Software Engineering in Practice
Software configuration management

Diomidis Spinellis
Department of Management Science and Technology
Athens University of Economics and Business

dds@aueb.gr
http://www.dmst.aueb.gr/dds
@CoolSWEng

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Assignment (Software configuration management):

- Perform the following tasks on a popular open source project:
- Which project elements are under software configuration management control and which are not?
- Show diagrammatically two non-trivial workflows associated with elements that are under configuration management
- Measure and show development process data, obtaining them from a software configuration management system. You may find the Perceval tool useful for this task.
- Identify and categorize the software configuration management tools used.

Overview

- Management of the Software Configuration Management (SCM) process (!)
- Software configuration identification
- Software configuration control
- Software configuration status accounting
- Software configuration auditing
- Software release management and delivery
- Software configuration management tools

Organizational context for SCM

- Software development
- Hardware
- System's administration
- Customer
- Supplier
- Quality assurance
- Maintenance

Software configuration management plan

- Procedures, i.e.,
- Audit
- Version release
- Module updating
- Responsibilities
- Tools
- Procedures
- Create branch
- Merge branch

Tool selection and implementation

- Tool's capabilities
- Operating environment
- Legacy tools
- Financing
- Use scope
- Tool ownership
- Future directions
- