

# Version control with Subversion

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*With searching comes loss  
And the presence of absence:  
“My Thesis” not found.*

# Version Control

- A tool for managing changes to a set of files
- Each set of changes creates a new revision of the files

# Why Version Control?

- Recover from mistakes
- Collaborate with others
- Track history and evolution of the project
- Work on multiple versions simultaneously

# Which Version Control?

- git
- Hg
- Subversion
- Bazaar

Any of them is better than none!

# Subversion

- We will use Subversion (svn)
- Mature, simple, widely-available
  - Cross-platform—Linux, Mac, Windows
  - GUI front ends
    - [SmartSVN](#): cross-platform
    - [StatET](#): R GUI with built-in support for Subversion
  - Used by R, RForge, and Bioconductor
- Principles translate directly to other VCSs!

## Basic principles

- Master copy of the file is kept in a central *repository*
- Each author edits a *working copy*
- When ready to share the changes, *commit* them to the repository
- Other people can then *update* to get those changes

# Quick start to using Subversion

# Subversion Illustrated

- You have an existing project. . .

# Initialize Svn

- First, create a repository on a server

```
svnadmin create repository_directory_name
```

## Import the project

- First, create a repository on a server
- And then import your project into it

```
svn import svn+ssh : //full_path_to_repository/project
```

## Checkout working copy

- First, create a repository on a server
- And then import your project into it
- Finally, check out the project into a working directory

```
svn checkout svn+ssh : //full_path_to_repository/project
```

# Basic workflow

## Svn Illustrated: Continue working

- Make changes in the working copy...

## Svn Illustrated: Current status

- Make changes in the working copy...
- Check what you've done

```
svn status  
svn diff
```

## Svn Illustrated: Commit

- Make changes in the working copy...
- Check what you've done
- Commit changes into the repository

```
svn commit
```

## Svn Illustrated: Adding and deleting files

- So far we have only shown how to edit existing files
- You can add more files to version control
- Or delete the ones you don't need any more

```
svn add  
svn delete  
svn move
```

## View History

- Subversion keeps track of everything you've done
- Remember the commit message?

```
svn log
```

# Undo Changes

- It's easy to undo a bad change before you commit:

```
svn revert
```

- You can also get back any previous commit

```
svn copy repository_path_to_file@version local_file
```

# Using Subversion to sync multiple workplaces

## Sync to home

- On your home machine:
  - checkout the repository...
  - get a working copy at home

```
svn checkout
```

# Work from home

- On your home machine:
  - make changes...
  - commit

## Catch up at the office

- At the office:
  - sync to repository. . .
  - catch up with changes from home

```
svn update
```

# Conflicting changes

- What if you make changes in two working copies at once?
- On your home machine:
  - make changes...
  - commit
- At the office:
  - make changes...
  - commit... oops!
  - have to resolve conflicts with changes from home

# Resolve conflicts

- At the office:
  1. sync to repository
  2. resolve conflicts
  3. commit

```
svn update  
svn resolved  
svn commit
```

## Working with Others

- It's just like syncing between work and home!

And that's it!

## Essential Commands

- help: show a brief explanation of any command
- import: import current directory into the repository
- checkout: create a working copy
- status: list state of files in the working copy (changed, new, etc.)
- diff: see differences between the working copy and the repository
- add: start tracking a file in Subversion
- commit: add changes from the working copy to the repository
- update: receive changes from the repository into the working copy
- log: see history of all changes
- svnadmin create: initialize a repository (once)

# SVN book

- There is a free online book on using Subversion
  - <http://svnbook.red-bean.com>
- Most important chapter:
  - <http://svnbook.red-bean.com/en/1.6/svn.tour.cycle.html>