



Analog to Digital Migration

by Richard Glaser



Background

● The Good

- Aid in preserving & restricting analog materials
- Migrate analog audio/video collection to digital
- Supplement & replace functionality of A/V router
- VideoCommander MX-3200



Background

● The Bad

- Limited Funding
 - Xserve Dual G5 w/Xserve RAID
- Staff
 - No addition staff for project
 - Limited existing staff time
 - NOT in our job description, but I volunteered ;-(

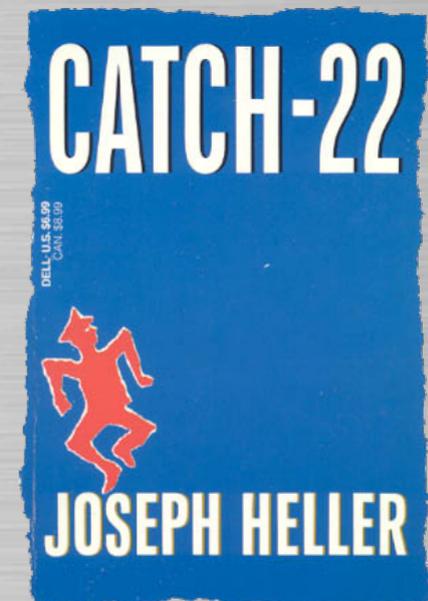
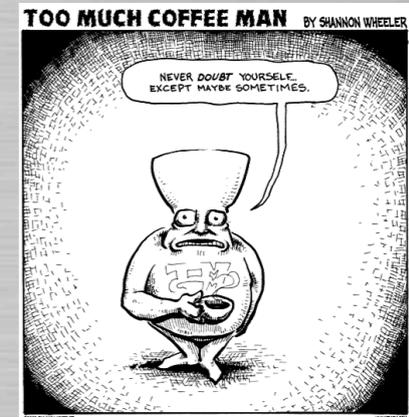


UNIVERSITY OF UTAH
STUDENT COMPUTING LABS

Background

● The Ugly

- Doubtful Higher-Ups
 - Didn't believe it could be done
 - No addition staff or budget
 - Until we have finished product
- Very political on campus & dept.



UNIVERSITY OF UTAH
STUDENT COMPUTING LABS

History

- Setup QTSS Server
- Setup Ingestion/Editing Station
 - Used old equipment
 - Analog devices - Umatic, VHS, Cassette, etc.
 - DV Deck for media conversion & A/V backup
- Standardized on MPEG-4 Part 2 Format
 - Lowest common denominator
 - Media Architectures & Players (QT, Real Media, Windows Media, VLC)
 - Preparing to support AVC (MPEG-4 Part 10)



History

- Choose QuickTime as Media Architecture

- Picked for support, quality and flexibility
- Used qtif image format for poster movie with embed tags.

```
<EMBED QTSRC="Actual.mov" HEIGHT="yyy" WIDTH="xxx"  
SRC="UNeedQT.qtif" TYPE="image/x-quicktime"  
PLUGINSPAGE="http://www.apple.com/quicktime/download/" >
```

- Prevents other players to hijack streams



History

● Media Access Restriction

- Originally, done using a Virtual Host with **allow** & **deny** directives.

AllowOverride None

Allow from <subnet> <ip address>

Deny from all

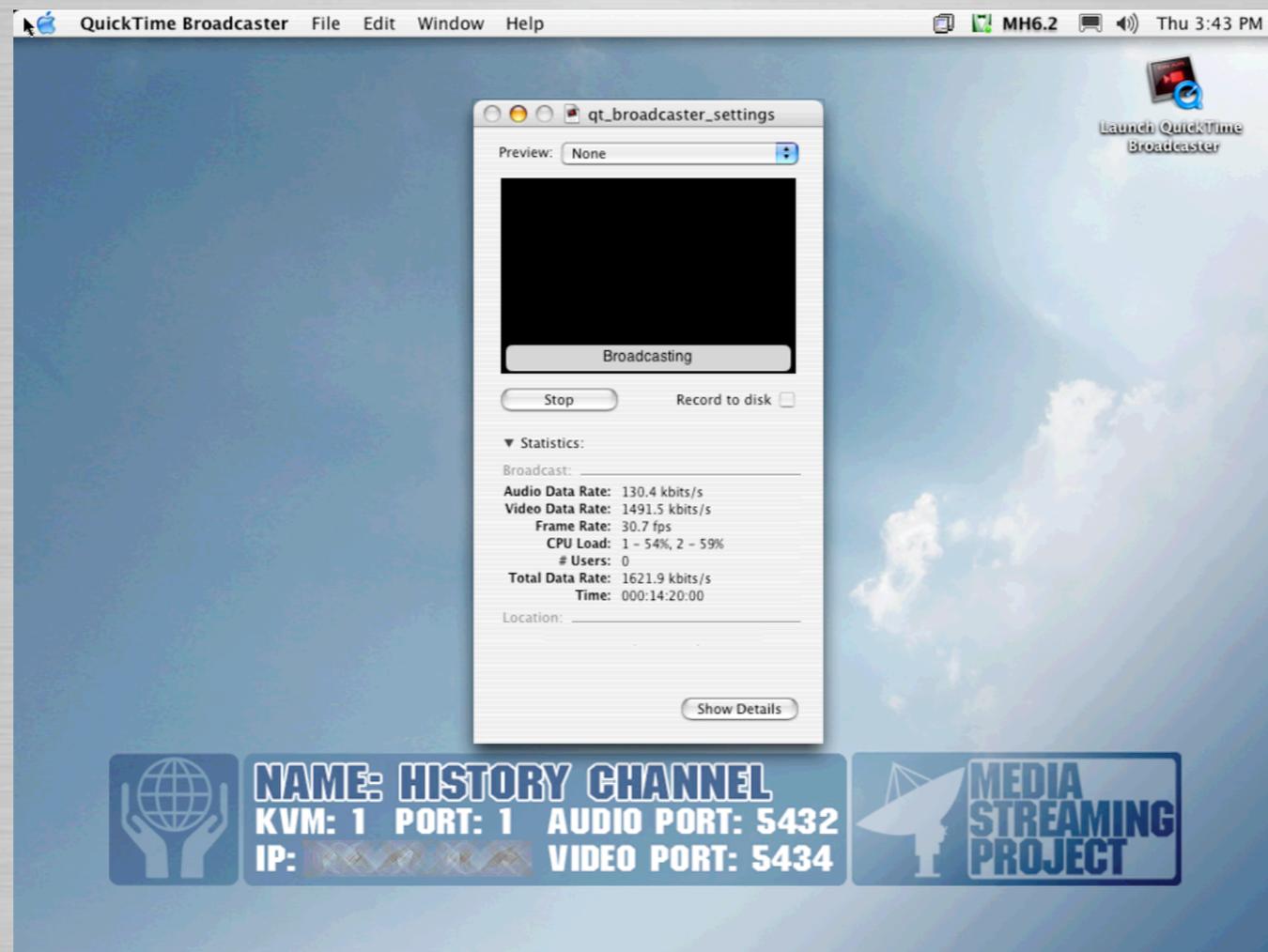
Order deny, allow

- Moved to home-brew Media Asset Database
 - More info later...



History

- Added multiple streamed TV Channels



The screenshot shows the QuickTime Broadcaster application window with the settings panel open. The settings panel displays the following information:

- Preview: None
- Stop button
- Record to disk checkbox (unchecked)
- Statistics:
 - Broadcast:
 - Audio Data Rate: 130.4 kbits/s
 - Video Data Rate: 1491.5 kbits/s
 - Frame Rate: 30.7 fps
 - CPU Load: 1 - 54%, 2 - 59%
 - # Users: 0
 - Total Data Rate: 1621.9 kbits/s
 - Time: 000:14:20:00
- Location: _____
- Show Details button

At the bottom of the screenshot, there is a blue banner with the following text:

NAME: HISTORY CHANNEL
KVM: 1 PORT: 1 AUDIO PORT: 5432
IP: [IP ADDRESS] VIDEO PORT: 5434

Logos for "MEDIA STREAMING PROJECT" and "UNIVERSITY OF UTAH" are also visible.



UNIVERSITY OF UTAH
STUDENT COMPUTING LABS

History

● Added streamed TV Channels

- Used old hardware

- CPU - Power Mac G4 Dual 1.25 GHz

- Analog to DV - Pinnacle miroMOTION DC30

- Driver - Xact (Open Source Driver)

<http://www.alfanet.it/squared5/dc30xact.html>

- Broadcasting - QuickTime Broadcaster 1.0.1

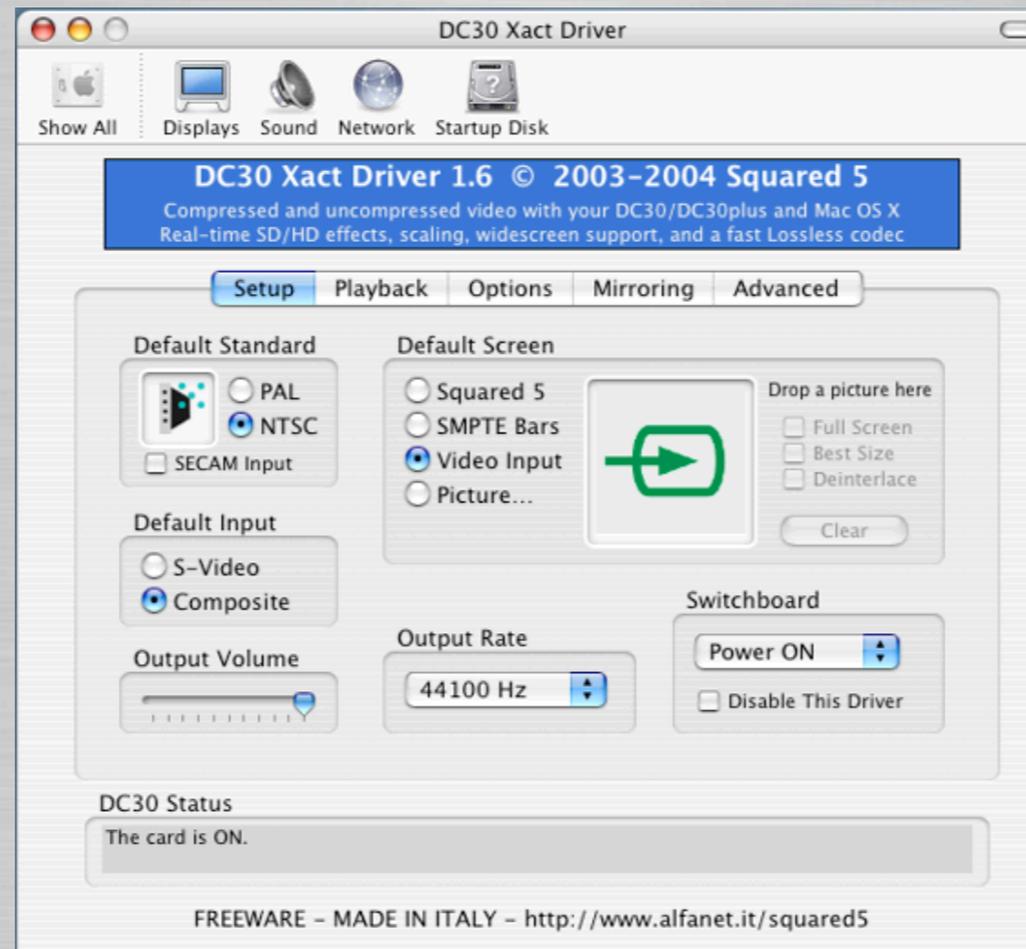
- Will move to QT 7.0.1 & QTB 1.5 after WWDC



UNIVERSITY OF UTAH
STUDENT COMPUTING LABS

History

● Xact example...



History

- Startup QuickTime Broadcaster
 - Use this AppleScript...

```
tell application "QuickTime Broadcaster"  
    delay 5  
    if (exists document 1) then  
        start document 1  
        return "broadcast"  
    end if  
end tell
```



History

- Added Live A/V Source Streams

- Using sources from A/V Router

- Users have NO control, just watch or listen

- Direct analog sources (VHS & DVD)

- Users can remotely control devices

- Hardware - IRTrans - USB Infrared Controller

- Software - iRed



History

● Added Media Asset Database



The screenshot shows the W-Media Streaming website interface. The header features the title "W-MEDIA STREAMING" in a stylized yellow font with a satellite dish icon on the left and several circular icons on the right. Below the header is a navigation bar with links for "About", "Contact", "Help", "Home", "Info", and "Search".

The main content area is divided into several sections:

- Location:** MMC
- Authentication:** User: Guest, UNID: [input field], Password: [input field], Login button.
- New Media:** A list of links including "Stream on Demand #3", "All Mqrs, May '05-UniPRINT", "All Mqrs, May '05-HR", "All Mqrs, May '05-Status", and "Mac Mqrs, Apr '05-Xsan".
- Popular Media:** A list of links including "CNN News Channel", "Discovery Channel", "All Mqrs, Apr '05-Status", "History Channel", and "Mac Mqrs, May '05-New".
- RSS Feeds** and **Podcasts** sections.

The main content area features four large boxes representing different media categories:

- CLASSROOM:** Archived Presentations & Instruction. Links: All Managers, Mac Managers.
- TELEVISION:** Live Television Streams. Links: CNN, Discovery, and History Channels.
- AUDIO:** Music, Spoken Word, & Books on Tape.
- VIDEO:** Cinema, Music, Fine Art, & Educational Media Stream on Demand.

Below these boxes is a text prompt: "Click on the regions above to browse the media database."

The footer contains the copyright notice: "© 2005 - Student Computing Labs - Marriott Library - University of Utah"



UNIVERSITY OF UTAH
STUDENT COMPUTING LABS

History

● Added Media Asset Database

- Supports ACL's
 - Multiple groups based on IP address, subnet or range
 - Dept A, Dept B, & Dept C...
 - Lab A, Lab B, & Lab C...
 - Campus & off-campus
 - Based on authentication (i.e. uNID)
 - Based on group defined in db, in future LDAP
 - Hidden or Visible



History

Location →
Based on IP

 **Location:** MMC

 **Authentication**

User: Guest

uNID:

Password:

 **New Media**

- [Stream on Demand #3](#)
- [All Mqrs, May '05-UniPRINT](#)
- [All Mqrs, May '05-HR](#)
- [All Mqrs, May '05-Status](#)
- [Mac Mqrs, Apr '05-Xsan](#)

 **Popular Media**

- [CNN News Channel](#)
- [Discovery Channel](#)
- [All Mqrs, Apr '05-Status](#)
- [History Channel](#)
- [Mac Mqrs, May '05-New](#)

 **RSS Feeds**

 **Podcasts**



History

Authentication →
Based on Kerberos

 **Location:** MMC

 **Authentication**

User: Guest

uNID:

Password:

 **New Media**

- [Stream on Demand #3](#)
- [All Mqrs, May '05-UniPRINT](#)
- [All Mqrs, May '05-HR](#)
- [All Mqrs, May '05-Status](#)
- [Mac Mqrs, Apr '05-Xsan](#)

 **Popular Media**

- [CNN News Channel](#)
- [Discovery Channel](#)
- [All Mqrs, Apr '05-Status](#)
- [History Channel](#)
- [Mac Mqrs, May '05-New](#)

 **RSS Feeds**

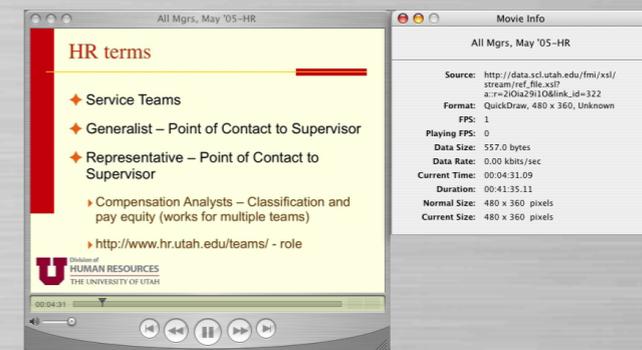
 **Podcasts**



History

● Added Media Asset Database

- Securing of stream direct URL
 - Use random number for each ACL
 - Different for each ACL (Location, Authentication, Group, hidden/visible)
 - Changes daily on QTSS server & Database
 - QTSS - Use cron to update symlinks
 - Database - Updates with script



History

● Added Media Asset Database

- RSS & Podcasts

- Supports RSS feeds of new media

- Support multiple podcasts like campus meetings

- Statistics

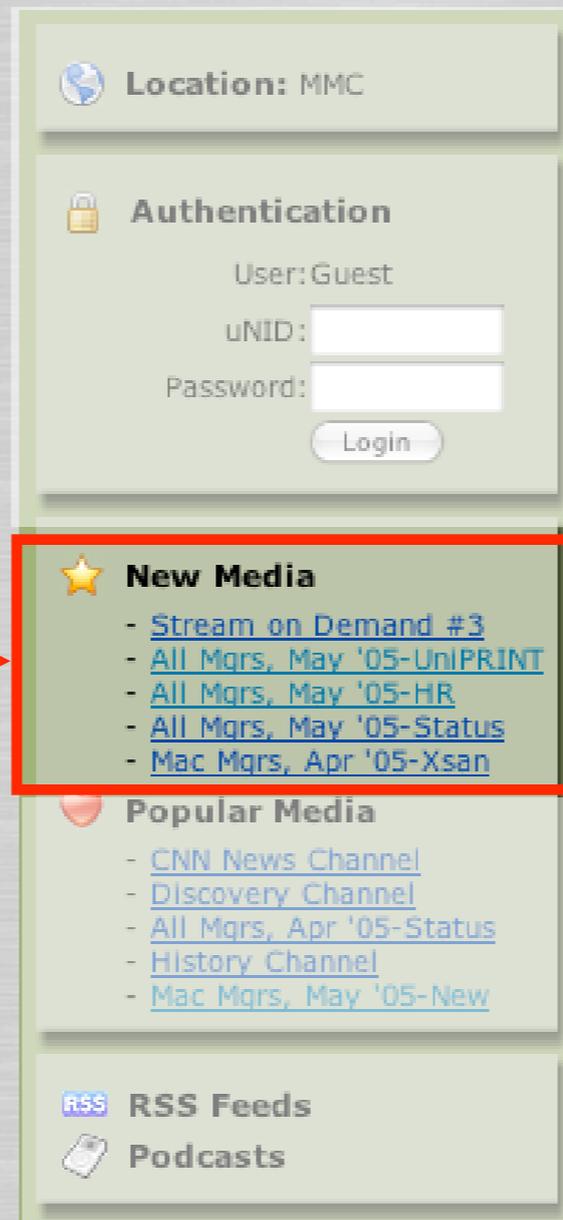
- Tracks media utilization

- User info (IP, uNID, Ect.)

- Much more..



History



Location: MMC

Authentication

User: Guest

uNID:

Password:

Login

★ New Media

- [Stream on Demand #3](#)
- [All Mqrs, May '05-UniPRINT](#)
- [All Mqrs, May '05-HR](#)
- [All Mqrs, May '05-Status](#)
- [Mac Mqrs, Apr '05-Xsan](#)

Popular Media

- [CNN News Channel](#)
- [Discovery Channel](#)
- [All Mqrs, Apr '05-Status](#)
- [History Channel](#)
- [Mac Mqrs, May '05-New](#)

RSS RSS Feeds

Podcasts

New Media →



History



Location: MMC

Authentication

User: Guest

uNID:

Password:

Login

New Media

- [Stream on Demand #3](#)
- [All Mqrs, May '05-UniPRINT](#)
- [All Mqrs, May '05-HR](#)
- [All Mqrs, May '05-Status](#)
- [Mac Mqrs, Apr '05-Xsan](#)

