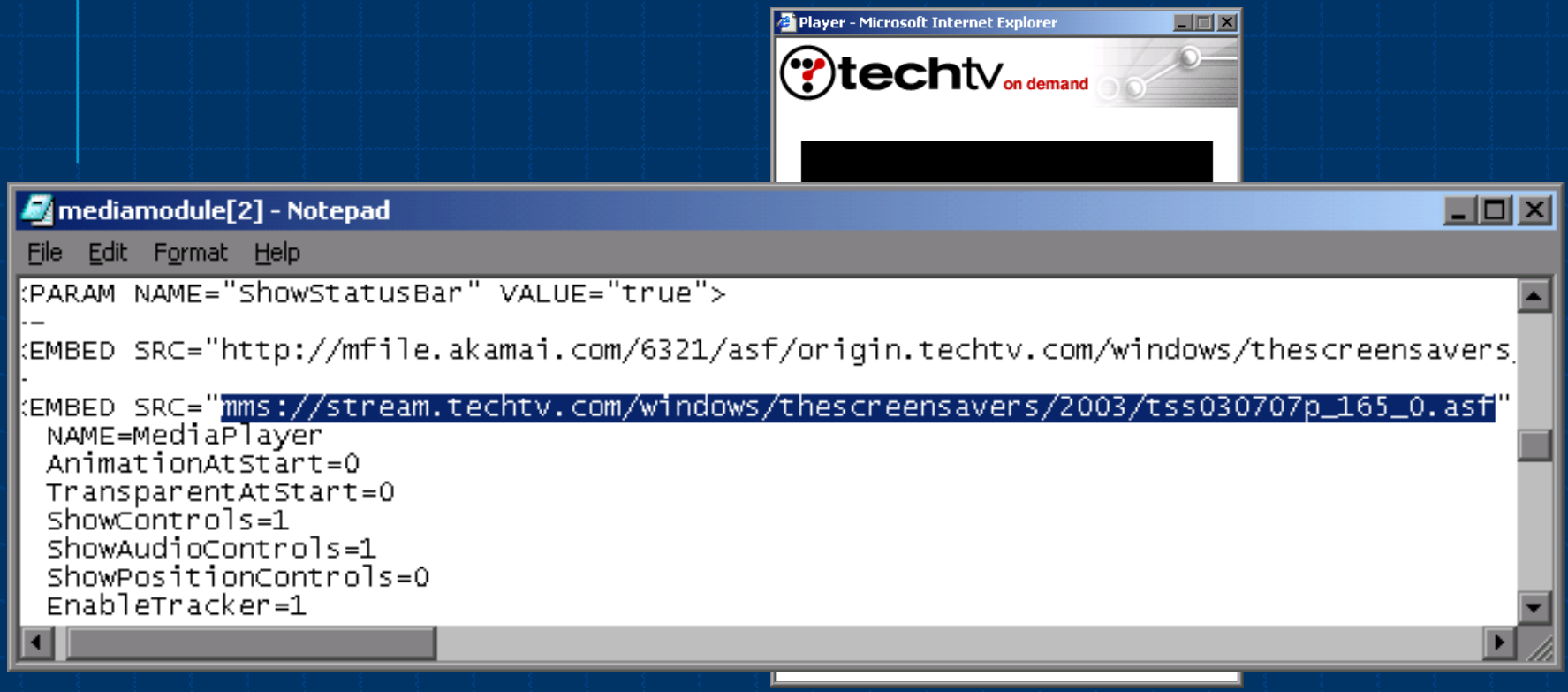
STOIK Video Converter

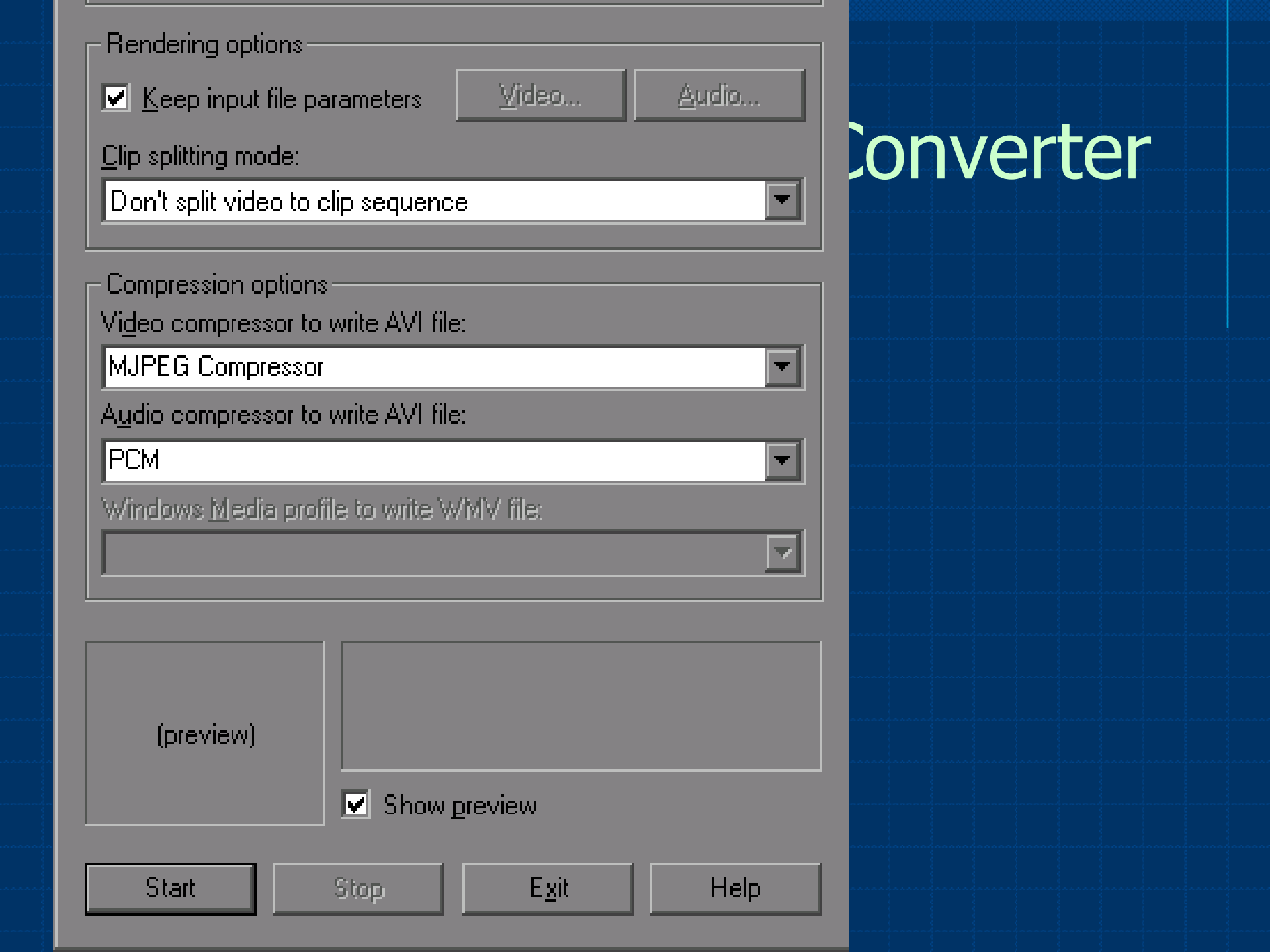
This is one program that converts asf to wmv or avi. I experimented it with mms://



STOIK Video Converter

Basically you have to find the source by siphoning the html and then usually wget the asx file. cat/notepad/more the file to get the mms:// url.

