Videotorium: video sharing for research and education
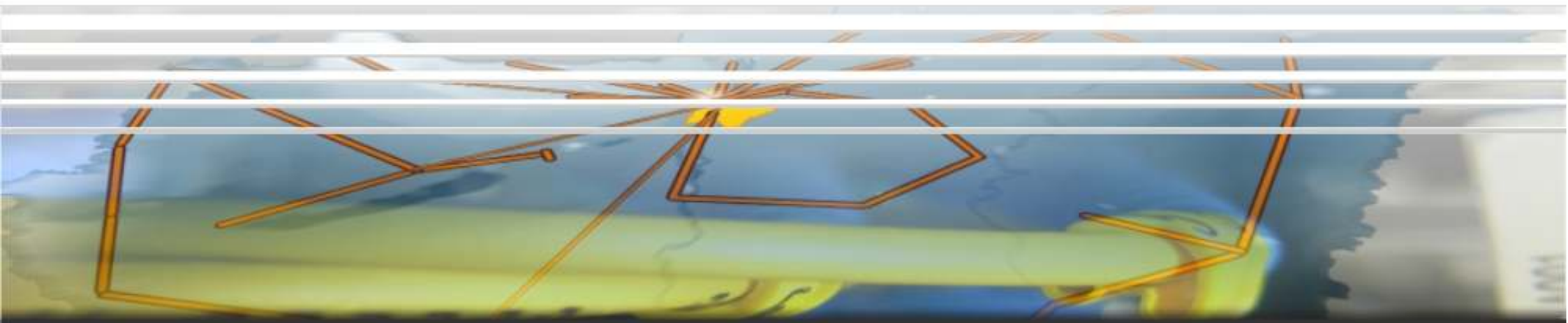
András Kovács

NIIF/HUNGARNET

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History: NIIF Video-on-Demand (2003-2010)

- VoD basics: http://vod.niif.hu
  - Original goal: simple repository of NIIF/HUNGARNET recorded events.
    - Conferences
    - Seminars
    - Scientific events, experiments, etc.
  - Open access materials (99%)
  - Audio/video and sychronized slides
- VoD in numbers:
  - Currently ~2,000 recordings (~1,000 hours!)
  - 30% in English, rest is HU
  - 3-4000 vistors/month, >1TB download
  - Lectures by Nobel-laureates, famous scientists, etc.
- Technology:
  - Basic/outdated website
  - No upload feature: slow growth of content
  - Very slow development (spare-time)
  - Minimal metadata features
  - Archive: Windows Media → Flash/VP6
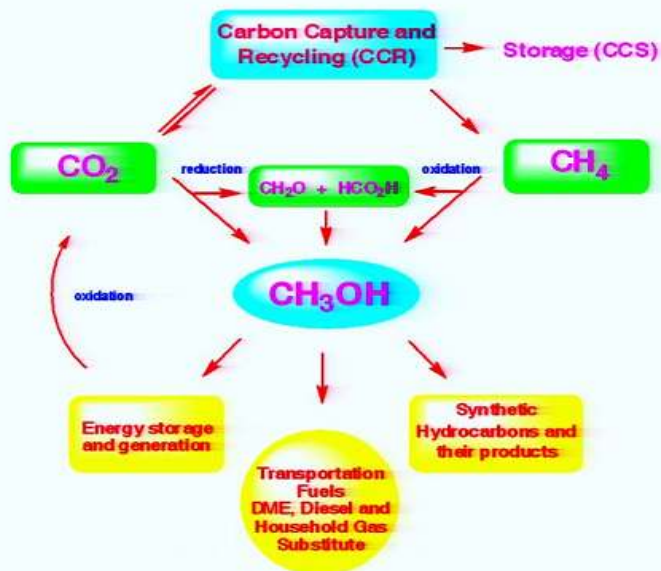 - Live: Windows Media