Popular Media

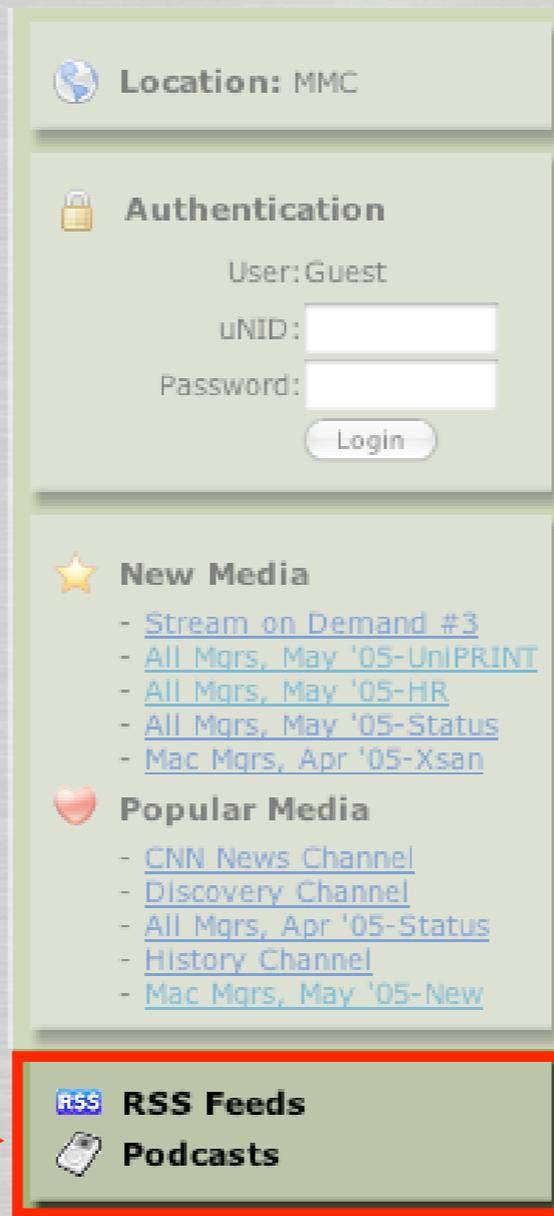
- [CNN News Channel](#)
- [Discovery Channel](#)
- [All Mqrs, Apr '05-Status](#)
- [History Channel](#)
- [Mac Mqrs, May '05-New](#)

RSS Feeds

Podcasts



History



The screenshot shows a web interface with a light green background. It is divided into several sections:

- Location:** MMC, indicated by a globe icon.
- Authentication:** Includes a lock icon, the text "User: Guest", and input fields for "uNID:" and "Password:". A "Login" button is located below the password field.
- New Media:** Marked with a star icon, it lists several media items with blue links:
 - [Stream on Demand #3](#)
 - [All Mqrs, May '05-UniPRINT](#)
 - [All Mqrs, May '05-HR](#)
 - [All Mqrs, May '05-Status](#)
 - [Mac Mqrs, Apr '05-Xsan](#)
- Popular Media:** Marked with a heart icon, it lists several media items with blue links:
 - [CNN News Channel](#)
 - [Discovery Channel](#)
 - [All Mqrs, Apr '05-Status](#)
 - [History Channel](#)
 - [Mac Mqrs, May '05-New](#)
- RSS Feeds & Podcasts:** This section is highlighted with a red border and contains an RSS icon, the text "RSS Feeds", and a mobile phone icon with the text "Podcasts".

