

# CasparCG

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**FREE  
& OPEN  
SOURCE**

# What is CasparCG?

- Free and Open Source Video and Graphics Playout  
[www.casparcg.org](http://www.casparcg.org)
- Used 24/7 in national broadcasts since 2008 (SVT).
- Latest major version *CasparCG 2.0* released in March 2012.

# Who am I?

- CasparCG 2.0 Lead Developer (SVT 2010-2012)
- CasparCG Consultant (Redpatch 2012-Present)
  - Support, Training, Development

# Outline

- CasparCG 24/7 – Quick Summary
- System Overview
- Dynamic Graphics
- Video/Audio
- Video Cards
- Mixer
- Communication Protocols
- Diagnostics
- Questions?
- Hands-on

\* = not in CasparCG 2.0

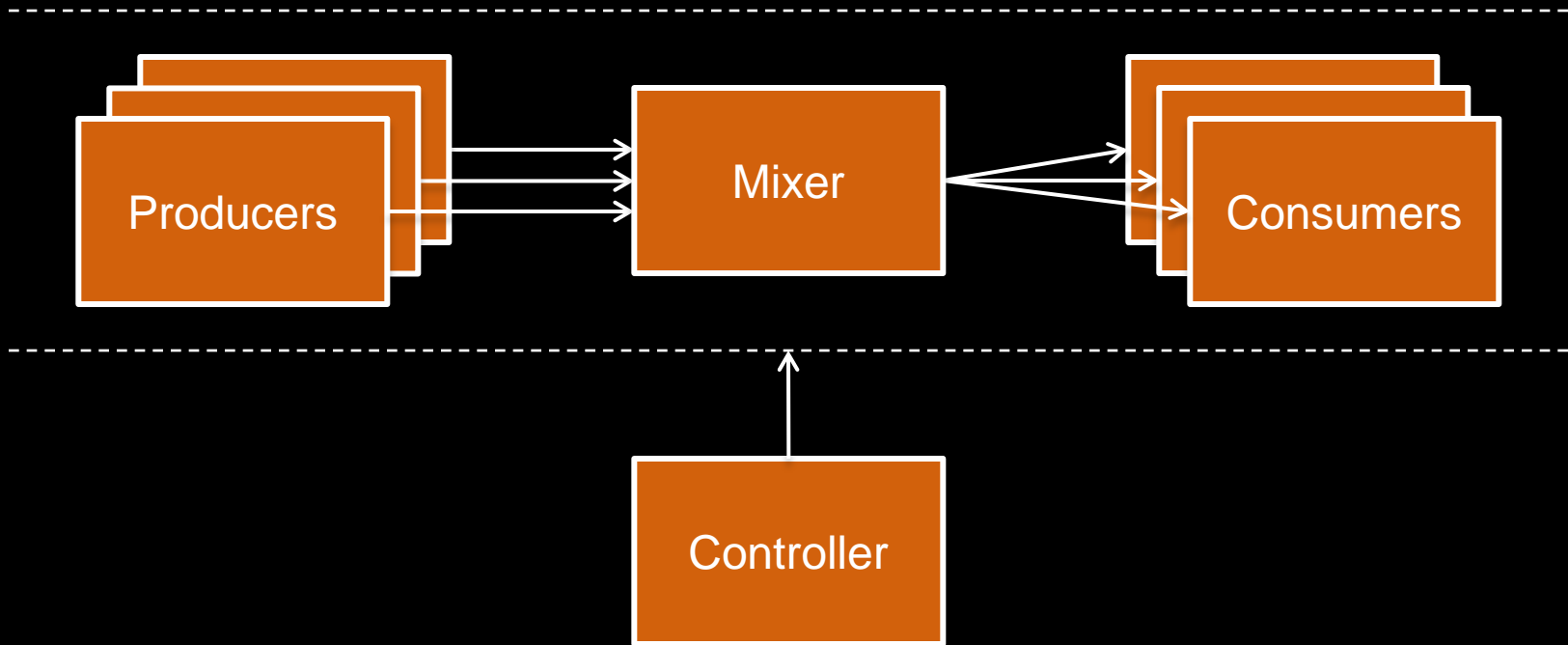
\*\* = improved since CasparCG 2.0

# CasparCG 24/7 – Quick Summary

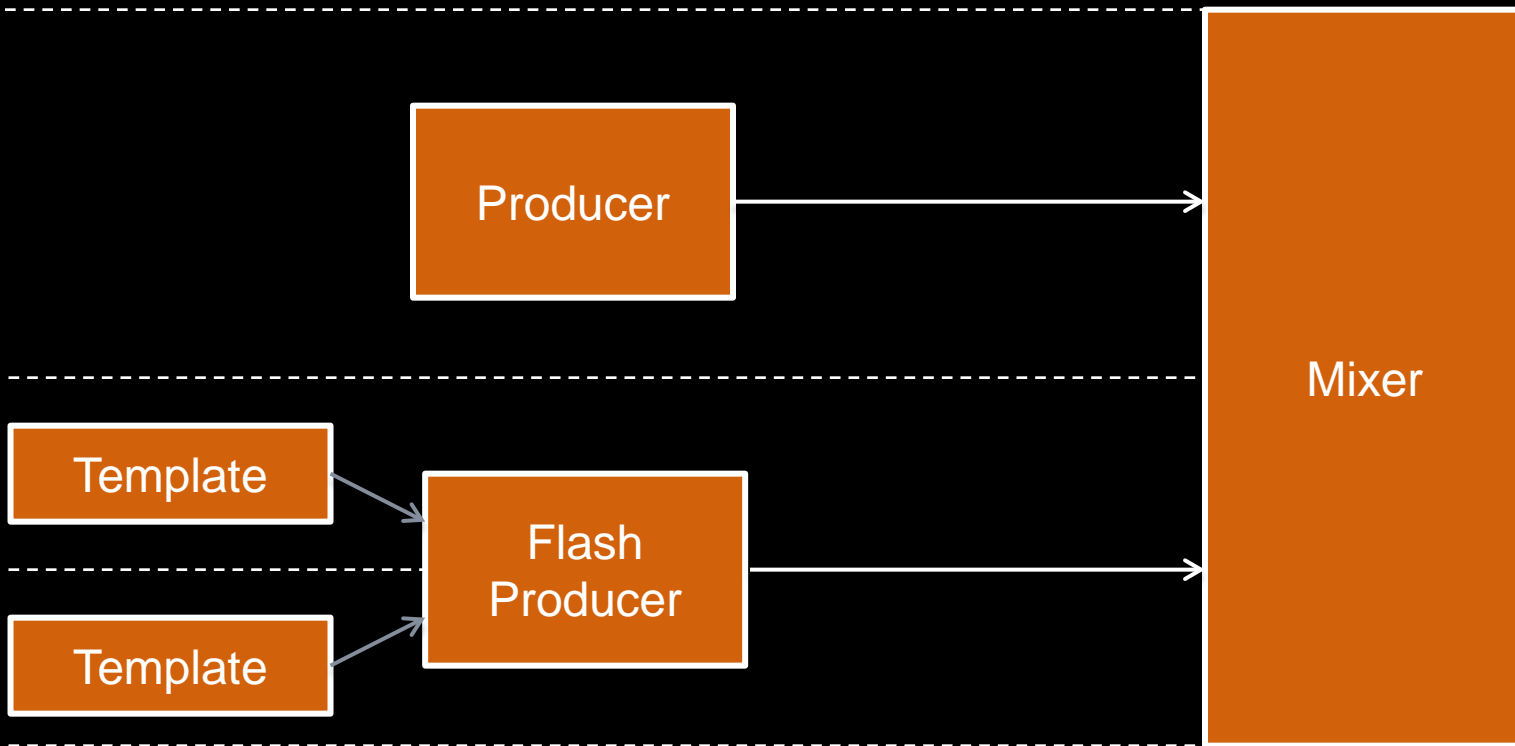
- CasparCG: 24/7 Graphics & Video Play-Out for Free
- Jonas Hummelstrand, SVT

# System Overview

# “Channels”



# “Layers”





# Dynamic Graphics

# Flash

- Dynamic Graphics
- Adobe Creative Suite
  - Existing workflow and tools
  - Import from After Effects, Illustrator, Photoshop
- Flash Develop ([www.flashdevelop.org](http://www.flashdevelop.org))
- Usable for both broadcast and web (e.g. Swedish Elections)

# Templates

- Flash Templates (.ft)
- Compressed Templates (.ct)
  - Flash Template, Data, and Images compressed into an archive