Videotorium: video sharing for R&E

Új Magyarország
FEJLESZTÉSI TERV

Video-on-Demand archive

Videotorium: video sharing for R&E

Video-on-Demand archive example

Videotorium: video sharing for R&E

Motivation…

- Institutions/organizations:
  - Streaming/recording (conferences, lectures, etc.)
  - No local repository:
    - Recorded material „must" be published
    - Expertise is not available
    - Scalable repository is a demanding service/development
    - Small institutions?
    - Many manual addition to VoD (tiring)
  - YouTube:
    - A tendency to use YouTube to share R&E recordings
    - Synchronizing slides is not possible
    - Metadata features are limited → search?
  - Know-how
- Others:
  - Keep valuable asset of 1,000 hours of old recordings
  - Professional web based presentation
  - Meet scientific retrieval requirements
  - R&E multimedia metadata aggregator in Hungary!

Videotorium: video sharing for R&E

The project
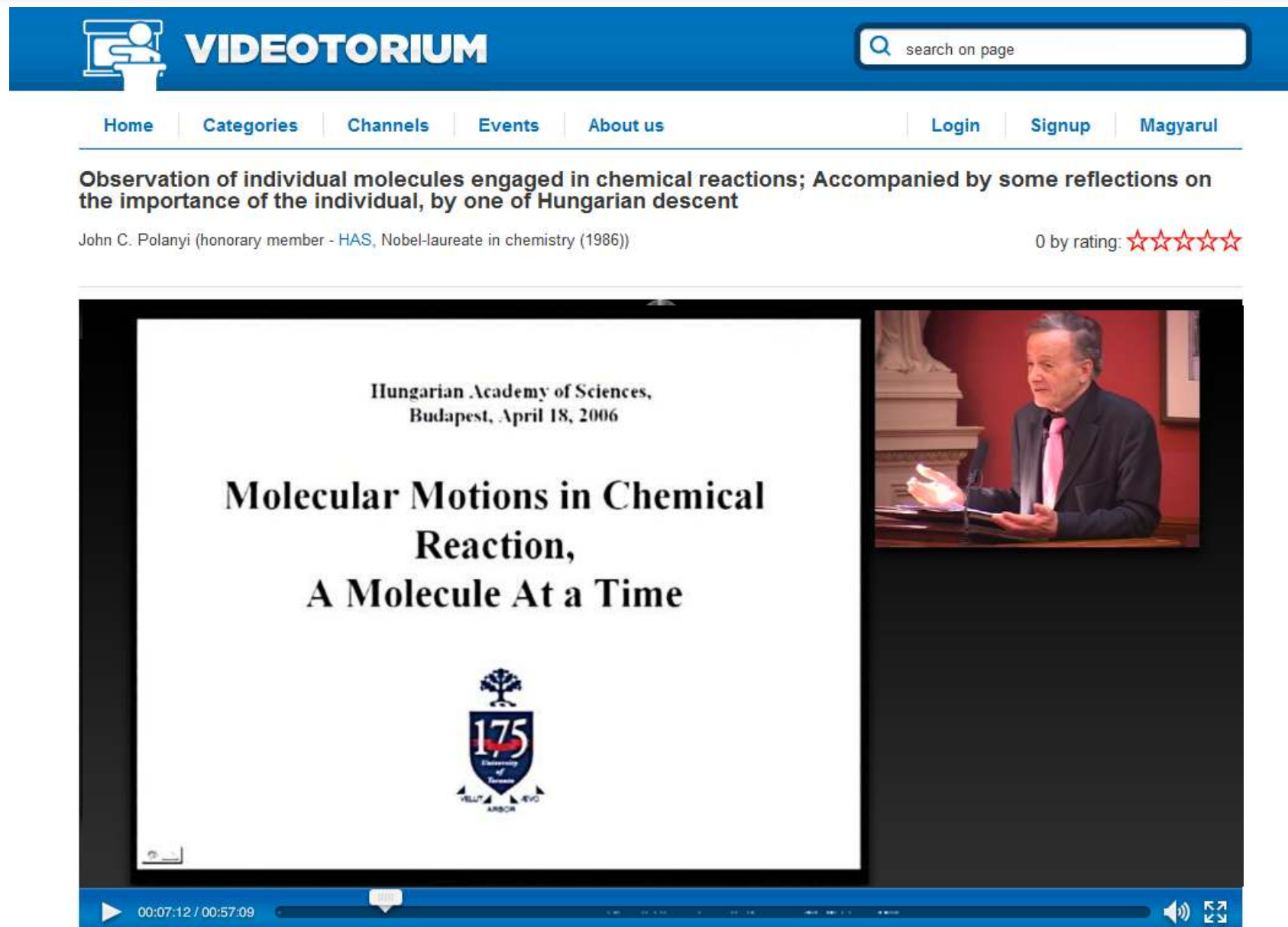
- Videotorium: http://www.videotorium.hu/
- Supported by some EU funds through a local application:
  - As (a small) part of TÁMOP 4.1.3
- Portal:
  - Launched: June 2010
  - VoD material is being converted
  - Upload feature: in 1-2 weeks
- Pilot phase: May-August 2010
  - Feedback from organizations
  - Functional revision, new features
- Project finishes: October 2010
  - Stable service
  - Vision for future developments
  - Metadata aggregation