RSS & Podcasts →

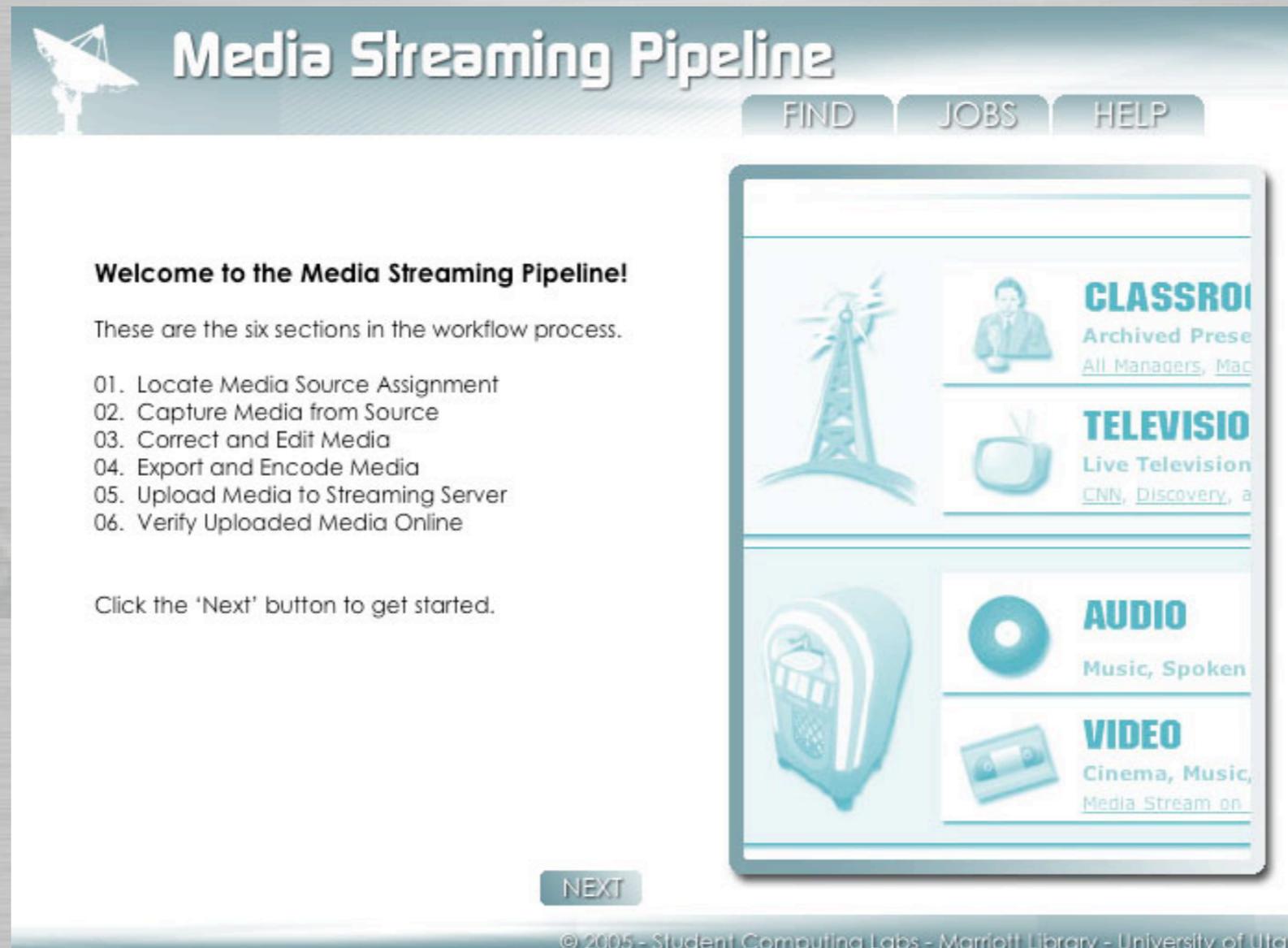


History

- Added Media Workflow Interface
 - Manager
 - Allows manager assign/control source
 - Assign ACLs, etc.
 - Editor/Encoder
 - Gives step-by-step instruction
 - Hopefully, will allow to do our “real” job
 - No more ingestion, editing, encoding, etc.



History



The screenshot shows the 'Media Streaming Pipeline' website. At the top, there is a navigation bar with 'FIND', 'JOBS', and 'HELP' buttons. Below the navigation bar, the main content area is divided into two columns. The left column contains a welcome message and a list of six steps in the workflow process. The right column features a large 'NEXT' button and a list of media categories: CLASSROOM, TELEVISION, AUDIO, and VIDEO. Each category has an icon and a brief description. The bottom of the page includes a copyright notice for 2005, attributed to Student Computing Labs at the Marriott Library, University of Utah.

Media Streaming Pipeline

FIND JOBS HELP

Welcome to the Media Streaming Pipeline!

These are the six sections in the workflow process.

01. Locate Media Source Assignment
02. Capture Media from Source
03. Correct and Edit Media
04. Export and Encode Media
05. Upload Media to Streaming Server
06. Verify Uploaded Media Online

Click the 'Next' button to get started.

CLASSROOM
Archived Presentations
[All Managers](#), [Mac](#)

TELEVISION
Live Television
[CNN](#), [Discovery](#), [a](#)

