



“GPU-Accelerated Image Processing for Modern Moving Images: Tachyon Wormhole”

Cinnafilm[®]



Who is Cinnafilm?

Cinnafilm, Inc. is an industry leader in innovative video optimization solutions for television, film, and multi-media delivery.

Harnessing NVidia® graphics cards, Cinnafilm's patented GPU-based software is the world's fastest, highest-quality video conversion solution.

Headquartered in Albuquerque, NM, USA

Creator of Tachyon®, Tachyon Wormhole™, and Dark Energy®

Programming on GPUs since 2004



CinnaFilm Image Processing

A trusted name brand ensuring the highest possible quality...



Because we believe
Every Frame Matters.TM



Partners

Cinnafilm has partnered with Wohler to integrate the Tachyon Wormhole solution. Audio, captions, codecs, and other powerful third party solutions are part of the complete, integrated product.

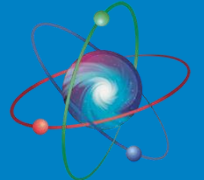


■ BASEBAND

■ STREAM

■ FILE

Tachyon[®] Wormhole[™]



**TACHYON
WORMHOLE**

*Wohler is the exclusive, global
distributor for TACHYON
WORMHOLE*

Version 2.0

Infinite Possibilities.



One Wohler.



What is TACHYON WORMHOLE?



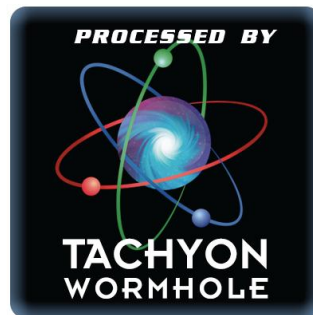
A Complete Video Conversion System

The world's first 'turn-key' 100% file-based solution for
Video, Audio & Caption MEDIA RETIMING

Used to resample video clips to different, precise lengths.


Tachyon Wormhole also provides unlimited formats, frame rates, telecine correction, and transcoding capabilities in an automated workflow.

Scalable to any throughput need.



Seeing (and hearing) is believing

Wohler ■ BASEBAND ■ STREAM ■ FILE



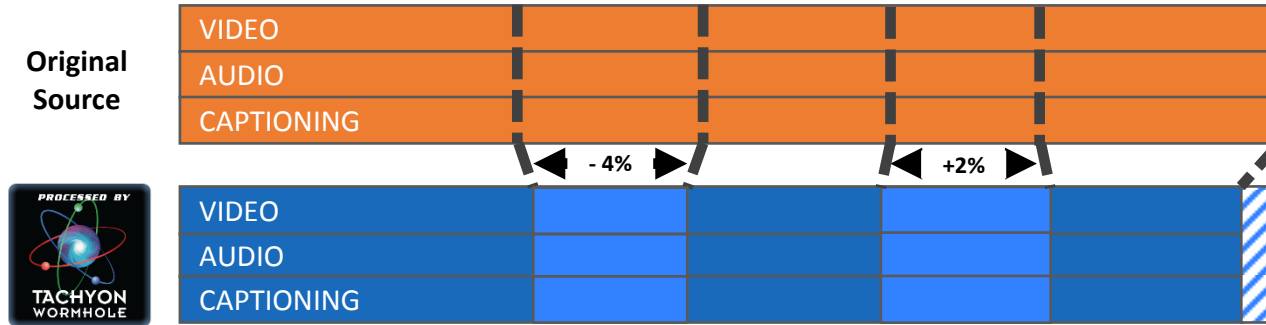
Left Video: Audi ultra
It retimes video, audio and caption data
30 Seconds (6% Faster)

Right Video: Tachyon Wormhole is unique
32 Seconds (Source)

Logos: radiant GRID, TACHYON WORMHOLE, Infinite Possibilities. One Wohler.

Reflection: The entire content area is reflected below the main interface.

Custom Runtime Modification



Features:

- Adjust run-time of file-based assets with no perceivable difference in quality.
 - Process video using Cinnafilm's motion compensated algorithms.
 - Precisely adjust audio run length and accurately correct pitch.
 - Automatically adjust closed-captions for the new asset run length.
- Delivers performance with two simultaneous conversion streams per appliance.
- Includes the award winning Standards Conversion capabilities of Cinnafilm's Tachyon.

