Yet Another Approach for Archiving and Playback of Access Grid Sessions

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VIRGIL - Virtual Meeting Archive

- The problem we were trying to solve
- The new problems solving this caused
- Pragmatic solutions on a tight budget
- Room for improvement
Some Background: The AccessGrid

- Low cost video conferencing
- Uses the Internet and RTP* for data and control delivery
  - Singlecast or Multicast
- Based on UCL utilities “vic” and “rat”

* Real Time Protocol
Recording AccessGrid Sessions

- Excellent, mature tools for recording sessions
  - AGVCR
  - Voyager Multimedia server
  - MBone VCR on Demand
  - Memetic
- Feature-rich, heavyweight
VIRGIL Objectives

- Simplicity, simplicity, simplicity
  - Thin client for search, retrieve, and play
  - Simplified archiving and indexing
  - Recorder host platform neutral
  - Automatic metadata creation
First Plan

- In real-time:
  - Use the Rat’s ability to write audio to disk (wav)
  - Modify Vic to capture frames and build them into a matrix in a common format (mpeg)
- Run a post processing step to combine audio and video into a “movie” file (mov, avi, etc)
- Create metadata describing session.
First Problem(s)

- Startup delays for Vic and Rat cause lip-sync problem
- Slow build-up of 8x8 pixel blocks
- Manual metadata creation painful
Solutions

● 8x8 build-up:
  – Allow feeds to stabilize before starting recording
    ● New problem: requires fine grained control of Vic

● Lip sync:
  – Fixed (partially) by the 8x8 “fix”
    ● New problem: requires fine grained control of Rat

● Metadata:
  – Capture metadata stream from RTP streams
    ● Made possible as through Vic and Rat mods
Approach Summary

- Add control layer to Vic and Rat for start, stop, pause control of recordings
- Build VCR-like control program to control Vic and Rat, and hide the nastiness of the movie creation process (using “ffmpeg” utility)
- Grab cached metadata from the (modified) Vic and Rat at movie creation time
Session Metadata

● Comprised of
  – Data supplied by recorder
    ● Time and date stamp, recording duration
    ● AG URLs used
    ● Optional operator supplied data (title, subject, minutes)
  – Data captured from RTP streams
    ● Participant identification (name, email, location, telephone)
    ● Software versions, operating system, login ID
The Vic/Rat Modification Package
(available by download)

- Minimal change footprint in Vic and Rat code
  - Rat: One ‘C’ statement
  - Vic: Two ‘C++’ statements

- Automated “installer” (perl) to:
  - Insert changes to UCL source code files
  - Make changes to (generated) UCL ‘Makefiles’
  - Copy new source files into the right places
  - Option to remove changes
A Searchable Repository

- PHP-based web “portal” provides:
  - Upload movie and associated metadata files
  - Create extra RDF metadata to facilitate searching
  - Allow view and edit of metadata prior to ingest of movie, still snapshot, and all metadata to an institutional Fedora 2.2 Object repository
  - Search on metadata with summary results
  - Retrieve movie and format metadata for viewing
  - In the client browser
Validation Complete

Please review and amend metadata as required, then press the Commit button to complete the upload.

Metadata:

- **Title:** Virgil session 14229
- **Subject:**
- **Date:** 2006-11-11T01:57:49Z
- **Duration:** 00:00:26
- **Language:** en
- **Agenda:** Ron introduces the Virgil Virtual Video Recorder

Participants:

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<td>University of Queensland St Lucia</td>
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<td>0:00:26</td>
<td>UQ St Lucia</td>
<td>+61 7 33654534</td>
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Search Tips

- All search fields are optional. Leave all blank to display all entries.
- The results are filtered by AND logic of supplied terms. The selection method for the Key Words and Participants fields is case-insensitive "contains". The Key Words are matched against the Title and Agenda metadata.
- Dates are stored in UTC time (once called Greenwich Mean Time, or "Zulu" time). If no time component is supplied, "From" defaults to one second after midnight; "To" defaults to midnight. Either date may be omitted for "after" or "up to" filtering.
- The results summarize entries matching the search criteria. Click the Title link to view the full record which includes the video snapshot image linked to the actual video file for playback.

The Virgil project is funded by Grangenet.
Search Summary

Search Results

Title: Virgil session 14229
Recorded: 2006-11-11 at 01:57:43Z
Duration: 00:00:25
Participants: Fred Nank, Ron Chernich

Title: Virgil session 14229
Agenda: Demonstration of movie upload
Recorded: 2006-11-11 at 01:57:43Z
Duration: 00:00:25
Participants: Jane Hunter, Ron Chernich

Title: Virgil session 14229
Agenda: Demonstartion of Virgil #3
Recorded: 2006-11-11 at 01:57:43Z
Duration: 00:00:25
Participants: Alex Davies, Ron Chernich

Return to search page

The Virgil project is funded by Grangenet.

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**Search Result**

**Virgil session 19421**

- **Subject:** no data
- **Agenda:** Discuss Wildnet website Decide if migration warranted
- **Minutes:** no data
- **Duration:** 00:03:38
- **Recorded:** 2006-11-18 at 05:18:13Z
  - Host: g710-acer.itee.uq.edu.au, Recorder: vvr.pi v1.2.0
  - Rat URL:
  - Vic URL:

**Participants:**

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<td>Ronald Schroeter</td>
<td>adavies@130.102.66.110</td>
<td><a href="mailto:ronalds@gmail.com">ronalds@gmail.com</a></td>
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<td>Michael</td>
<td>xchristian@130.102.66.54</td>
<td><a href="mailto:micky@itee.uq.edu.au">micky@itee.uq.edu.au</a></td>
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<td>True</td>
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<td>Alex Davies</td>
<td>adavies@172.19.96.144</td>
<td><a href="mailto:alexdavies@gmail.com">alexdavies@gmail.com</a></td>
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<td>UQ StLucia</td>
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The Virgil project is funded by [GrangeNet](https://www.grangenet.org/).
Sample Movie
Problems and Issues

- Dependencies for build
- Environment configuration not trivial
- Dead Rats and other delicate creatures
- Very large movie files
Outcomes

● A practical framework for making managed versions of Vic and Rat
  - Only as robust as the tools themselves
  - Validated under Linux, but OS-X and Win32 should work
● A VCR for recording AccessGrid sessions
  - Poor error recovery (dead rat scenario)
  - Stream collected metadata may be misleading unless edited
● A Searchable Repository for sessions
  - Painful to configure (Fedora, Tomcat, Apache, PHP, etc)
  - Prototype! (scalability, usability, etc)
  - Metadata still (always?) requires operator intervention
Source Availability

  - Projects
    - Virgil
      - Downloads
        - virgil.tar.gz
        - virgil-repos.tar.gz
Thanks

● Colleagues
  – Jane Hunter jane@itee.uq.edu.au
  – Alex Davies
  – Stephen Jeffery

● Sponsors
  – Grangenet (Grid And Next GEneration NETwork)
  – Australian Broadband Research Network
Questions?

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- jane@itee.uq.edu.au