Revision Control Systems

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Revision Control Systems

C.S. Rhodes

Introduction
Motivation
What is it?

Darcs

Revision Control

cis320project

notes.txt
index.php
dbschema.sql
project.css
jquery.js
project.js
index.php
project.js
index.php
newdbschema.sql
...

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Revision Control

Why use revision control?

- tracking changes made to a collection of files;
  - what was changed? by whom? when?
  - ‘free’ backup.
- managing changes made to a collection of files;
  - revisit earlier versions;
  - ‘global undo’ and ‘redo’;
  - merging multiple changes into one consistent state.
- dealing with collaborative work;
  - not immediately relevant to your project;
  - (likely) very relevant to your future work;
  - highly relevant to Open Source software development.
Revision control is not just for source code:
  - text documents (e.g. \LaTeX\ documents);
  - machine configuration files;
  - experimental data;
  - database schemata;
  - ... (anything that changes).

Embedded Revision Control Systems:
  - Microsoft Word, OpenOffice Writer (‘Track Changes’);
  - Content Management Systems;
  - Wikis (e.g. Wikipedia);
  - ...
• Centralized systems: ‘master’ repository with ‘working copies’
  • ancient/dead: RCS, SCCS;
  • creaky: CVS;
  • active(ish): Subversion, Perforce.
• Distributed systems: peer-to-peer, working copies come with history
  • creaky: svk, arch, tla, baz, Bitkeeper;
  • active: git, darcs, mercurial, bzr, monotone.
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Revision control systems comprise:

1. **Tools for manipulating changes;**
   - Theory of *patches.*

2. **A database system to keep track of changes;**
   - a file containing a list of patches;
   - the zipped content of patches;
   - both kept within a _darcs_ directory.

3. **Mechanisms for distributing changes.**
   - pull patches from local filesystem, http or ssh;
   - push patches to local filesystem, or over ssh;
   - send patches by e-mail.
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1. Tools for manipulating changes;
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Every working copy
- is a first-class repository;
- contains the entire development history;
- can be used for independent development.

New branches are created by copying existing repositories.

The patch is the fundamental object:

The state of a repository is defined to be the result of applying a given sequence of patches to an empty tree.
Where to look for more information:

- Darcs website: http://darcs.net/
- Wiki: http://wiki.darcs.net/
- Links from http://doc.gold.ac.uk/~mas01cr/teaching/cis320/