Subversion for UCSC Genome Browser

Mark Diekhans
<markd@soe.ucsc.edu>
July 2009

Subversion History and Goals

- Started in 2000
- Centralized Revision Control System
- Replacement for widely used CVS
  - same conceptual model as CVS
  - similar command structure (`svn subcommand ...`)
  - completely new implemented, not based on RCS
  - migration of CVS repositories preserving history
  - client/server model
- Open Source `http://subversion.tigris.org/`
- Non-goal of developing new paradigms for managing software

CVS Problems Addressed

- Atomic commits
- Versioning of directories and symbolic links
- Rename, move, and copy maintaining revision history
  - Entire sub-trees can be quickly re-factored
- Space-efficient support for binary files
- Efficient branching and tagging, independent of file size
- Branch merging
  - subversion 1.5 added merge tracking
  - still crude compared to distributed VCS
- many operation work on either repository or working directory

SVN Features

- Access methods:
  - Locally mounted file systems
  - ssh
  - HTTP via Apache WebDAV
    - provides authenticated remove access
- Environment for developing source code management tools:
  - Client/server API with bindings in several languages
  - XML output option for commands
- sub-module checkouts
- IDE integration:
  - Eclipse, EMACS, vim, KDevelop
- free online book available http://svnbook.red-bean.com/
- many other tools available
- can server as a master repository for *Mercurial* and *git*

Using Subversion

- Repository addressed by URL:
  - `file:///projects/compbiousr/svnroot/hausslerlab/ccds`
  - `svn+ssh://hgwdev.ce.ucsc/projects/.../hausslerlab/ccds`
  - `http://karchin-hn02.icm.jhu.edu/karchinsvn/R01-ls-var`
- branches and tags are all just logical *copies* (very cheap)

```
svn/code/pycbio/trunk/src/lib
svn/code/pycbio/tags/v1/src/lib
                      /v2/src/lib
                /branches/psched/src/lib
                          /pline/src/lib
```

Example Commands

```
svn help
svn ls file:///projects/compbiousr/svnroot/hausslerlab
svn co file://stuff/svn/code/pycbio/trunk pycbio
cd pycbio
svn status
svn diff
svn update
svn resolved src/lib/pycbio/fred.py
svn commit -m "now is the time for all good software"
```

Conclusions

- Subversion offers a smooth migration path for CVS
- Already in use by other BME projects
- Merge and parallel development support not as powerful as distributed VCS
  - I don't have any experience with D-VCS