Videotorium: video sharing for R&E

Videotorium overview

- Supported media:
  - Audio only, audio/video (including HD)
  - Synchronized slides
  - Attached documents (doc, pdf, xls, etc.)
- Special player:
  - Combining audio/video and slides
  - Dynamic resize and fullscreen view
  - Embed to external webpages (whole/part)
  - Handle chapters, list of slides, etc.
- Other features:
  - Recommended content (popular, related, etc.)
  - Search, advanced search
  - Comments, rating and sharing
  - Feedback on content (abuse, technical problems, etc.)
  - Multi language (site + media)
- Implementation: Linux, PHP, Flash, JavaScript
  - Open software + standards where possible
  - 100% multiplatform, multibrowser (FF, Opera, IE, Safari, Chrome, etc.)

Videotorium player

Videotorium: video sharing for R&E

Upload/share

- Uploaders: requires registration
  - Lecturers, researchers, public collection users
  - Students (carefully!)
  - Other non-profit application
  - Preference for AAI authentication
- Steps of sharing:
  1. Upload media, presentation and attached files
  2. Automatic conversion
  3. Visual editing:
     - Virtual begin/end mark
     - Slide synchronization
  4. Metadata description:
     - Titles, contributors, etc.
  5. Publishing options:
     - Rights
     - Drop into a channel (event)

Create new recording

Upload media and other files

Automatic conversion

Visual edit

Metadata description

Publishing options

Choose channel

Ready

Videotorium: video sharing for R&E
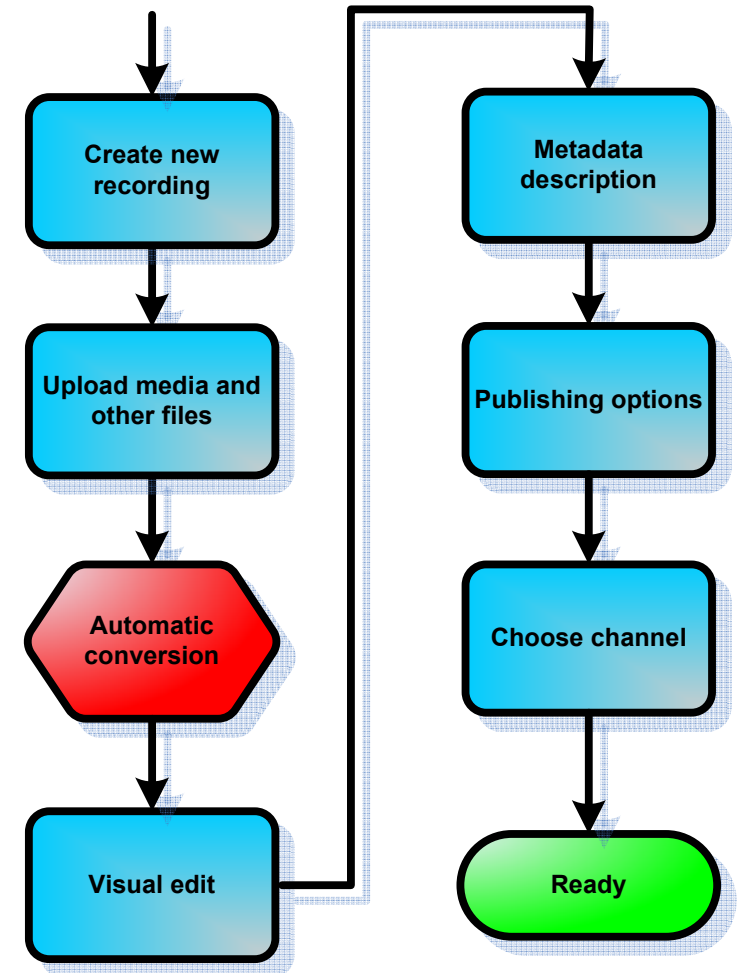
Automatic conversion

