

CSE 331 SOFTWARE DESIGN & IMPLEMENTATION VERSION CONTROL RESEARCH @ UW

Autumn 2011

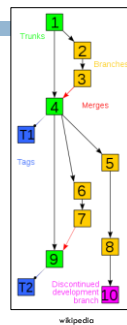
Version control: research @ UW

- Two trailers...for a research talk and a research demo at the 2011 Joint European Software Engineering Conference and ACM SIGSOFT Symposium on the Foundations of Software Engineering (ESEC/FSE)
- <http://www.youtube.com/watch?v=qtWqU4ac-IM>
- <http://www.youtube.com/watch?v=largb4vdEMo>

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Version control

- Tools intended to help teams of people work concurrently and on shared code – both are needed for a collaborative project to make genuine progress
- Track multiple versions and variants
- Help identify and manage conflicts
- Reduces chances of data loss



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Centralized version control

- The standard client-server approach of the first decades of version control – SCCS, RCS, CVS, SVN, ...
- A server holds the “real” repository – it represents the core reality of the project
- Team members check-out and work on copies of the repository
- When they check-in those changes, they are checked against the repository and it is updated
 - Handling merges must be done if there are conflicts

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Decentralized version control

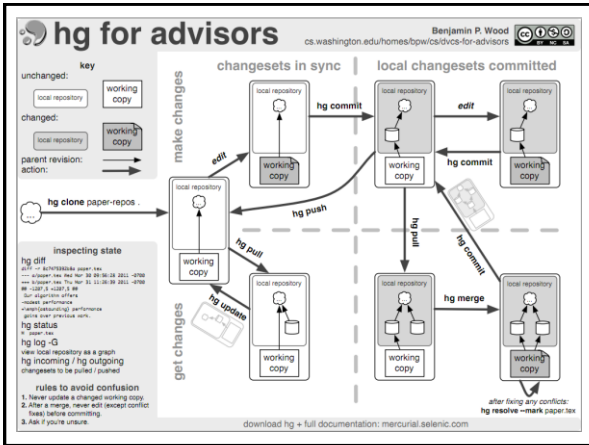
- Developed in the past decade, taking a more independent peer-to-peer approach for versioning
- Every copy is a full-fledged repository – if there is a “main” repository it is only by agreement
 - There is an explicit separation between a repository and a working copy of that repository
- Repositories are synchronized by exchanging change-sets
 - Allows fast operations (committing or reverting changes, for example), because they are done locally
 - Only need to interact with peers when synchronizing changes
- Examples: git, mercurial (hg), bazaar, monotone, ...

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More differences

- Code from disparate repositories can be merged in more flexible ways – often (especially in open source projects) based on a web-of-trust relationship – change-sets can be applied for a person without “committer” status
 - Participation in projects does not require permission
- Local and remote repositories are synced using different commands
- Private, revision-controlled work is allowed – this is hard in centralized version control
 - Users can use their revision control system even for exploratory work
- No single machine remains as a point of failure

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A UW research project: Crystal

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Next steps

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- Worksheet A: due in class on Monday
 - 5% extra credit if you have it in on time and grade with the class during Monday lecture
- Worksheet B: available Monday PM
- Wednesday: Brief final review; course evaluations
- Friday: repeat of Monday, including extra credit, for Worksheet B
- Final: 14:30-16:20 Wednesday December 14
 - Intended to be one hour, but you can take the whole time

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