

# Cost effective file-based Production

David Kirby  
BBC Research, UK

# Aims

From studio...



... to edit suite



# Aims

- Low-cost production: recording to edit
- Use Open Standards
  - proving MXF and AAF
- Providing content in multiple resolutions
  - full quality, ‘proxy’ and ‘browse’
- SD and HD capable
- Testing automated production ideas

## What do we need?



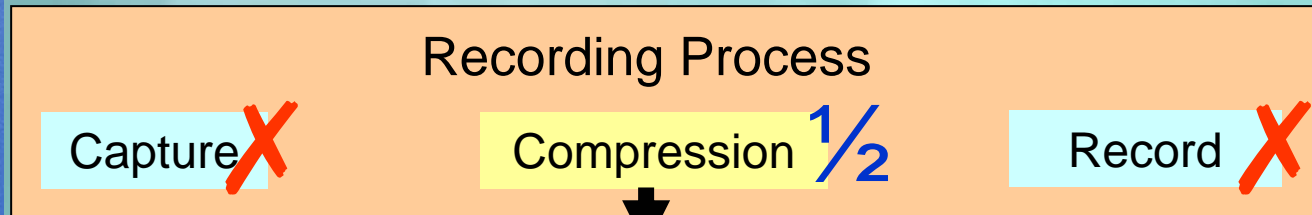
- Capture
- Compression
- Recording
- Controller
- Production Logging

- Content storage
- Transfer to edit system
- Browsing content
- Database





# Which software for recording?



- Typical formats
  - Avid 2:1, 10:1, 15:1, 20:1..., DVCPPro25, 50, 100, SMPTE VC3, IMX, MPEG...

 **FFMPEG**

- MXF file wrapping
- AAF content lists

libMXF

AAF SDK2.0

# Which software for control?



User applications:

Control **X**

Logging **X**

Underlying software:

- Communications

CORBA using ACE/TAO

HTTP using Apache/Firefox

- User interface

wxWidgets, Qt, html

- Database

Postgres

# Software for storage/transfer?



## Into the Edit Suite

- Edit storage
- Transfer to edit system
- Content Review

- SAMBA
  - Using virtual file system
- AAF SDK 2.0
- FFMPEG + web page replay

# What's missing?

- Capture
- Recording
- Control



BBC Research - Ingex project

<http://ingex.sourceforge.net/>



# What else is needed?

- Avid n:1 'family' of codecs
  - MJPEG-based
- DVCPPro50, 100 codecs
- SMPTE VC3

Plug-ins recently developed  
and being included in FFMPEG

# An Open Source solution

Ingex

FFMPEG

libMXF

Apache

SAMBA

AAF SDK

Postgres

libJPEG

MediaHarmony

Portaudio

shttpd

wxWidgets

ACE - CORBA

Estimated: 1 950 000 lines of software

90% pre-existing

Does it work?