- Multi-language support: language variants (original/english)
  - E.g. with translator's audio track
- After conversion:
  - Audio-only version:
    - Off-line listening (e.g. mp3 player)
    - Narrowband internet connection, blind people, etc.
  - Flash audio/video versions: H.264
    - Normal quality (fit to 640x360 16:9 bounding box)
    - High quality (fit to 1024x576 16:9 BB)
    - Visualization 720p in web browser is problematic (too big, performance issues)
  - Slides: converted to still pics, full text indexed (search!)
  - Video thumbnails: speaker key images, recording & channel thumb
  - Attached documents: full text indexation (later)
- Supported input formats:
  - Media: avi, mpeg-1/2/4, flv, f4v, m4v, mp3, wma/wmv, etc.
  - Slides: ppt, odp/sxi, pdf
  - Tools used: ffmpeg, mplayer, ghostscript, pdftotext, OpenOffice, etc.

Visual editor

- Special flash application:
  - Pre-publication visual check
  - Synchronize converted slides to video
  - Slides on timeline
  - Add/edit slide titles and chapters
  - Virtual cut (begin/end markers)

Videotorium: video sharing for R&E

Metadata

- Target audience: diverse needs
  - User: accurate search
  - Uploader: no expertise in metadata
- Goal:
  - Avoid too much details ↔ accurate search?
  - Understandable metadata elements and clean user interfaces (!)
  - Clear, well-defined search interface
- Multi language: essential
  - Original language (anything)
  - Optional English description
- Metaadat basics: „description of data"
  - Biblographical: descriptive records (e.g. recordings)
  - Authority records (e.g. authors)
  - Rights of publication
  - Technical (e.g. format, size)

Metaadat modell: levels of description

- Basic metadata: **partly mandatory**
  - Base: Europeana Semantic Element DC
  - Entities: persons, events, organizations/bodies, recordings
- Science field classification: **mandatory**
  - Ortelius thesaurus (2 languages: en/hu)
  - EU: research project classification (11 languages)
  - Local use: classify national projects
    - Developed and maintained in hu/en
  - Hierarchic: 2500 items (!), upper levels used
- Content description: **optional**
  - Library of Congress Subject Heading (LCSH) thesaurus
  - Almost a standard with specified relations
  - Adapted to hu: University of Debrecen Univ. & National Library
  - 2 language solution
- Free descriptors: **labels/tags**

Videotorium: video sharing for R&E

Metaadat modell: levels of description

- Persons:
    - Name, key picture (identification)
    - Science field, profession
    - Jobs, organizations, scientific awards, etc.
- Events:
    - Title, description
    - Location
    - Contributors: organizer(s), broadcaster(s), etc.
- Organizations/bodies:
    - Name, URL
    - Location
- Recordings:
    - Title, subtitle, description
    - Language
    - List of contributors/creators, uploader/owner
    - Location, date of recording
    - Genre/type
    - Subject: science field classification, LCSH labels, tags
    - Event (channel)
    - Document length
    - Technical metadata
- Others: qualifiers and code lists help on user interface

**Videotorium: video sharing for R&E**

Rights + channels

- Type of publication:
  - Public
  - Requires registration
  - Group of users/institutions
  - Limited to a timeframe
- Additional settings:
  - Embeddable on external pages?
  - Downloadable?
- Choosing a channel:
  - Channel: event, recordings, view
  - Hierarchical
- Other settings:
  - Video: left/right