.ft

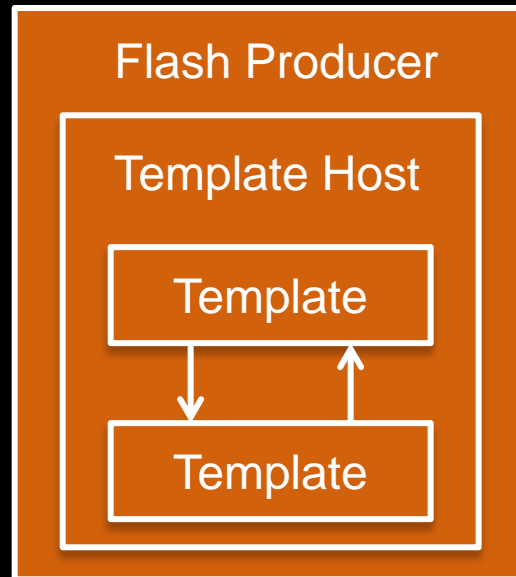
.ct



Template

# Template Host

- Inter template communication



# Template Generator

- “Compiles” Flash Project (.fla) into “Flash Template” (.ft)
  - Sets recommend properties for objects such as text fields etc...
  - Adds meta data such as field descriptions, author etc...
- Send compiled template (.ft) directly to server and test

Flash CS6 not yet supported

# Creating Templates

- See, “[Tutorial: Create a Dynamic CasparCG Template with Video and Audio](#)” by Jonas Hummelstrand.

Video/Audio

# FFmpeg

- [www.ffmpeg.org](http://www.ffmpeg.org)
- Video/Audio
- Decoding/Encoding
- Supports most formats and containers
  - DVCPRO, DNxHD, ProRes, VP6, VP8, H264, and more...
  - mxf, mp4, mov, and more...



# FFmpeg Producer

- Decoding (Multithreaded CPU)
- Automatic Conversion
  - Scaling (GPU)
  - Temporal De-interlacing (Multithreaded CPU)
  - Interlacing (GPU)
  - Frame Rate\*\*
  - Aspect Ratio Correction\* (GPU)
- libavfilter
- Streaming\*
- Variable Rate Playback\*
- Seeking\*\*
- Sub-clips

# FFmpeg Consumer

- Encoding (Multithreaded CPU)
- x264
- Streaming\*

# Video Cards

# Blackmagic

- [www.blackmagic-design.com](http://www.blackmagic-design.com)
- Video Cards
  - Decklink
    - HD Extreme 3D
    - Quad
  - Intensity
  - Ultrastudio
- Producer/Consumer
- 32 bit Embedded Audio

# Bluefish

- [www.bluefish444.com](http://www.bluefish444.com)
- Consumer
- 24 bit Embedded Audio

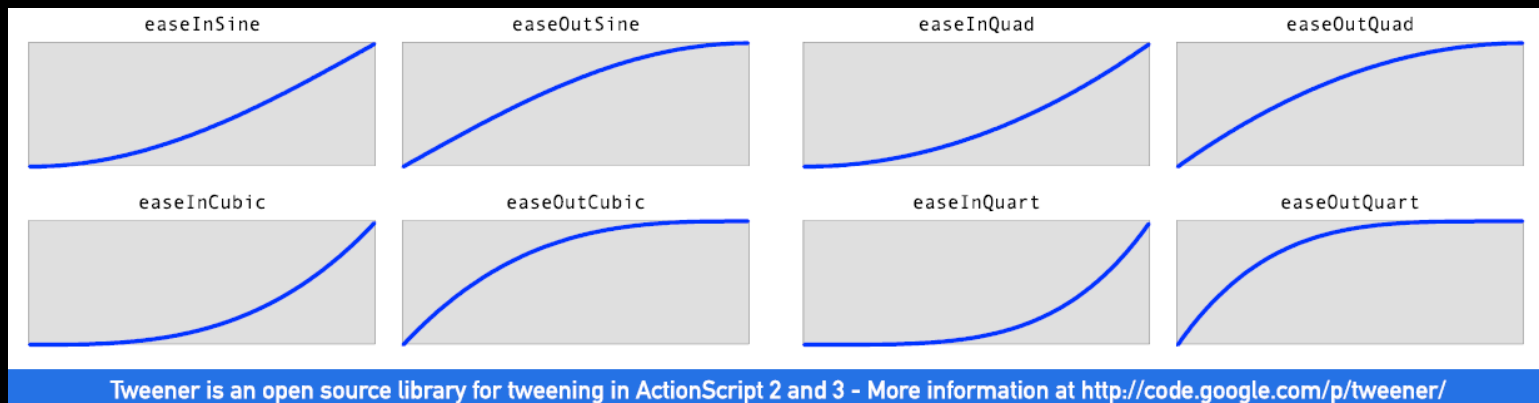
Mixer

# Video Mixer

- Fully GPU Accelerated (NVIDIA, OpenGL 3.0)
- CPU Accelerated Fallback\*
- Layer Composition
- Transformations
- Separate Key/Alpha
- Blending Modes

# Transformations

- Video
  - Scaling
  - Clipping
  - Translations
  - Opacity, Brightness, Saturation, Hue, Gamma, Levels
- Audio
  - Volume
- Tweens