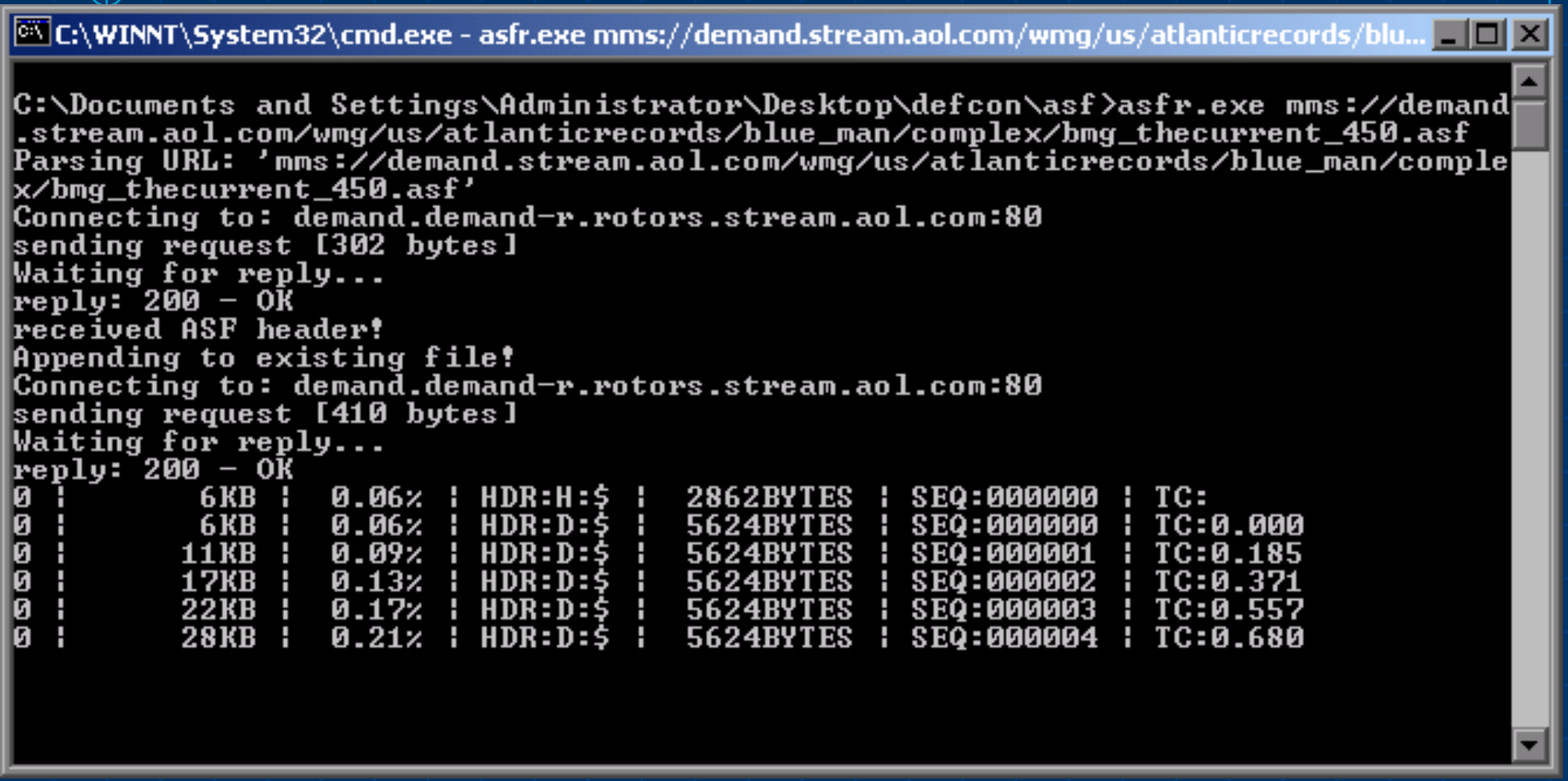



Converter
Rendering options
Keep input file parameters
Video...
Audio...
Clip splitting mode:
Don't split video to clip sequence
Compression options
Video compressor to write AVI file:
MJPEG Compressor
Audio compressor to write AVI file:
PCM
Windows Media profile to write WMV file:
(preview)
Show preview
Start
Stop
Exit
Help

ASFR+

- ASFR+ is the successor of asfrecorder
- Support HTTP and MMS(TCP) protocol.
- Download multiple parts simultaneously for a huge speed up.
- Fixing data while downloading.
- Auto retry & resume if connection's broken.
- Support CJK characters in URL

ASFR+


C:\WINNT\System32\cmd.exe - asfr.exe mms://demand.stream.aol.com/wmg/us/atlanticrecords/blu...
C:\Documents and Settings\Administrator\Desktop\defcon\asf>asfr.exe mms://demand
.stream.aol.com/wmg/us/atlanticrecords/blue_man/complex/bmg_thecurrent_450.asf
Parsing URL: 'mms://demand.stream.aol.com/wmg/us/atlanticrecords/blue_man/comple
x/bmg_thecurrent_450.asf'
Connecting to: demand.demand-r.rotors.stream.aol.com:80
sending request [302 bytes]
Waiting for reply...
reply: 200 - OK
received ASF header!
Appending to existing file!
Connecting to: demand.demand-r.rotors.stream.aol.com:80
sending request [410 bytes]
Waiting for reply...
reply: 200 - OK
0 | 6KB | 0.06% | HDR:H:$ | 2862BYTES | SEQ:000000 | TC:
0 | 6KB | 0.06% | HDR:D:$ | 5624BYTES | SEQ:000000 | TC:0.000
0 | 11KB | 0.09% | HDR:D:$ | 5624BYTES | SEQ:000001 | TC:0.185
0 | 17KB | 0.13% | HDR:D:$ | 5624BYTES | SEQ:000002 | TC:0.371
0 | 22KB | 0.17% | HDR:D:$ | 5624BYTES | SEQ:000003 | TC:0.557
0 | 28KB | 0.21% | HDR:D:$ | 5624BYTES | SEQ:000004 | TC:0.680

ADD SERVER | REMOVE SERVER | REFRESH SERVER

MOLOCHTEST

Start Here
Configure Server
Unicast Publishing Points
Multicast Stations
Multicast File Transfers
Server Properties
Monitor Server
Publishing Point Events
Publishing Point Clients
Station Events
Station Connections
Station Streams
Help
Product Documentation
Technical Support

Connected to MOLOCHTEST

Monitor Server - Station Streams

Quick Info

The Manage Streams page displays a list of all streams currently created on the server. To terminate a stream, click to select it, and then click terminate selection. Double-click a stream to view its details.