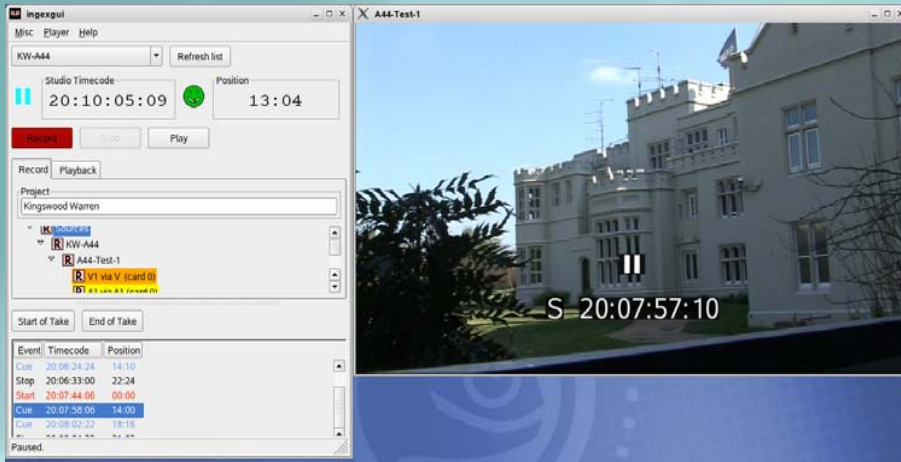
# Ingex Recorder



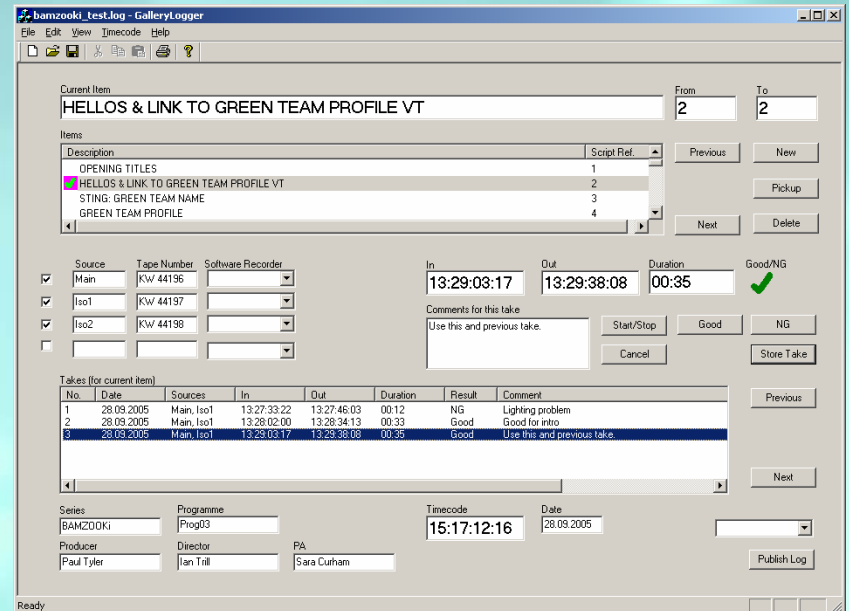
- Up to 4 SDI inputs (video & audio)
  - Encoding at online quality
    - e.g. Avid 2:1, DVCPro50, IMX50
  - Encoding at offline quality
    - e.g. 10:1, 20:1, MPEG, etc.
  - Local disc storage
    - e.g. 30 hours @ 2:1
  - Entirely Open Source software
- 
- Cost: about €14,000



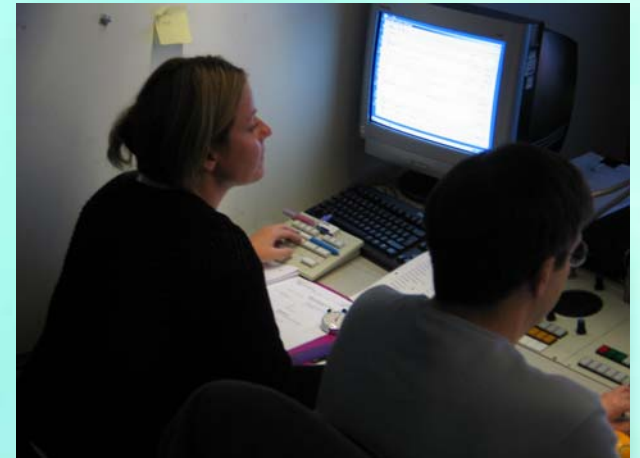
## Two Recorder Controllers



Controller



Logging  
controller



# MediaHarmony Server



Avid editor

Final Cut Pro  
editor

- SAMBA + virtual file system
- Avid and FCP access
- 290 hours @ 2:1
- Cost € 9000

# Web page from log

## Sequence 10: 1ST CONTEST EXPLANATION (TEAMS R1 & G1)

Take	Timecode	Good/NG	Description	Main	Iso 1
1	16:37:20:03 - 16:37:28:16	NG	CUEING	<a href="#">BRD251641</a>	<a href="#">BRD251641</a>
2	16:37:59:01 - 16:38:26:21	NG	JAKE NG AT END	<a href="#">BRD251641</a>	<a href="#">BRD251641</a>
3	16:38:55:24 - 16:39:24:01	Good	ONE MORE	<a href="#">BRD251641</a>	<a href="#">BRD251641</a>
4	16:40:52:19 - 16:41:22:22	Good		<a href="#">BRD251641</a>	<a href="#">BRD251641</a>

## Sequence 12: TEAMS R1 & G1 CREATE UBERZOOK

Take	Timecode	Good/NG	Description	Main
1	15:55:35:14 - 15:55:43:03	NG		<a href="#">BRD251641</a>
2	15:55:45:19 - 16:03:34:21	Good		<a href="#">BRD251641</a>

# Production Trials



# Children's programme “BAMZOOKi”

- October 2005
- 3 video inputs
- Coded as Avid 2:1
- Recorded 15 of 20 programmes



# “Eastenders”

- Four channels (Main + 3 ISOs)
- DVCPro50 encoding
- “MediaHarmony” server for storage
  - also creates 20:1 for offline editing



# BBC Radio 1 Concert

FooFighters August 2007



5 inputs

DV25 and Avid 20:1

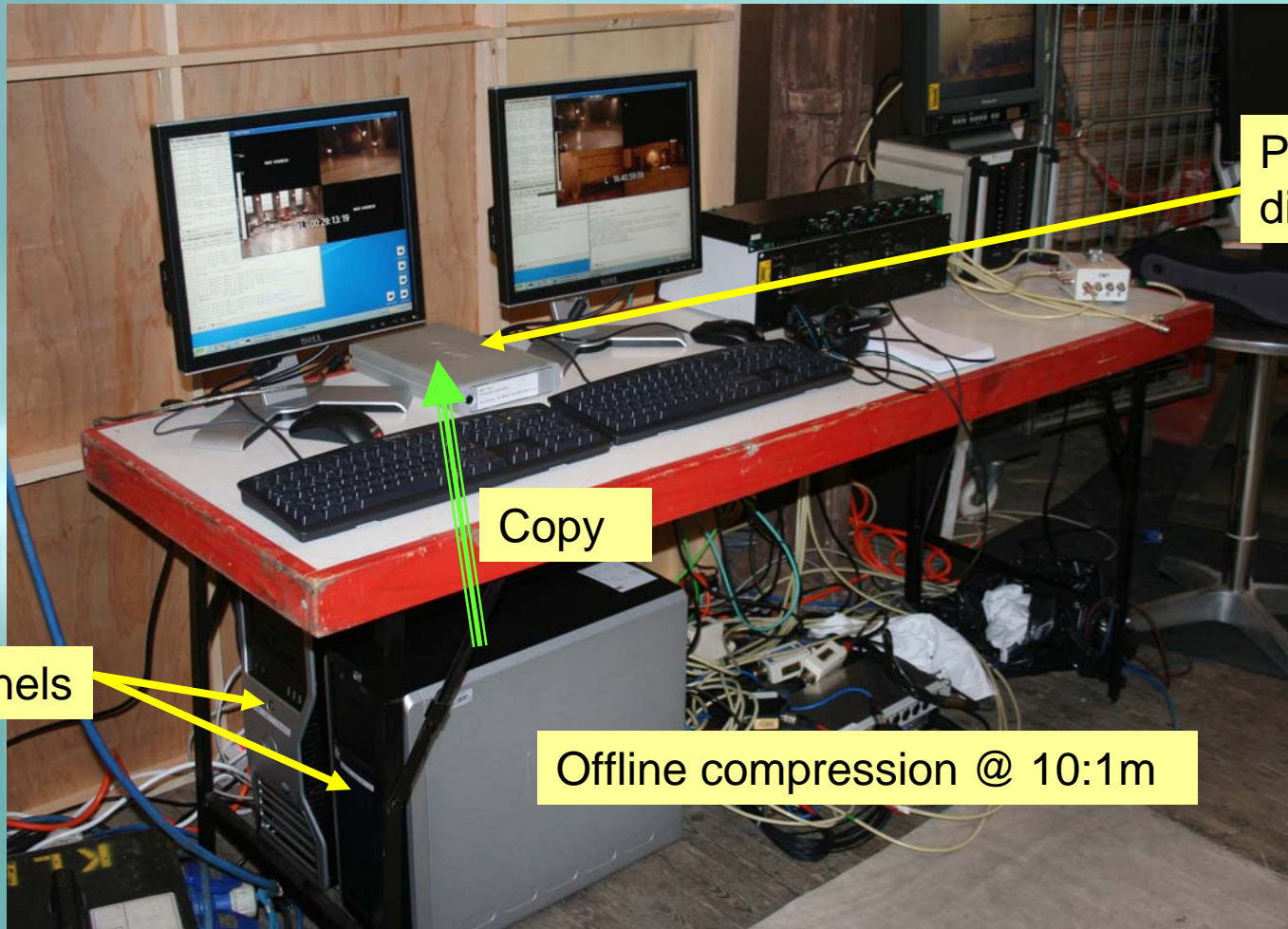


# Dragons' Den (Pinewood)





# Technical setup



Portable  
disc

Copy

7 channels

Offline compression @ 10:1m

# Conclusions

- It works!
- Production teams enthusiastic
- Wider usage being considered
- How can it be supported?

# URLs

Ingex

<http://ingex.sourceforge.net>

FFmpeg

<http://ffmpeg.mplayerhq.hu>

MXF & AAF

<http://ingex.sourceforge.net/libMXF>

<http://sourceforge.net/projects/aaf>

# Publications

BBC Research White papers  
on Ingex, MXF and AAF

[www.bbc.co.uk/rd/pubs/whp/](http://www.bbc.co.uk/rd/pubs/whp/)

whp133

whp141

whp155