Who Needs This

The Content Creator...

- If the final edit is too short or too long, Tachyon Wormhole can imperceptibly adjust the length to meet your target run length, eliminating costly trips to/from editing.
- Run-time alteration: Users can expand or compress the run-time of a video file to meet a specific target length due to creative imperatives or compliance edits.

For the Broadcaster...

- Run-time expansion: expand the run-time of a video file to meet a specific target length
- Run-time compression: shorten (compress) the run-time of a program in order to have more time for commercials, bumpers, or promos
- Content re-versioning: remove overhead of multiple manual edit orders when delivering multiple run length versions to many territories or many platforms

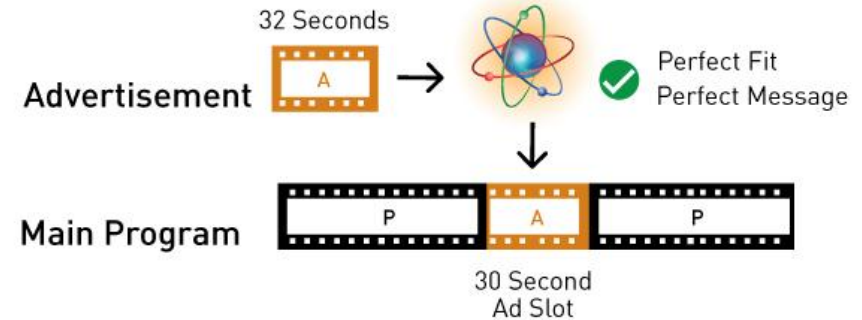
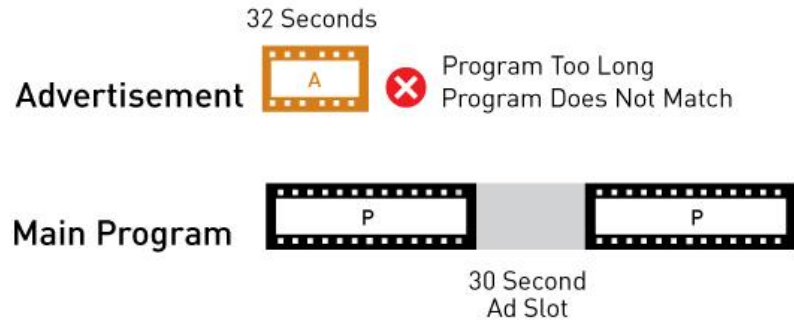
Shrink to Fit – Tell More in Less Time

SHRINK TO FIT

Hit any time target with the industry's most flexible time correction.

Key

-  Main Program
-  Advertisement
-  Tachyon Wormhole



Faster Turnaround



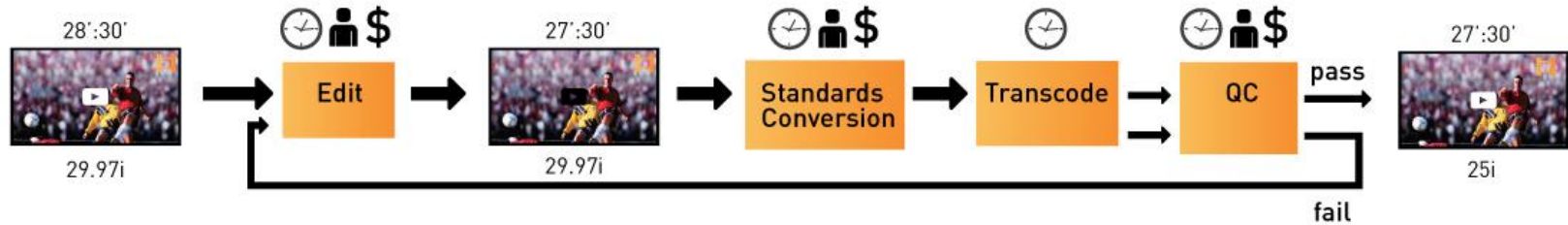
REDUCE PROCESS COMPLEXITY

Save Time. Reduce Complexity. Maximize Revenue.