# Transformations

- Examples
  - Transitions
    - Wipe, Slide, Push, Mix, Cut
  - End Credit-Squeeze
  - Multiviewer

# Separate Key/Alpha

- Masking
- Useful for codecs without alpha support (e.g. H264)
  - “myvideo.mov” and “myvideo\_a.mov”
- Decklink Quad

# Blending Modes

- Modes
  - Overlay
  - Screen
  - Multiply
  - Add
  - etc...
- Examples
  - Key Black Background
  - “Instant Sex”

# Communication Protocols

# Advanced Media Control Protocol (AMCP)

- Simple text based UTF8 protocol
- Not standardized (SVT in-house)
- [casparcg.com/wiki/CasparCG\\_2.0\\_AMCP\\_Protocol](http://casparcg.com/wiki/CasparCG_2.0_AMCP_Protocol)

LOADBG 1-1 MYVIDEO PUSH 50 LOOP

PLAY 1-1

MIXER 1-1 FILL 0.25 0.25 0.50 0.50 50 EASEINSINE

# Open Sound Control (OSC)\*

- [www.opensoundcontrol.org](http://www.opensoundcontrol.org)
- Pushes server state to remote clients
- Monitoring

channel/1/layer/1/time 0.5 20.0

channel/1/layer/1/opacity 0.23

channel/1/layer/1/state playing

channel/1/layer/1/profiler/time 0.02 0.20

Diagnostics

# Real-Time Graphs



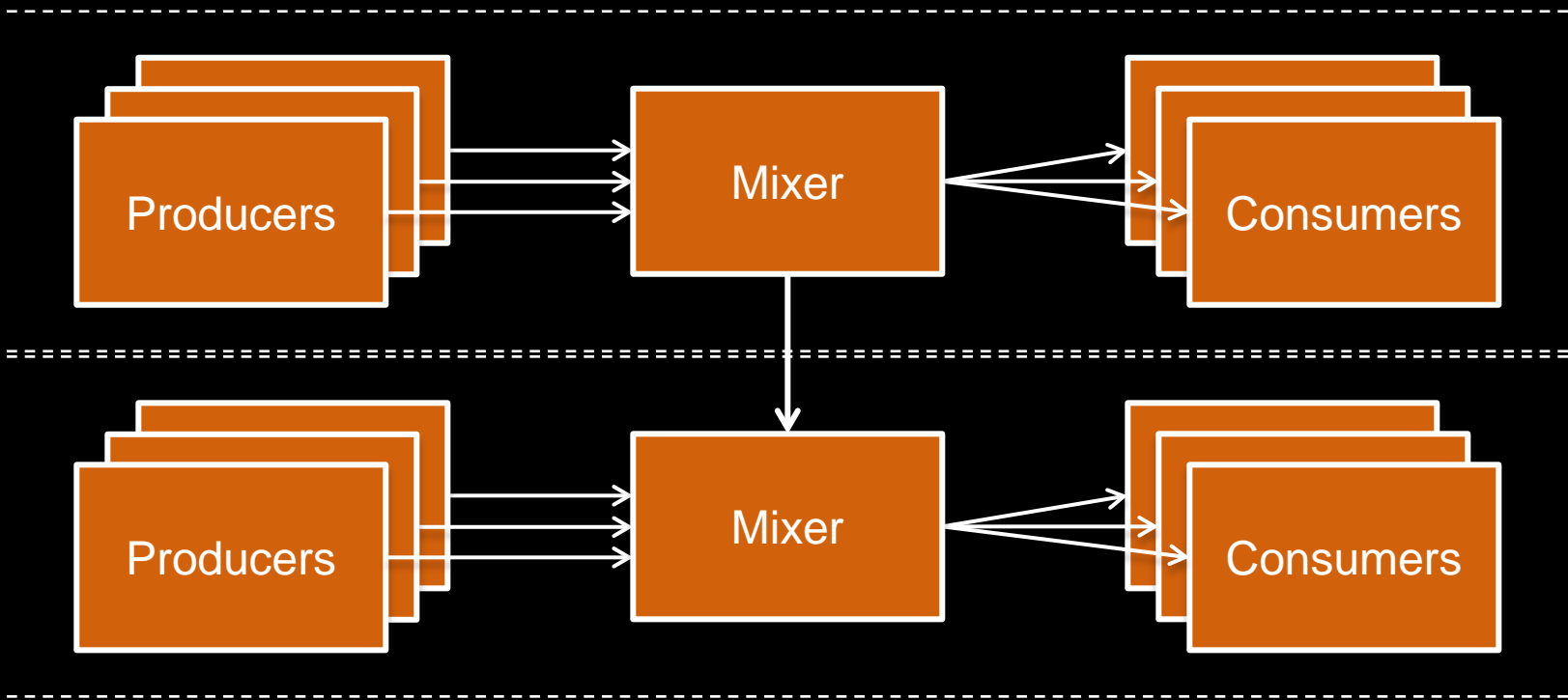
# Log File

- New log file for every day
- Logs
  - Configuration
  - Computer info
  - All communication
  - Performance warnings
  - etc..

