TellTable: a Server for Collaborative Office Applications

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TellTable is

- Open source project
- For collaborative editing
- Server infrastructure / web browser client
- Lets people all work on a single shared version of a document
- Allows single-machine applications to become shared (e.g., Open Office)

Motivations

- Historical:
  - Mark management in multi-section courses
  - Easier methods to review and check spreadsheet models for “bugs”
- Now:
  - Simpler, less confusing ways to collaborate on office files (documents, spreadsheets, presentations, drawings)

Positioning

- “Enterprise” solutions e.g., Lotus Notes and their infrastructure generally high price and high support demands
- TellTable requires very limited hardware and bandwidth resources

History

1990+: JN wanted to monitor marks and student spreadsheet submissions; Audit trail idea in JN academic papers (with Tony Quon)

c. 2000: StarOffice / OpenOffice

Nov. 2002: JN & Neil Smith discuss spreadsheet audit trail and NS shows proof of concept using OpenOffice change recording infrastructure

Mar. 2003: AA develops practical tools for running OO on a server so change recording is preserved

July 2003: presentation at EuSpRIG Dublin

Oct. 2003: GTEC 2003 / TellTable name and domain

Sep.-Dec. 2003: pilot study, SIE paper

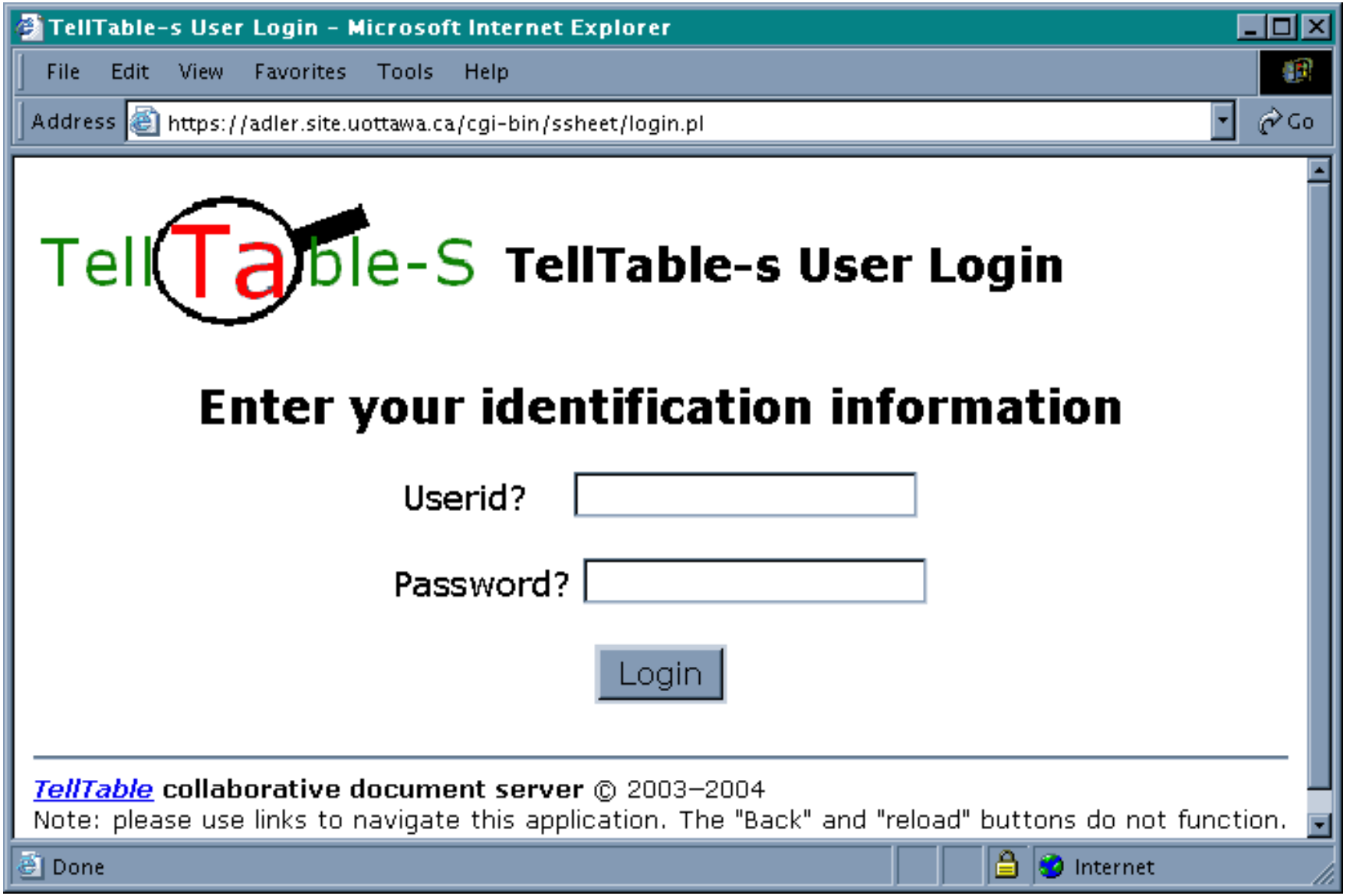
“In principle”

- Run single-machine applications in a server
- Interface the screen/keyboard/mouse via VNC (Virtual Network Computing)

Remote use of an application

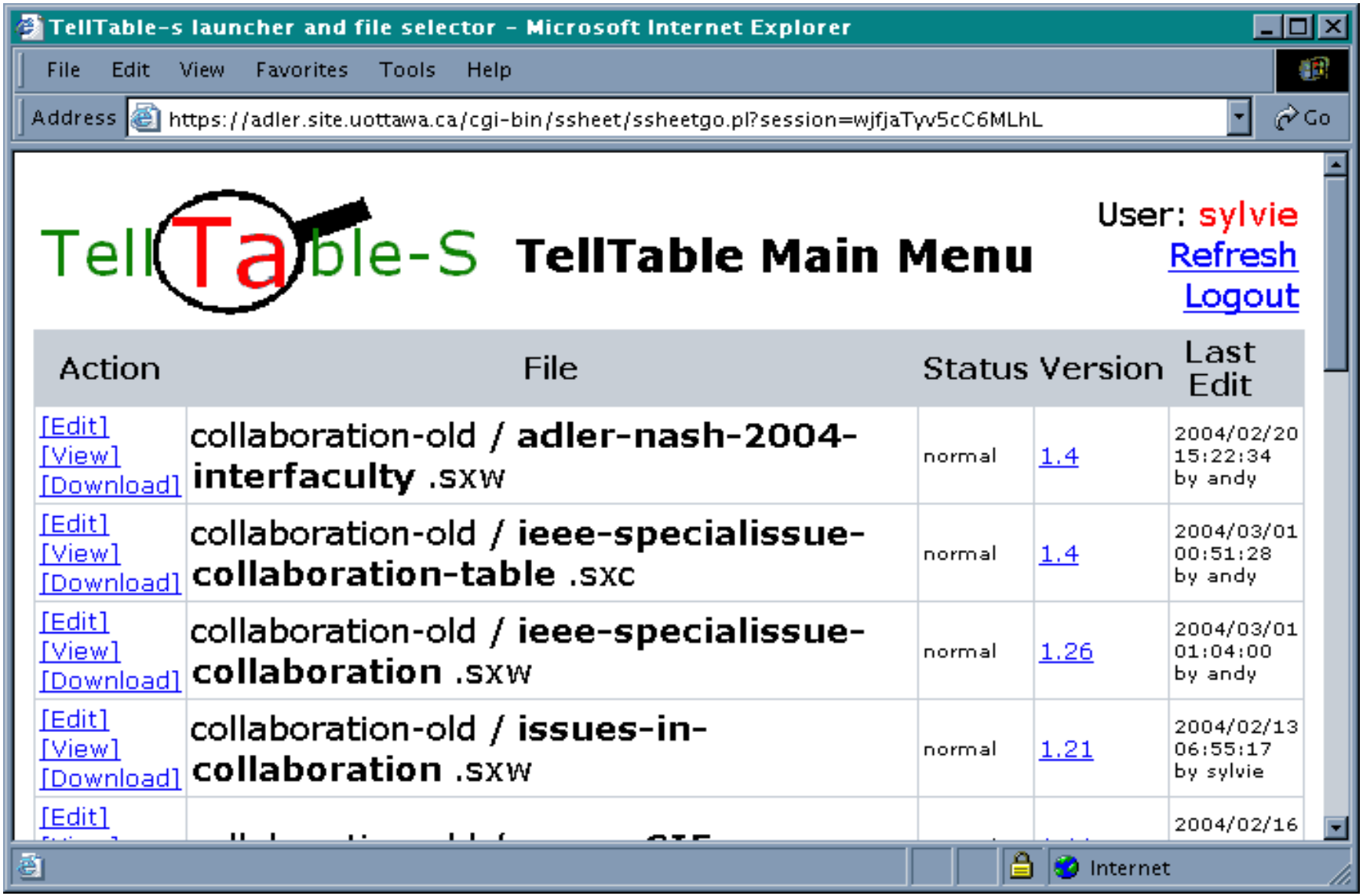
Login

- Java enabled web-browser (Mozilla, IE, Opera, Safari, ...) under Win/Mac/Linux
- Apache-SSL + Java test or “Login” button not displayed
- Standard userid/pw combination
- Launches menu page


TellTable-s User Login - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address https://adler.site.uottawa.ca/cgi-bin/ssheet/login.pl
Go
TellTable-S
TellTable-s User Login
Enter your identification information
Userid?
Password?
Login
TellTable collaborative document server © 2003–2004
Note: please use links to navigate this application. The "Back" and "reload" buttons do not function.
Done
Internet

Menu page

- Files accessible to user listed as links
- Documents in CVS repository
- Admin/CVS class users can access version history and contents
- Basic users edit/view/download
- Admin users have additional tools e.g., audit, eventually other admin functions

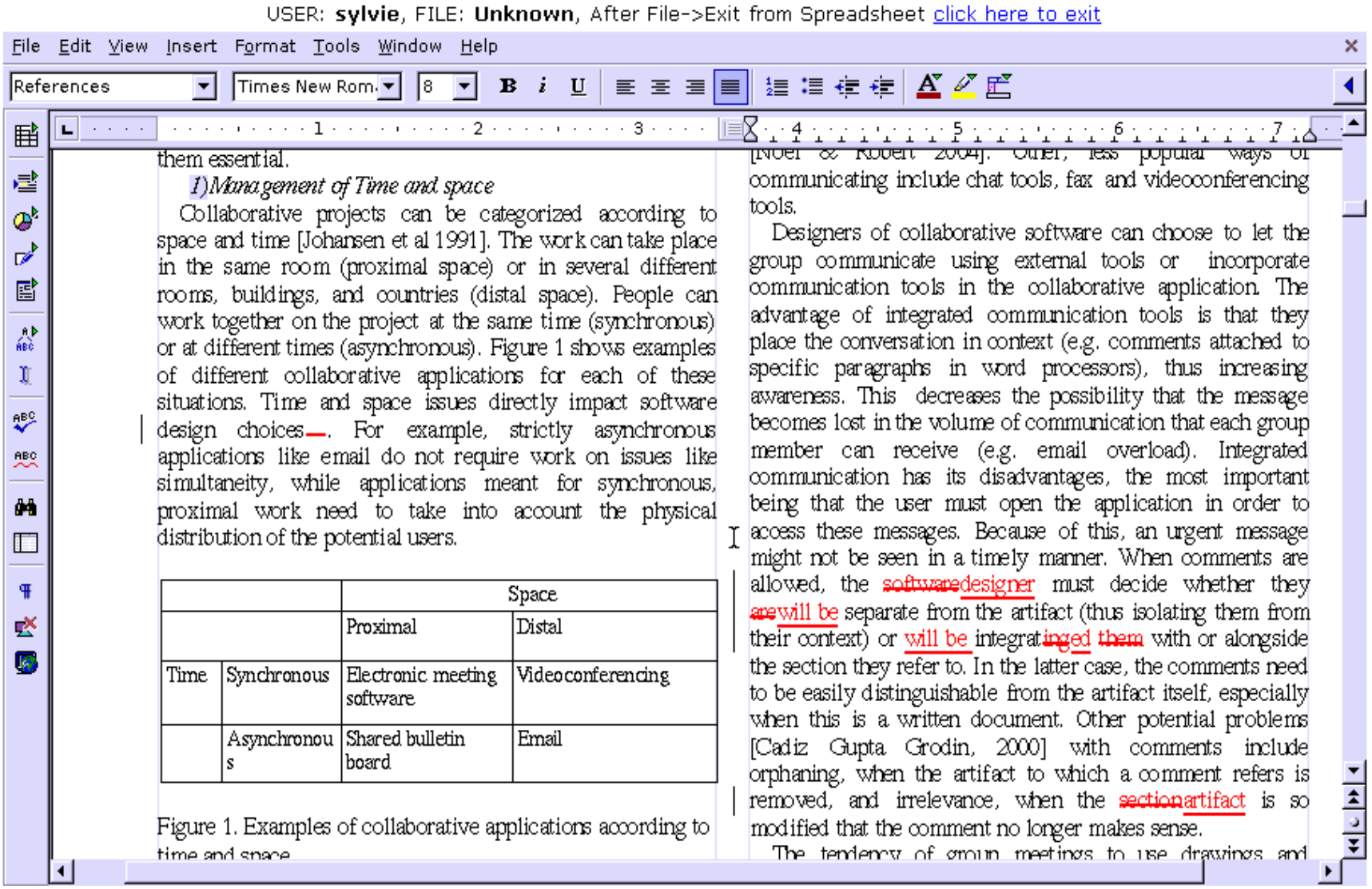

TellTable-s launcher and file selector - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address https://adler.site.uottawa.ca/cgi-bin/ssheet/ssheetgo.pl?session=wjfjaTyv5cC6MLhL
Go
TellTable-S
TellTable Main Menu
User: sylvie
Refresh
Logout
Action File Status Version Last Edit
[Edit] [View] [Download] collaboration-old / adler-nash-2004-interfaculty .sxw normal 1.4 2004/02/20 15:22:34 by andy
[Edit] [View] [Download] collaboration-old / ieee-specialissue-collaboration-table .sxc normal 1.4 2004/03/01 00:51:28 by andy
[Edit] [View] [Download] collaboration-old / ieee-specialissue-collaboration .sxw normal 1.26 2004/03/01 01:04:00 by andy
[Edit] [View] [Download] collaboration-old / issues-in-collaboration .sxw normal 1.21 2004/02/13 06:55:17 by sylvie
[Edit] 2004/02/16
Internet

Launch document

- Opens new web page AND
- Downloads & launches (local) VNC client AND
- Launches application on server (OO) AND
- Gets and locks file from CVS repository to working area AND
- Displays file in application's VNC window

Working

- User sees “standard” application view but in a reduced window
- Copy/paste needs special treatment to work around VNC security
- Some menu items may be removed to force audit trail to be kept (e.g., change recording cannot be turned off)