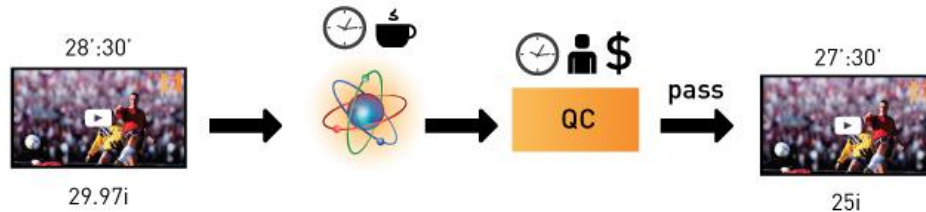
Key

- Main Program
- Advertisement
- Tachyon Wormhole

Old Process



New Wormhole Process



More Advertising = More Revenue

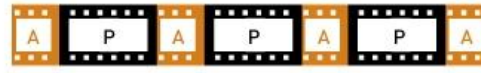
ADD MORE ADVERTISEMENTS

Evolve media transformation from a cost of doing business to a source of generating revenue.

Key

-  Main Program
-  Advertisement
-  Tachyon Wormhole

Original Program
4 Advertisements



27':30"



Input



Output

Retimed Program
7 Advertisements



Ad
Inserted

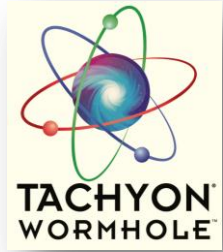
Ad
Inserted

Ad
Inserted

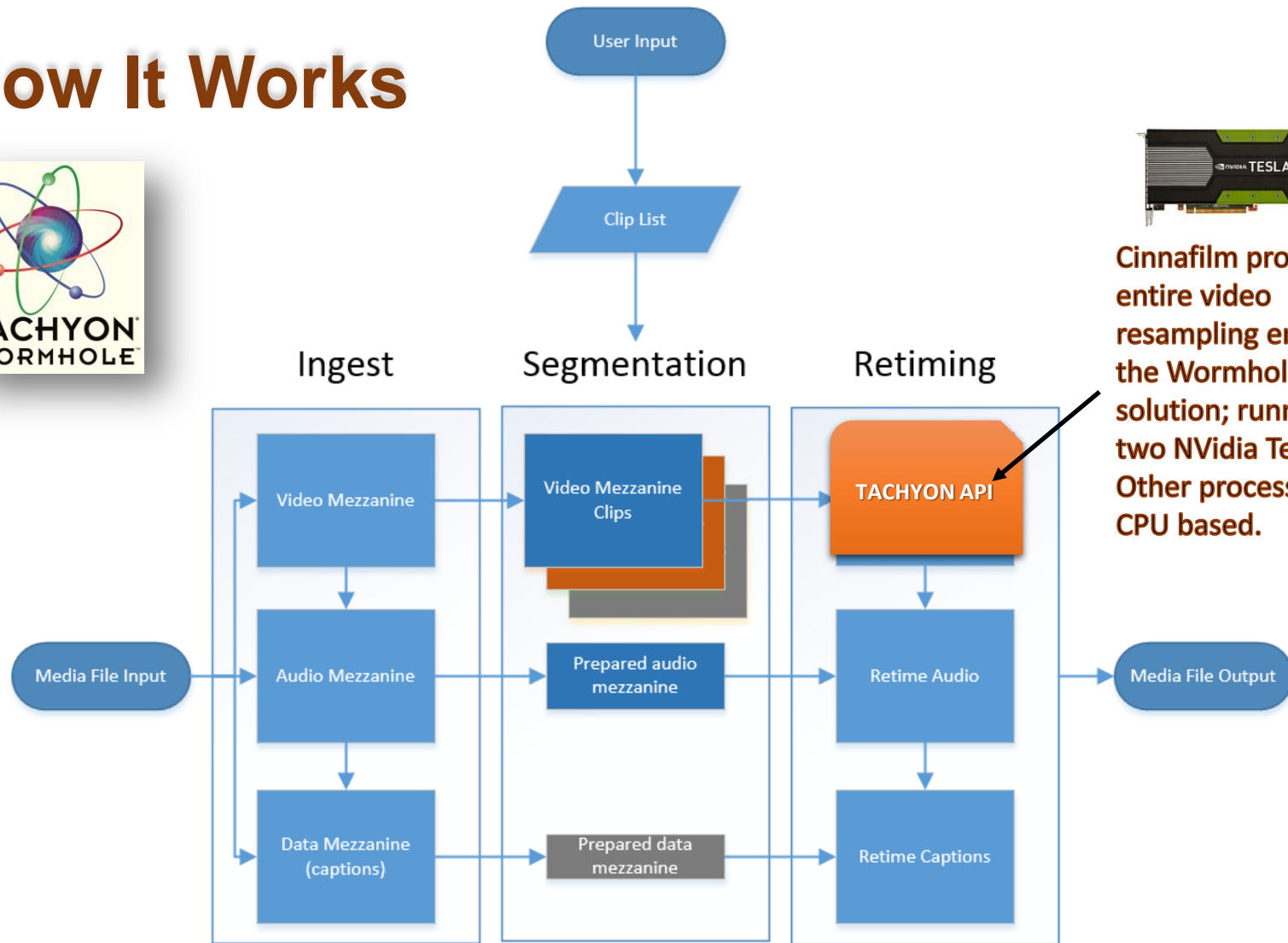
26':30"