Currently monitoring 0 stream(s).

Station Streams

Last update: 12:40:52 AM

Refresh | Select All | Terminate Selection

Stream ID	Station	State	Stream Source

Auto-refresh every 30 seconds

Updating in 5 seconds

Recent stream open/close events (updated automatically) Clear

My Computer

Clearly it must, right?

Event type	Message
Station	New station added. Station name is *station name*.
Station	Station has been deleted. The station name was *station name* and the description was *station description*.
Station	Station property changed. Station name is *station name*.
Stream	Stream from source *stream alias* or *stream URL* on station *station name* activated.
Stream	Stream from source *stream alias or stream URL* on station *station name* deactivated.
Stream	New stream opened. Stream source is *stream alias or stream URL*.
Stream	Stream closed. The stream source was *stream alias or stream URL* and the description was *stream description*.
Stream	Stream has started. Stream source is *stream alias or stream URL*.
Stream	Stream has stopped. Stream source is *stream alias or stream URL*.
Stream	Stream property changed. Stream source is *stream alias or stream URL*.
Stream	Stream archive closed.
Client	Client connected. The client address/port is *IP Address/Port*.
Client	Client disconnected. The client address/port is *IP Address/Port*.

How to Grab the MP3s

- If MP3 files are on a website, you can just right click, and save as.
- If .m3u files are on a website, you can save or wget the file and find the links.
- If it is then Shoutcast (IceCast), one way is Winamp…

Winamp

- Winamp is a graphical MP3 player
- Available in Versions 2 and 3

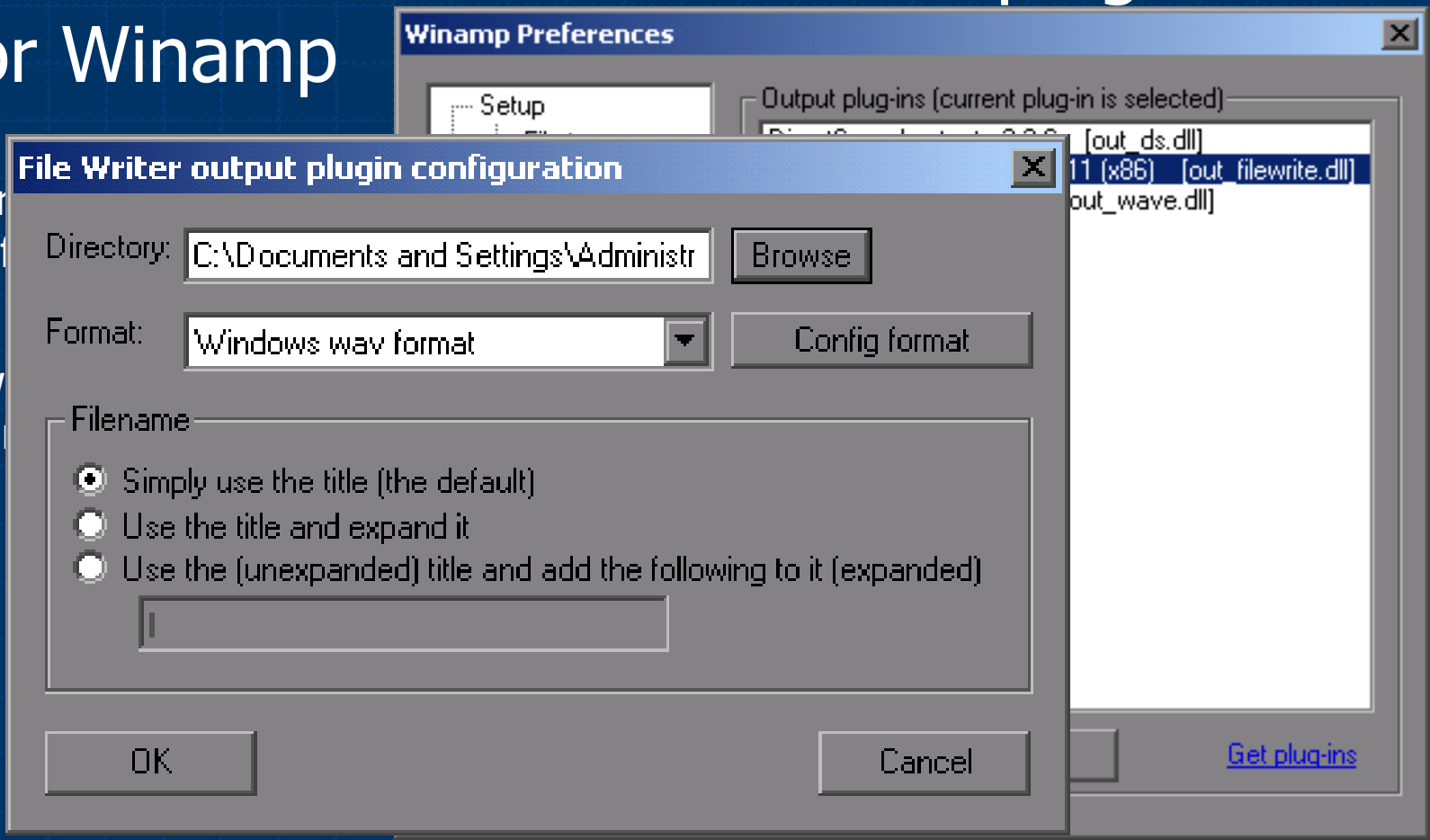
Winamp 2 below

Disk Writer and File Writer

- Disk Writer and File Writer are plugins for Winamp

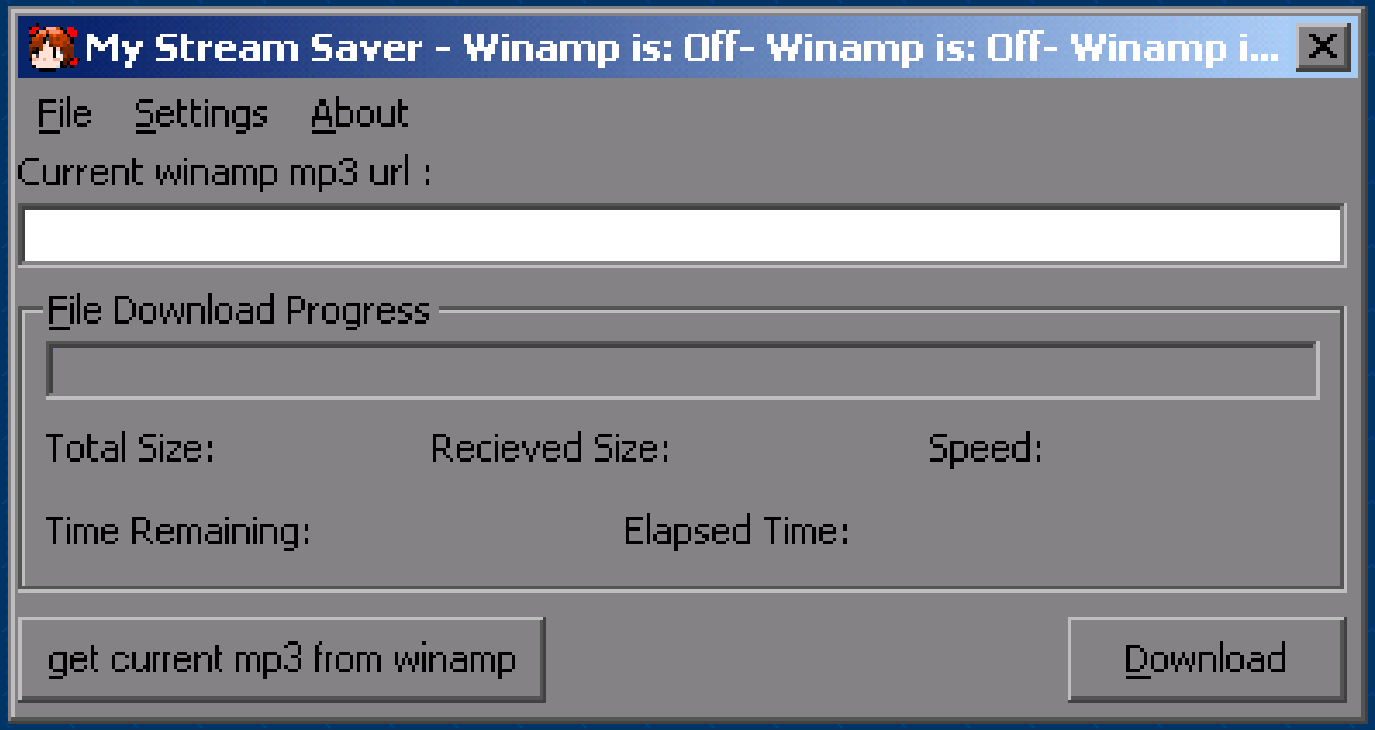
File Wr
faster f

This is
bandw
bufferi



My Stream Saver

- Really Simple
- Just like File Writer in a way.