USER: sylvie, FILE: Unknown, After File->Exit from Spreadsheet click here to exit
File Edit View Insert Format Tools Window Help
References
Times New Rom
8
them essential.
1)Management of Time and space
Collaborative projects can be categorized according to space and time [Johansen et al 1991]. The work can take place in the same room (proximal space) or in several different rooms, buildings, and countries (distal space). People can work together on the project at the same time (synchronous) or at different times (asynchronous). Figure 1 shows examples of different collaborative applications for each of these situations. Time and space issues directly impact software design choices. For example, strictly asynchronous applications like email do not require work on issues like simultaneity, while applications meant for synchronous, proximal work need to take into account the physical distribution of the potential users.
Space
Proximal
Distal
Time
Synchronous
Electronic meeting software
Videoconferencing
Asynchronous
Shared bulletin board
Email
Figure 1. Examples of collaborative applications according to time and space
communicating include chat tools, fax and videoconferencing tools.
Designers of collaborative software can choose to let the group communicate using external tools or incorporate communication tools in the collaborative application. The advantage of integrated communication tools is that they place the conversation in context (e.g. comments attached to specific paragraphs in word processors), thus increasing awareness. This decreases the possibility that the message becomes lost in the volume of communication that each group member can receive (e.g. email overload). Integrated communication has its disadvantages, the most important being that the user must open the application in order to access these messages. Because of this, an urgent message might not be seen in a timely manner. When comments are allowed, the softwaredesigner must decide whether they arewill be separate from the artifact (thus isolating them from their context) or will be integratinged them with or alongside the section they refer to. In the latter case, the comments need to be easily distinguishable from the artifact itself, especially when this is a written document. Other potential problems [Cadiz Gupta Grodin, 2000] with comments include orphaning, when the artifact to which a comment refers is removed, and irrelevance, when the sectionartifact is so modified that the comment no longer makes sense.

Saving

- Done in application within VNC window
  - Stores to temporary location (pseudo-user)
- Ending
  - Exit the application (checks for saved file)
  - Exit VNC, which commits changes to CVS repository AND removes the lock
- Working on 1-step exit....

Computing environment

- H/W is standard PC
  - under Linux (Mandrake, Xandros/Debian, Knoppix/Debian)
- “Glue” code (telltable-server) mostly written in Perl
  - links Apache, CVS, CVS-Web, DB:File, VNC server and client tools
  - Some Java to patch “bugs” in VNC and test browser

Some nasty issues

1. Simultaneous editing, or two five-year olds with one jelly-bean
2. Keeping hackers out of the server
3. Facilitating and controlling who has access to what
4. Making the server run and export the application
5. Providing VNC client to the user

Simultaneous editing

- Our choice – lock selected file for duration of a session
  - Must provide an automated clearup if sessions not properly closed
  - Involves social dynamics of collaborators
- No simultaneous collaboration in this model
- But document provenance is clear

Security

- TellTable users are NOT operating-system users on the server
- All file operations are performed by pseudo-users. Real users are “attached” to a p-user when they select a document to edit or application to run
- Files are copied to p-user workspace and copied back at application close

Facilitating access

- Use a simple web interface under Apache-SSL (https://...)
- Traditional Web page login
- User presented with files he/she can access, with “links” to permitted actions
- “In use” files are flagged and edit actions not available.

Client VNC viewer

- Could install a VNC client locally
- We chose Java VNC applet
- Screen within a screen
  - Some issues of screen real-estate
  - Font rendering glitches are sometimes painful
- No local install (if browser Java-enabled!)

What applications?

- Mostly OpenOffice.org suite
  - Published XML standard format files
  - Change recording available if file loaded with it turned “on”
  - User cannot alter this, so we have audit capability
- Neil Smith's TellTable Analyze for visualizing spreadsheet audit trails

What Apps? (cont.)

- Gnumeric spreadsheet
- Tested Microsoft Excel running under CodeWeavers Crossover Office

Auditing (Spreadsheets)

- Sheet, cell, timestamp, old content, new content
- Tool (TT Analyze) to filter large mass of data e.g., only formulas that have been replaced by numbers
- What does audit mean for slides?

Performance

- Workable for limited users on “ancient” PC (Pentium 300 level)
- Current server is dual-processor 2.5GHz
- Memory (MB)
  - 151 + 5.8 (available *suid*) + 17.0 (used *suid*)
- Execution speed ~ single machine speed divided by no. of users

Future

- Things to improve
  - Administrative functions
  - 2-step exit
  - Copy/paste improved
- Things to add
  - Enhanced file documentation
  - Other applications (AbiWord, file management tools, remote backup, ...)

Interested?

- You can download TellTable from
  - telltable-s.sf.net
  - Demo CD
    - from me
    - or download, burn and boot from macnash.admin.uottawa.ca/files/ttknop[date].iso where *date* will change with update
- More information available here
  - www.telltable.com