AUDIO
Music, Spoken

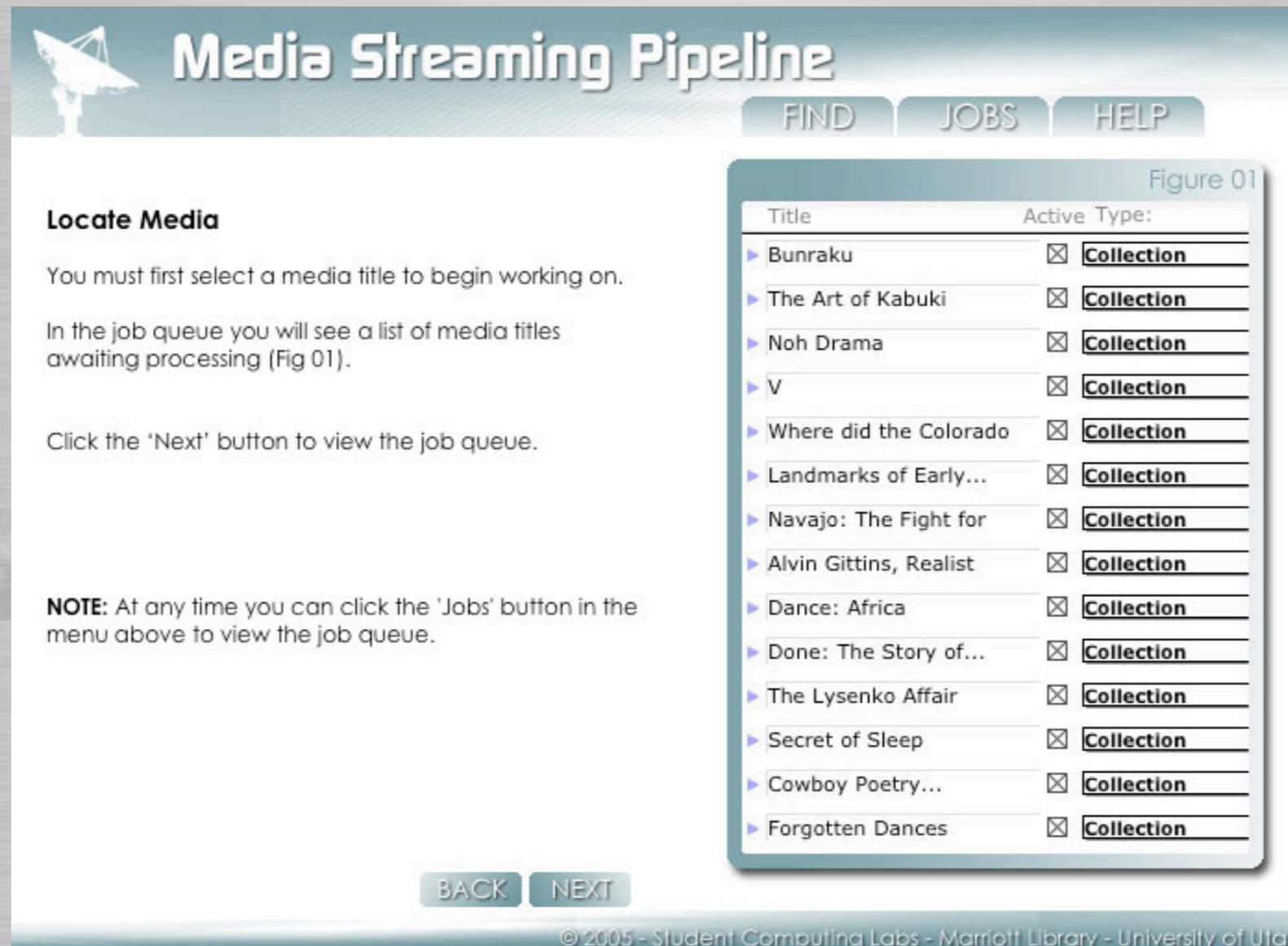
VIDEO
Cinema, Music,
[Media Stream on](#)

NEXT

© 2005 - Student Computing Labs - Marriott Library - University of Utah



History



Media Streaming Pipeline

FIND JOBS HELP

Locate Media

You must first select a media title to begin working on.

In the job queue you will see a list of media titles awaiting processing (Fig 01).

Click the 'Next' button to view the job queue.

NOTE: At any time you can click the 'Jobs' button in the menu above to view the job queue.

