An Enhanced Shared Presentation Tool for the Access Grid

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Background

- Developed Enhanced Shared Browser (2006)
- Developed Enhanced Shared Presentation Tool (2007)
Rationale

- Online collaboration tools are being increasingly used in health/medical research and training.
- The ability to share applications is crucial in distance learning and remote collaboration in medical informatics.
- Current presentation tool and shared browser only synchronize pages/slides.
  - Presenter & browser cannot display cursor pointing to text/images on slides or from databases.
  - No window resizing, scrolling synchronization.
  - Browser cannot show search strategies (text input, button/link clicks) and synchronize results from online database.
Possible Solutions

- Extend interactivity and functionality of current AG shared presentation tool and shared browser.
- Add screen streaming (scrapping) for AG to show mouse movements, changing of application window and keyboard inputs to remote users.
- Use VNC to provide extended interactivity for sharing presentation tool and browser.
Limitations of Screen Streaming for Sharing Browser (for NLM’s usage)

- Screen streaming transmits screen snapshots at certain frequency and is only one way.
- Refresh rate is not high enough to show mouse movements and other inputs smoothly.

Fig. 1 One-Way Sharing

Fig. 2 Two-Way Sharing

Server/Client Sharing (VNC)  Peer-to-Peer Sharing (AG)
Limitations of VNC for Sharing Applications

- VNC requires giving control of whole computer to remote user in two-way sharing.
- It also requires running a separate VNC server when combined with other video conferencing tools like AG.
- Due to security issue, it is not allowed inside NLM computer networks (and many other security sensitive networks).
NLM’s Requirements for Enhanced Shared Presentation Tool and Shared Browser

- For enhanced shared presentation tool and browser:
  - Display smooth continuous movement of mouse pointer in real time.
  - Allow specific hand over of control to participating end points (versus control by any end point at any time).
  - Maintain synchronization when the application window is resized.

- For enhanced shared browser only:
  - Maintain synchronization when the user scrolls a page in browser window
  - Display interaction within a page in real time:
    - the clicking of links, buttons, and other objects within a page
    - keyboard entry in search boxes and other forms within a page
  - Return the same search results to all end points in a session when online databases are searched.
  - Maintain synchronization for new spawned browser windows.
Current Shared Presentation Tool Demo
Enhanced Shared Presentation Demo
AG Shared Presentation Tool Implementation

Shared Presentation Tool

ppt COM object

Access Grid

wxPython

PowerPoint

wxWindow

Python

Windows Operating System

Mouse Driver

Keyboard Driver
To Trace, Broadcast and Show Mouse Actions Among Collaborating Shared Presentation Tools

- Extend AccessGrid events for broadcasting mouse position and shifting of control.
- Implement local handlers to trace mouse movements, slide information and control actions, and generate events accordingly.
- Implement handlers to handle all these events to show mouse actions, slide and control changes for all AG shared presenters participating in same session.
Enhanced Shared Browser Demo
Current status

- Implemented functionalities
  - For presentation tool:
    - Synchronized mouse pointer.
    - Explicit control hand over.
  - For browser (additional):
    - Synchronization of window resizing & scrolling.
    - Synchronized text input.
    - Return of same search results from online database to all end points.
Future Plans

- Explore use of open source browsers and presentation tools for sharing (FireFox, Open Office).
  - Allow more flexibility to extend functionality.
  - Allow greater control of versioning.

- Implement Linux and Mac versions.
Thanks!

Q & A

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