Simple channel

Recording1	Recording2	. . .	RecordingN

Metadata description

Hierarchical channel

Channel1	Channel2	. . .	ChannelN

Metadata description

Channel

R1	R2	. . .	Rn

Metadata description

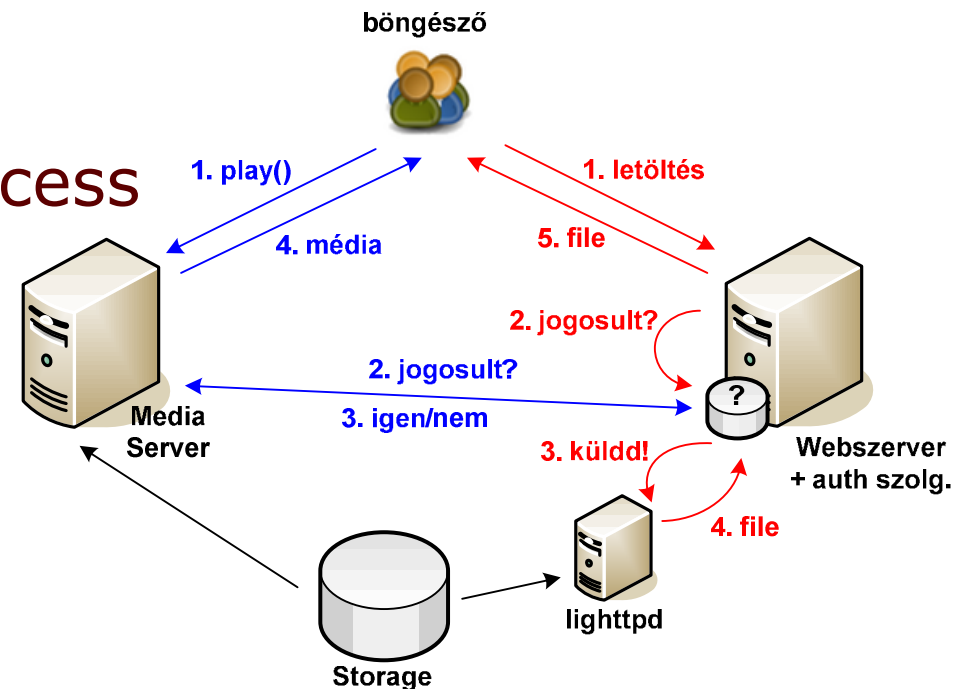**Videotorium: video sharing for R&E**
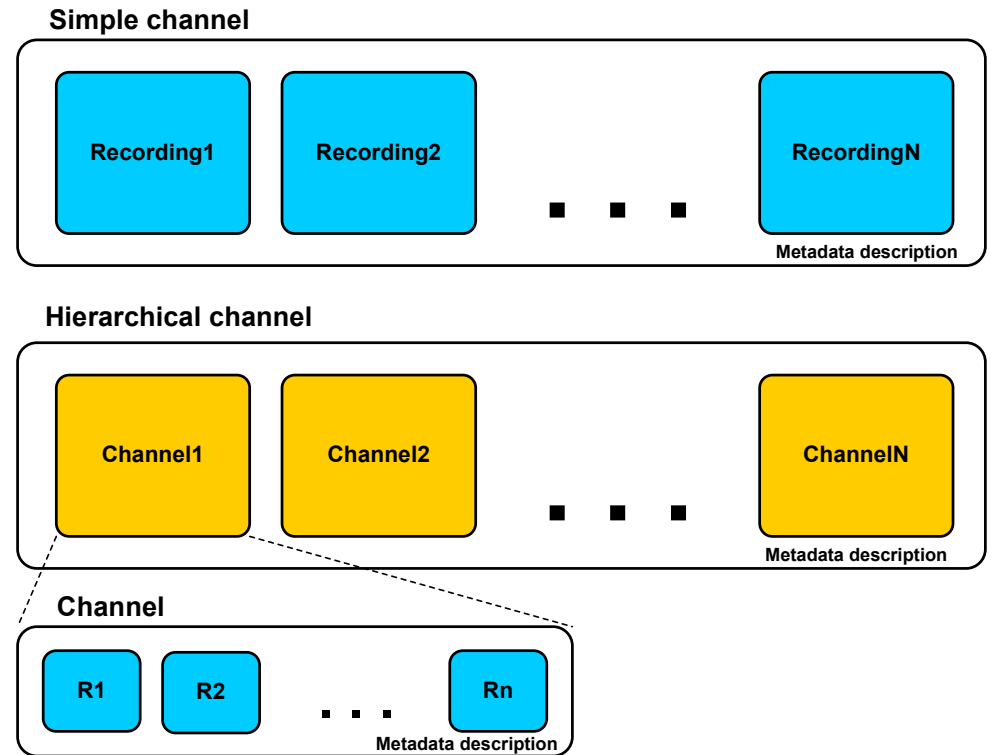
Authentication

- Technology:
  - eduID (=Shibboleth) → preferred!
  - Or: username/pass
- User statuses:
  - Registered user
  - Institutional uploader
  - Institutional editor (later)
- eduID identification:
  1. Web service provider (SP)
  2. Home institution authenticates (IdP)
  3. Back to web service provider
  - User logged in for session
- eduID advantages:
  - Home institution authenticates
  - Institution decide what personal data is provided
  - Privacy OK
  - Groups (staff, student, …) → instant uploader
  - Later: authorization by institutions (URN based)

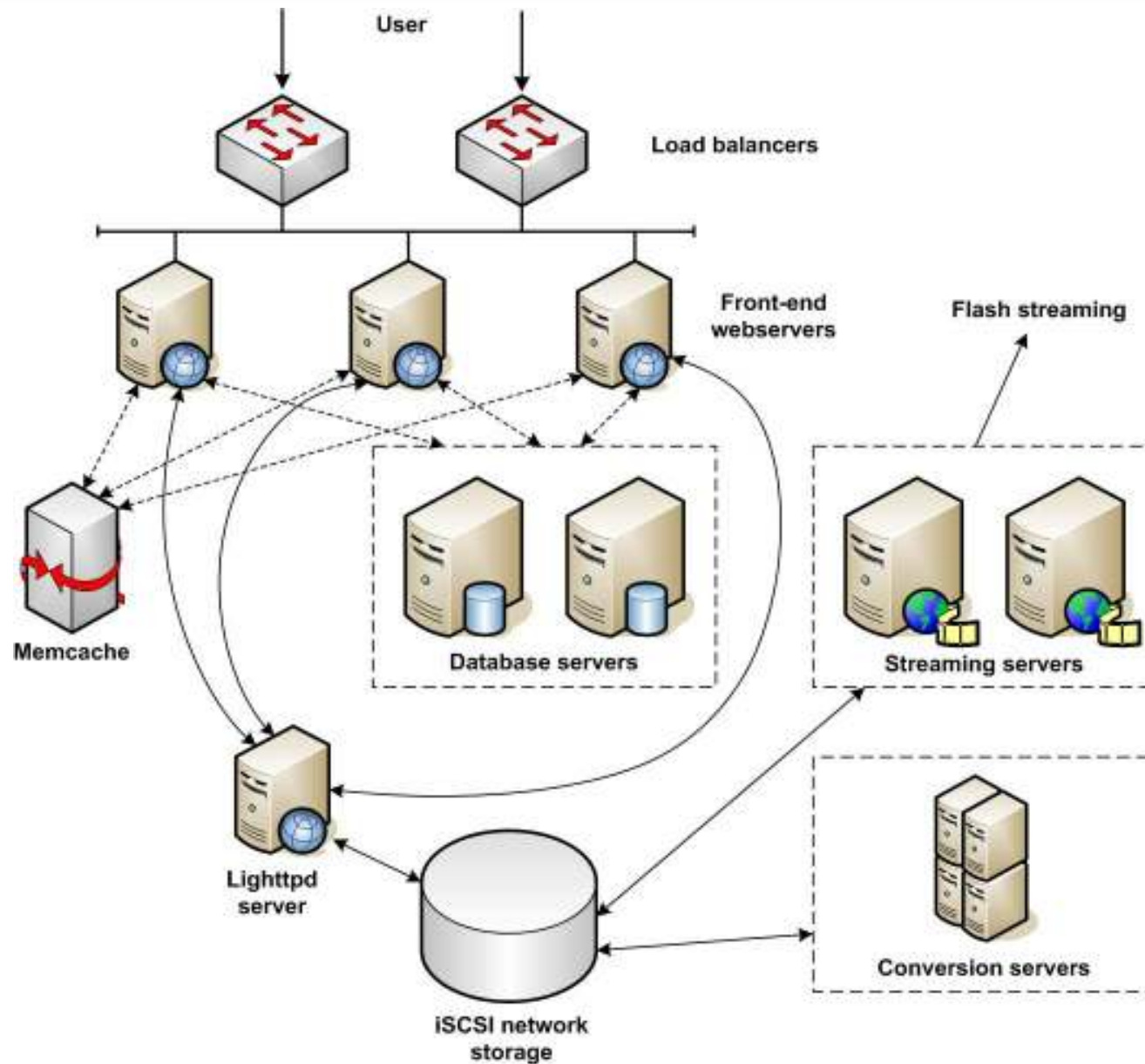**Videotorium: video sharing for R&E**
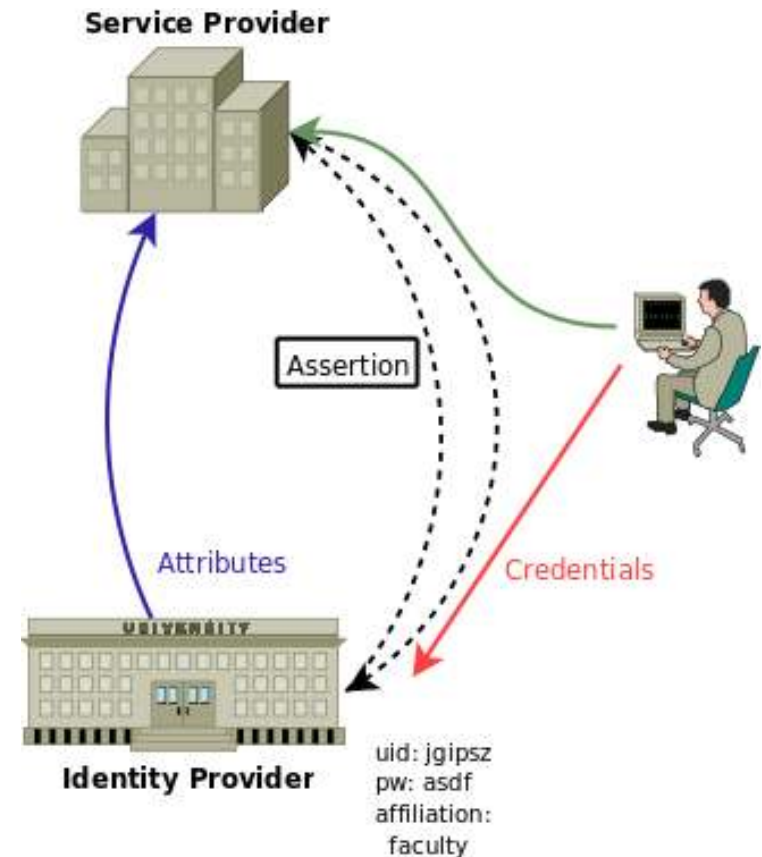
Authentication II.

- Problem: HTTP and media server distinct entities
- Videotorium solution:
  - Wowza Media Server + auth plugin
  - Apache + auth. service (AS)
  - Media server ask AS weather to play/download
  - AS authorize all requests
  - Files are serviced by lighttpd
 - Apache: no direct storage access

böngésző

1. play()   1. letöltés

4. média   5. file

2. jogosult?

2. jogosult?

3. igen/nem

3. küldd!

4. file

Media Server

Webszerver + auth szolg.

lighttpd

Storage

System architecture

Videotorium: video sharing for R&E

Metadata aggregation

- OAI-PMH metaadat harvest
- Aggregation point for institutional repositories
- Feed metadata to international aggr. points:
  - Pl. Europeana, EUscreen, etc.

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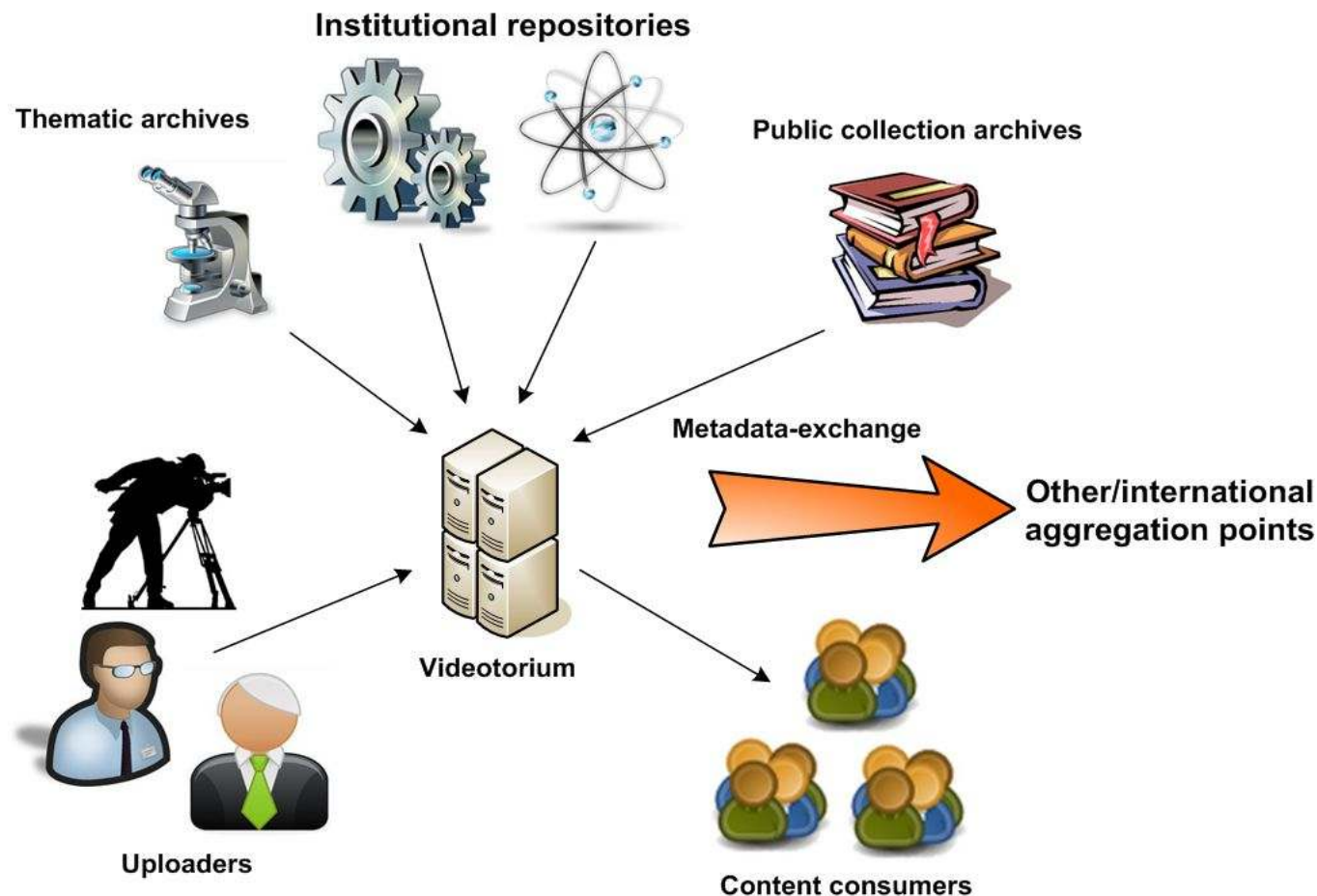
Thank you!

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http://www.videotorium.hu/