Bad News

Winamp corrected the Disc Writing Steal

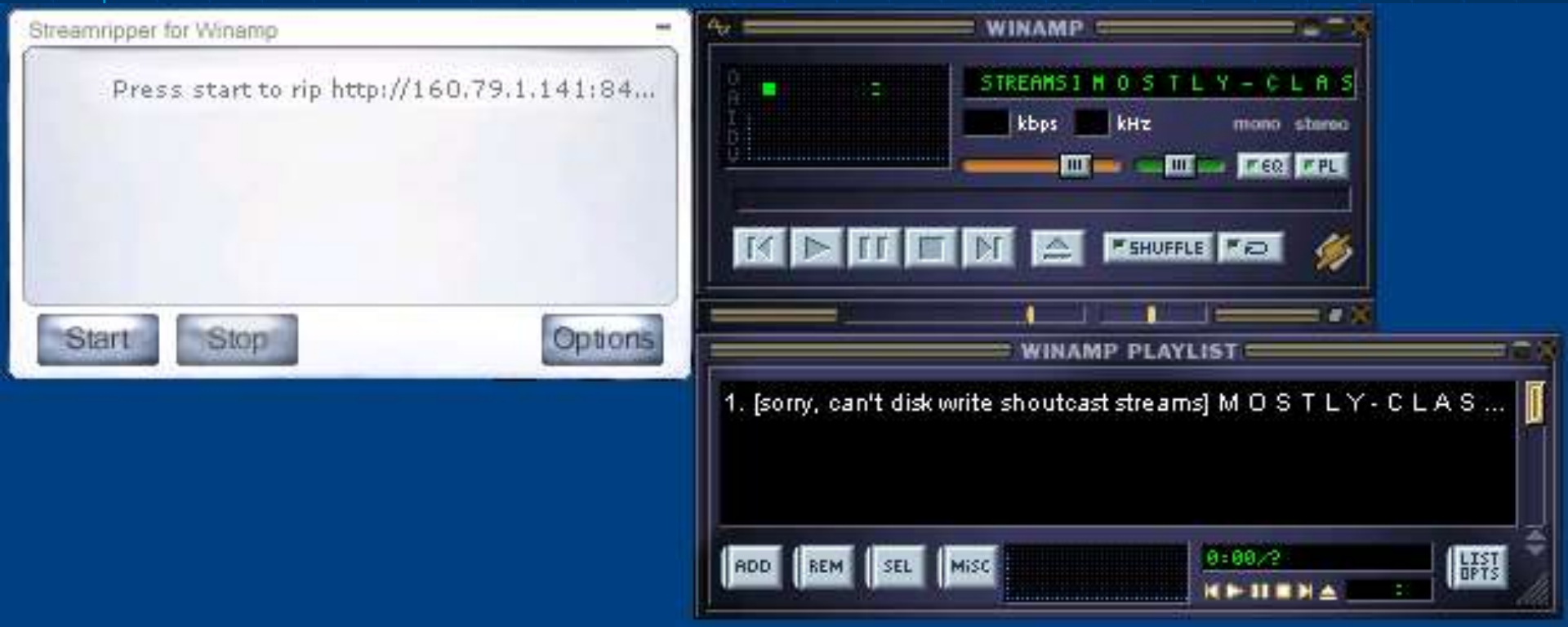
But…

Good News

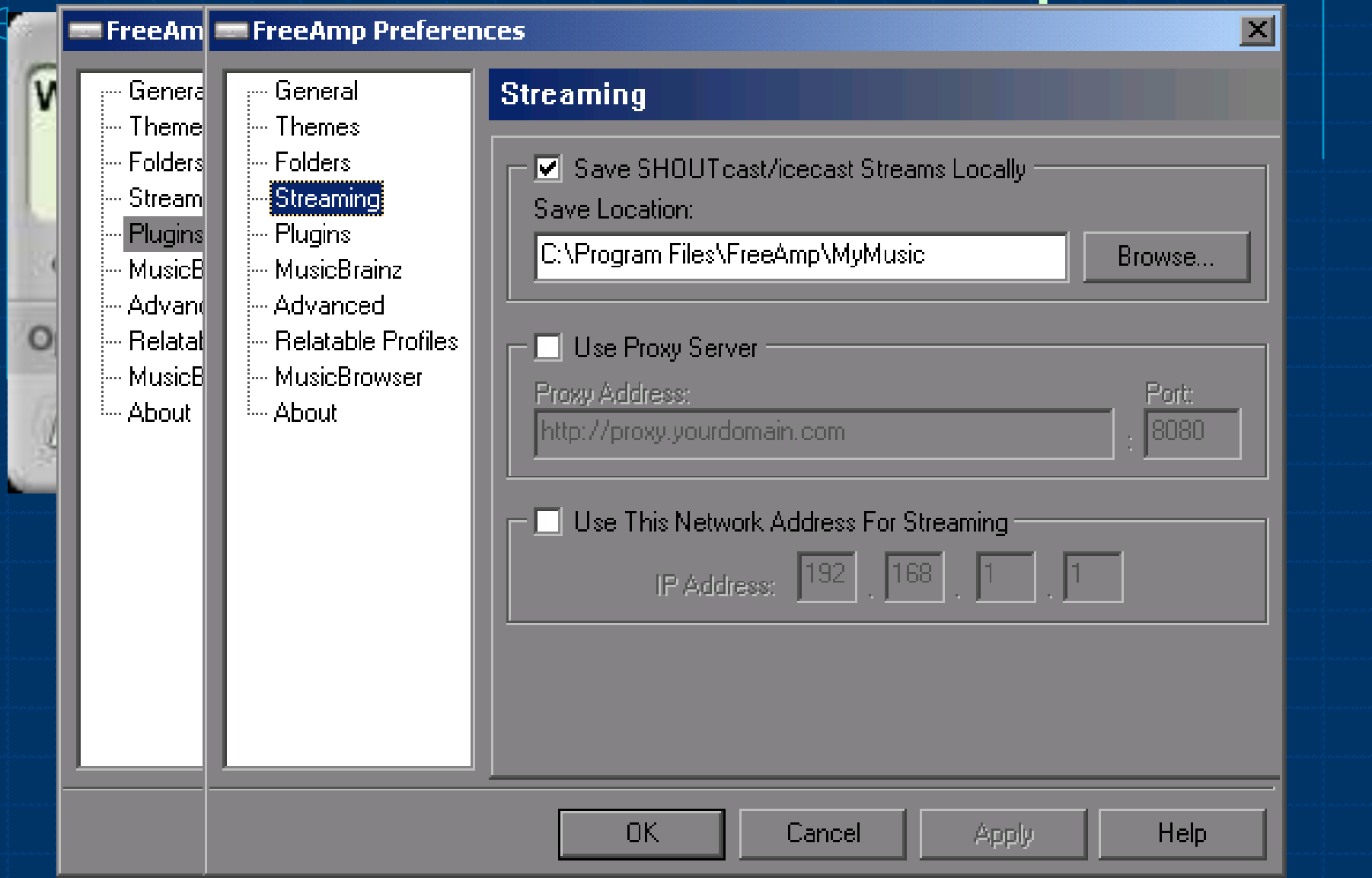
Streamripper

Streamripper started as a way to separate tracks via Shoutcast's title-streaming feature. This has now been expanded into a much more generic feature, where part of the program only tries to "hint" at where one track starts and another ends, thus allowing a mp3 decoding engine to scan for a silent mark, which is used to find an exact track separation.