BACK NEXT

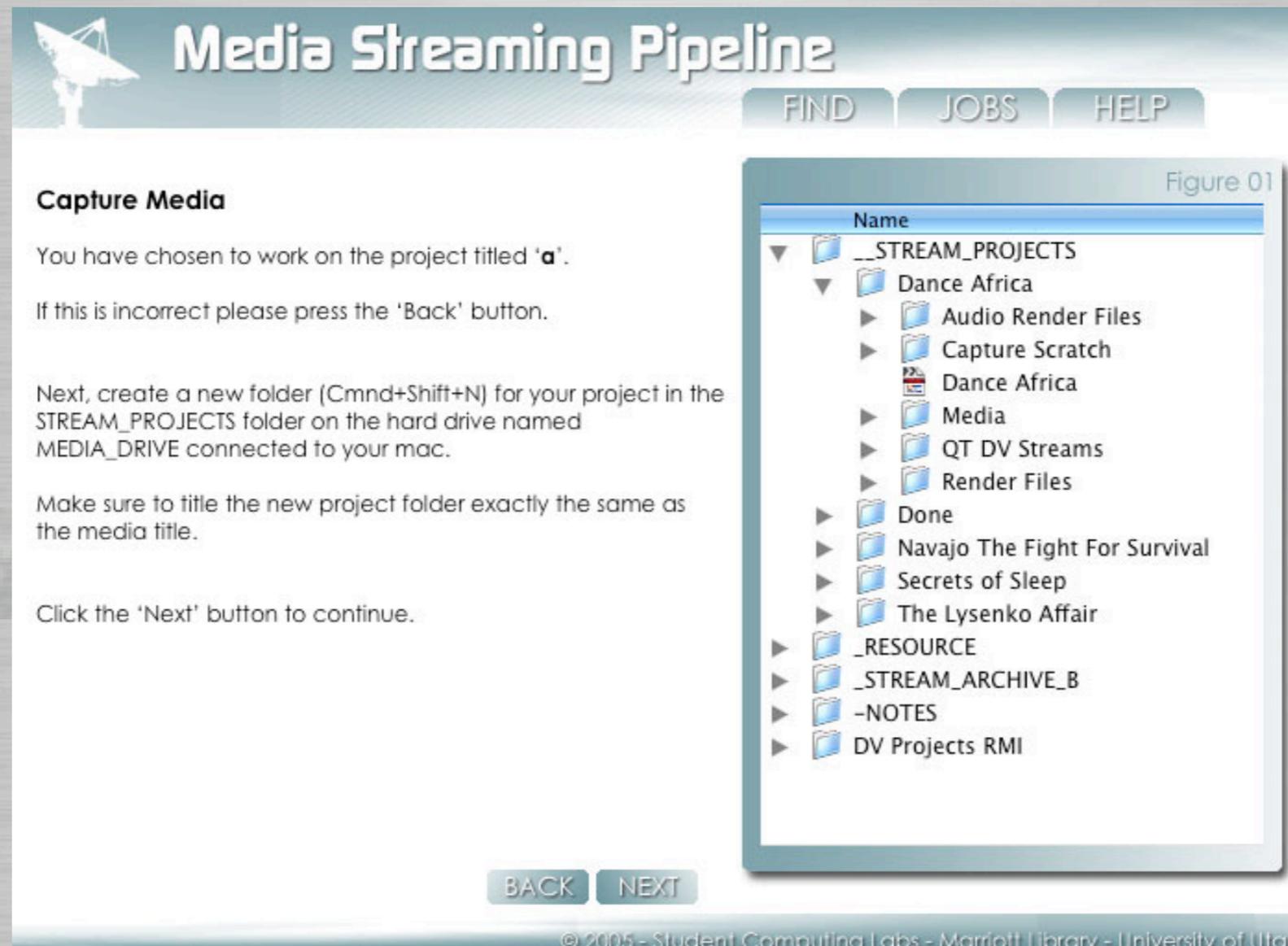
© 2005 - Student Computing Labs - Marriott Library - University of Utah

Figure 01

Title	Active	Type:
▶ Bunraku	<input checked="" type="checkbox"/>	Collection
▶ The Art of Kabuki	<input checked="" type="checkbox"/>	Collection
▶ Noh Drama	<input checked="" type="checkbox"/>	Collection
▶ V	<input checked="" type="checkbox"/>	Collection
▶ Where did the Colorado	<input checked="" type="checkbox"/>	Collection
▶ Landmarks of Early...	<input checked="" type="checkbox"/>	Collection
▶ Navajo: The Fight for	<input checked="" type="checkbox"/>	Collection
▶ Alvin Gittins, Realist	<input checked="" type="checkbox"/>	Collection
▶ Dance: Africa	<input checked="" type="checkbox"/>	Collection
▶ Done: The Story of...	<input checked="" type="checkbox"/>	Collection
▶ The Lysenko Affair	<input checked="" type="checkbox"/>	Collection
▶ Secret of Sleep	<input checked="" type="checkbox"/>	Collection
▶ Cowboy Poetry...	<input checked="" type="checkbox"/>	Collection
▶ Forgotten Dances	<input checked="" type="checkbox"/>	Collection



History



Media Streaming Pipeline

FIND JOBS HELP

Capture Media

You have chosen to work on the project titled 'a'.

If this is incorrect please press the 'Back' button.

Next, create a new folder (Cmnd+Shift+N) for your project in the STREAM_PROJECTS folder on the hard drive named MEDIA_DRIVE connected to your mac.

Make sure to title the new project folder exactly the same as the media title.

Click the 'Next' button to continue.

BACK NEXT

Figure 01

Name
▼ __STREAM_PROJECTS
▼ Dance Africa
▶ Audio Render Files
▶ Capture Scratch
▶ Dance Africa
▶ Media
▶ QT DV Streams
▶ Render Files
▶ Done
▶ Navajo The Fight For Survival
▶ Secrets of Sleep
▶ The Lysenko Affair
▶ _RESOURCE
▶ _STREAM_ARCHIVE_B
▶ -NOTES
▶ DV Projects RMI

© 2005 - Student Computing Labs - Marriott Library - University of Utah



History

 **Media Streaming Pipeline**

FIND JOBS HELP

Capture Media

Launch Final Cut Pro (Fig 01).

DOCK: General>Final Cut Pro HD

In FCP set the path of the scratch disk to the Project folder that you created in the previous step (Fig 02).

MENU: Final Cut Pro HD>System Settings...

Click the 'Next' button to continue.

BACK NEXT

© 2005 - Student Computing Labs - Marriott Library - University of Utah



Figure 01



Figure 02

Video Capture	Audio Capture	Video Render	Audio Render	Clear	Set...
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Clear	Set...
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Clear	Set...
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Clear	Set...
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Clear	Set...