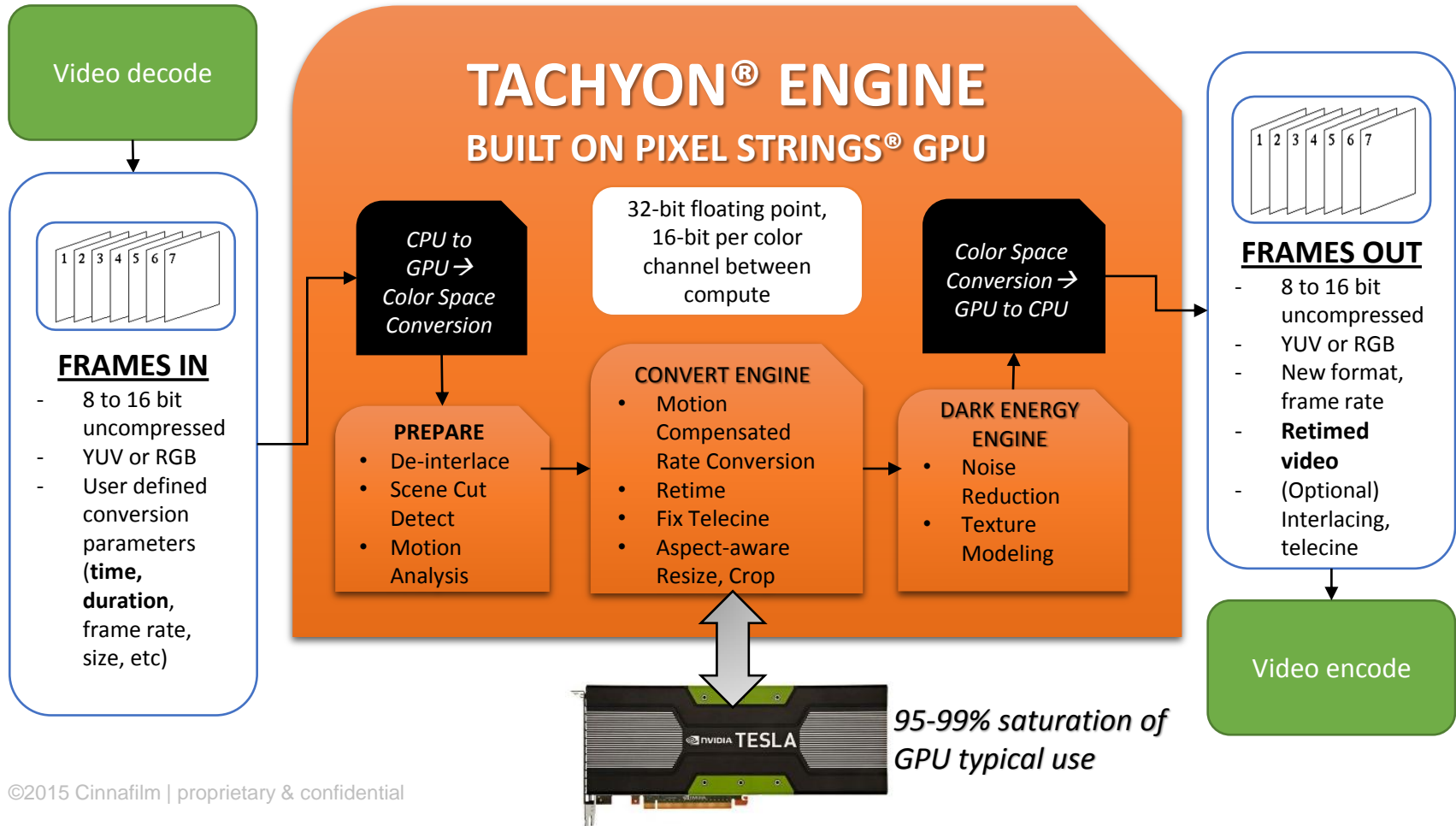
How It Works



Cinnafilm provides the entire video resampling engine to the Wormhole solution; running on two NVidia Tesla cards. Other processes are CPU based.



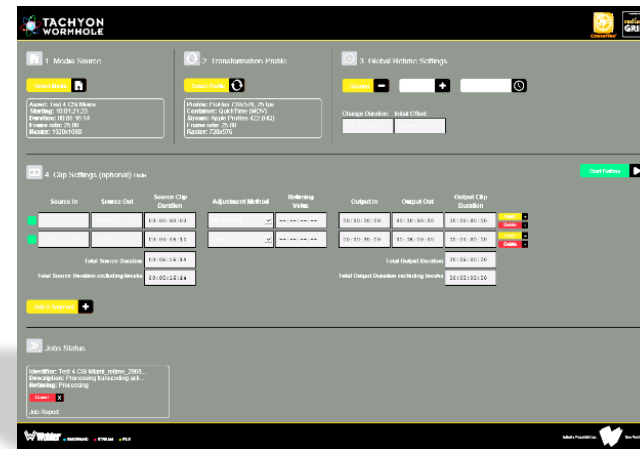
How It Works - Tachyon is 100% GPU based



Customized Control of Time

The Tachyon Wormhole UI can:

- Import a source file and expose its start time and duration
- Select a predefined transformation profile
- Express retiming of an entire asset as:
 - An explicit target program run length in HH:MM:SS:FF
 - As a reduction or expansion of program run length:
 - by a specific amount of frames or seconds
- Express retiming of segments within the asset as:
 - An explicit target segment run length in HH:MM:SS:FF
 - As a reduction or expansion of segment run length:
 - by a specific amount of frames or seconds
 - by allowing the system to *automatically calculate the required retime operation*
- Remove/add segments from the output rendition



The GPU Advantage



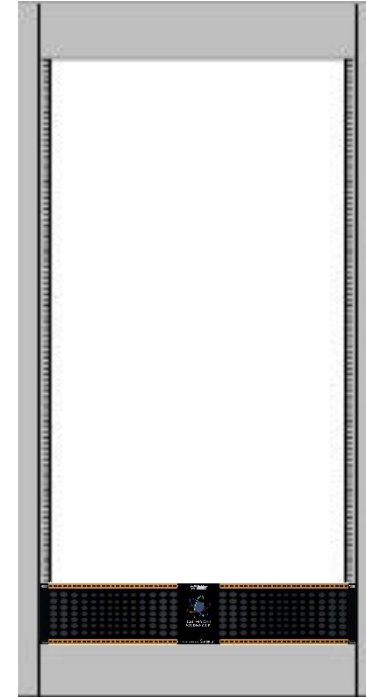
BASEBAND RELICS

- + ~20 RU
- + 2 streams per rack
- + >\$500,000
- + Slower than real-time
- + Hops between baseband & file

VS

GPU SOLUTIONS

- 4 RU +
- 2 NVidia GPU streams per unit+
- A fraction of the cost +
- Faster than real-time +
- 100% file-based +



“That, Mr. Anderson, is the sound of inevitability” – The Matrix

Innovation Awards



WINNER

Hollywood Post Alliance
Engineering Excellence
Award 2014



WINNER

NAB 2014 Best of Show
Award





QUESTIONS?

Lance@Cinnafilm.com

www.Cinnafilm.com

www.Retime.tv