Streamripper

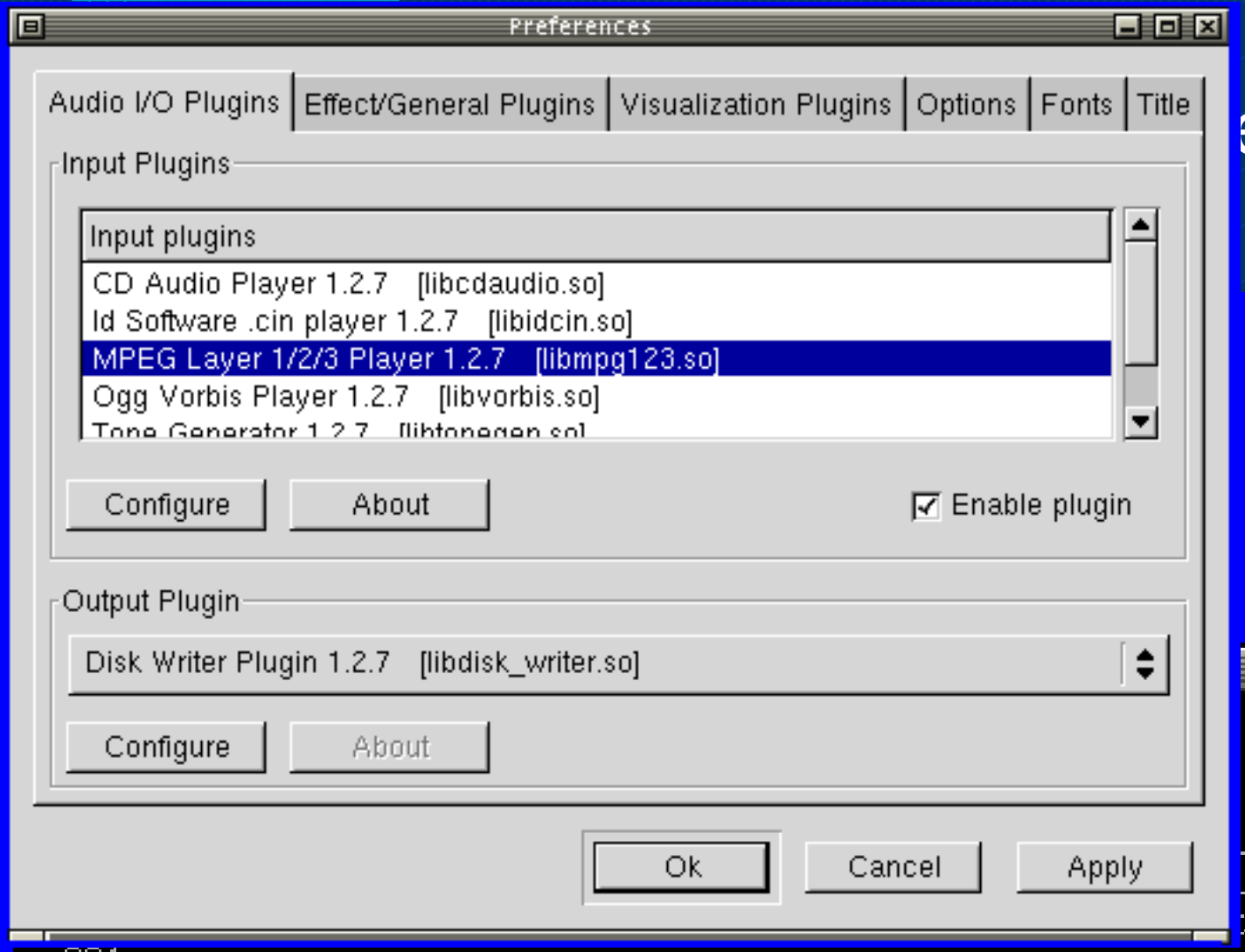


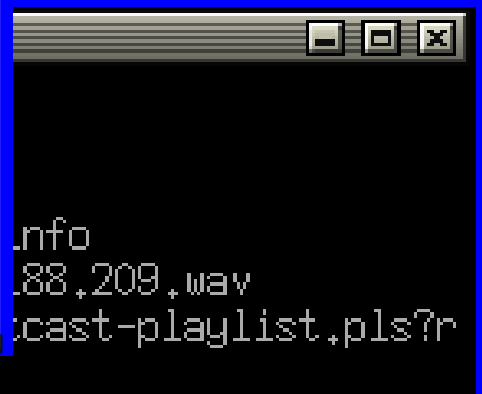
Freeamp 2.1


FreeAm
FreeAmp Preferences
Genera
Theme
Folders
Stream
Plugins
MusicB
Advan
Relatat
MusicB
About
General
Themes
Folders
Streaming
Plugins
MusicBrainz
Advanced
Relatable Profiles
MusicBrowser
About
Streaming
Save SHOUTcast/icecast Streams Locally
Save Location:
C:\Program Files\FreeAmp\MyMusic
Browse...
Use Proxy Server
Proxy Address:
Port:
http://proxy.yourdomain.com
8080
Use This Network Address For Streaming
IP Address:
192
168
1
1
OK
Cancel
Apply
Help

XMMS

er Plug-In





n=991

Protect the MP3 Streaming

- Embedded MP3s could help but someone can siphon the html
- .htaccess files could limit users
- Disk Writing and File Writing Plug-Ins won’t work.

Last Words

- Watermarking or embossing logos would own your media.
- Security through obscurity in a solution, sometimes.
- When you want to stream, decide on you security need first. Should the people have the right to save your content.

Links

http://www.interlog.com/~tcharron/wgetwin.html
http://www.souxin.com/en/stream-software-down.htm
http://www.afterdawn.com/software/audio_software/
http://www.stoik.com/products/morphman/mm30_svc.htm
http://astalavista.box.sk
http://www.streamking.com
http://www.eeye.com/html/Products/Iris/Download.html
http://classic.winamp.com/
http://classic.winamp.com/plugins/detail.jhtml?componentId=96985
http://streamripper.sourceforge.net/
ftp://ftp.cs.tu-berlin.de/pub/misc/freeamp/FreeAmpSetup_2_1_1.exe
http://windump.polito.it/
http://www.garykessler.net/library/file_sigs.html

QUESTIONS

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http://moloch.tv

http://tommEE.net