SUBVERSION

Subversion is an open source version control system.

Social Implications Friday

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Recall: Groups and users

command	description
`chmod`	change permissions for a file
`umask`	set default permissions for new files
`groups`	list the groups to which a user belongs
`chgrp`	change the group associated with a file

- setting groups on files: chgrp group filename
  - **`chgrp -R cse303k *`** (set group to cse303k)
- permission codes: chmod who(+-)what filename
  - **`chmod -R g+rwX *`** (group can read/write)

Version control

- Software that tracks and manages changes to a set of source code files and resources.
- Helps teams to work together on code projects
  - a shared copy of all code files that all users can access
  - keeps current versions of all files, and backups of past versions
  - can see what files others have modified and view the changes
  - manages conflicts when multiple users modify the same file

Repositories

- **repository**: Central location storing a copy of all files.
- **check in**: adding a new file to the repository
- **check out**: downloading a file from the repo to edit it
  - you don't edit files directly in the repo; you edit a local working copy -- once finished, you check in a new version of the file
- **commit**: checking in a new version of a file(s) that were checked out
- **revert**: undoing any changes to a file(s) that were checked out
- **update**: downloading the latest versions of all files that have been recently committed by other users

Subversion (svn)

command	description
`svnadmin`	make administrative changes to an SVN repository
`svn`	interact with an SVN repository

- Subversion: a relatively modern version control system
  - supports folders, better renaming, atomic commits, good branching
  - currently the most popular free open-source version control system
- installing in Ubuntu:
  - **`$ sudo apt-get install subversion`**
- creating a repository:
  - **`$ svnadmin create path`**
- http://svnbook.red-bean.com/ (look for Quick Start Guide)

SVN commands

command	description
`svn add` *`files`*	schedule files to be added at next commit
`svn ci` *`[files]`*	commit / check in changed files
`svn co` *`files`*	check out
`svn help` *`[command]`*	get help info about a particular command
`svn import` *`directory`*	adds a directory into repo as a project
`svn merge` *`source path`*	merge changes
`svn revert` *`files`*	restore local copy to repo's version
`svn resolve` *`source path`*	resolve merging conflicts
`svn update` *`[files]`*	update local copy to latest version
others: **`blame, changelist, cleanup, diff, export, ls/mv/rm/mkdir, lock/unlock, log, propset`**	

Setting up a repo

- on attu, create the overall repository:
  ```
  $ svnadmin create repo
  ```
- from attu, add initial files into the repo (optional):
  ```
  $ svn import units-1.87 file:///homes/iws/notkin/dn-
    repo/test -m "Initial Import"
  ```
- give the repo read/write permissions to your cse303 group
  ```
  $ chgrp -R mygroup repo
  $ chmod -R g+rwX,o-rwx repo
  ```

Adding files to a repo

- on your computer, set up a local copy of the repo
  ```
  $ svn co svn+ssh://attu.cs.washington.edu/foldername
  ```
  - or, if you're setting up your local copy on attu:
  ```
  $ svn checkout file:///homes/iws/notkin/dn-repo/
  ```
  - after checkout, your local copy "remembers" where the repo is
- copy your own files into the repo's folder and add them:
  ```
  $ svn add filename
  ```
  - common error: people forget to add files (won't compile for others)
- added files are not really sent to server until commit
  ```
  $ svn ci filename -m "checkin message"
  ```
  - put source code and resources into repo (no .o files, executables)

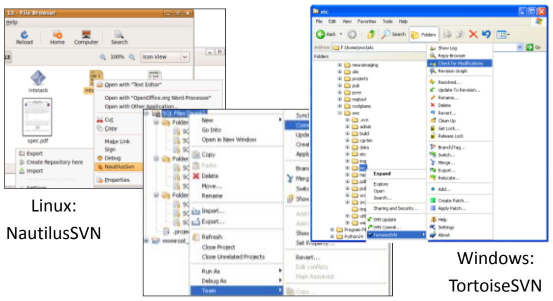
Committing changes

- updating (to retrieve any changes others have made):
  ```
  $ svn update
  ```
- examining your changes before commit:
  ```
  $ svn status
  $ svn diff filename
  $ svn revert filename
  ```
- committing your changes to the server:
  ```
  $ svn ci -m "added O(1) sorting feature"
  ```

Commands I executed on attu

```
• svnadmin create dn-repo
• svn import units-1.87 file:///homes/iws/notkin/dn-
  repo/test -m "Initial Import"
• svn checkout file:///homes/iws/notkin/dn-repo/
• svn update  file:///homes/iws/notkin/dn-repo/
• svn update
• svn commit -m "new"
• svn list
• svn checkout file:///homes/iws/notkin/dn-repo/
• svn list
• svn commit -m "try again"
• svn update
```

Shell/IDE integration



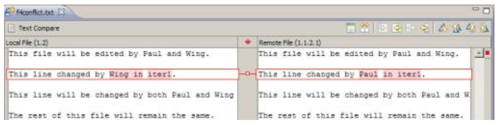
Linux:
NautilusSVN

Eclipse:
Subclipse

Windows:
TortoiseSVN

Merging and conflicts

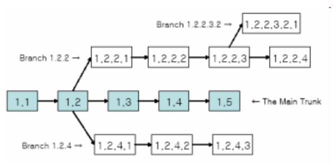
- Merge: Changes applied at same time to same files
  - happens when two users check out same file(s), both change it, and:
    - both commit, or
    - one changes it and commits; the other changes it and updates
- conflict: when the system is unable to reconcile merged changes
  - resolve: user intervention to repair a conflict. Possible ways:
    - combining the changes manually in some way
    - selecting one change in favor of the other
    - reverting both changes (less likely)



```
This file will be edited by Paul and Wing.            This file will be edited by Paul and Wing.

This line changed by Wing in iter1.                   This line changed by Paul in iter1.

This line will be changed by both Paul and Wing       This line will be changed by both Paul and W

The rest of this file will remain the same.           The rest of this file will remain the same.
```

Branches

- **branch** (fork): A second copy of the files in a repository
  - the two copies may be developed in different ways independently
  - given its own version number in the version control system
  - eventually be merged
  - **trunk** (mainline, baseline): the main code copy, not part of any fork



Social implications Friday

- What electronic activities can and should be monitored?
  - Does it matter if you're at home, at work, at school, at a public library, etc.?
  - Does it matter what you are doing?
  - Does it matter why you are being monitored?
- How do *you* decide what to put on Facebook or equivalent?

Questions?