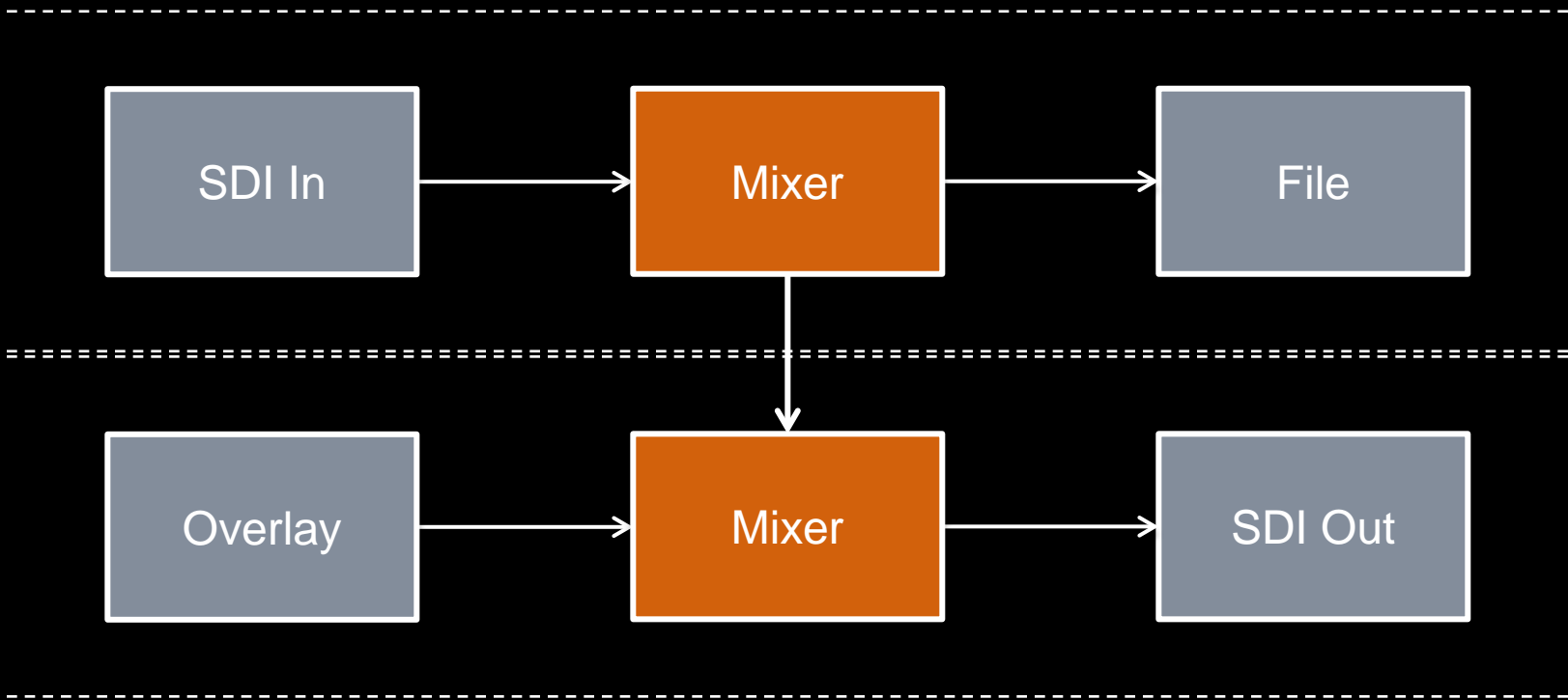
# Channel Preview

- CHANNEL\_GRID

# “Re-routing”\*



# “Re-routing”\*



# Hardware

- Intel Core i7 3820 3.6 GHz ~ 300\$
- GeForce GTX 570\*\* ~ 300\$
- Decklink Quad ~ 1000\$
- 256 GB SSD ~ 200\$
- Other ~ 500\$
- CasparCG = 0\$

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~ 2300\$ ~ 1900€

\*Prices from [www.amazon.com](http://www.amazon.com)

\*\*CasparCG is developed with Quadro 2000

# Questions?

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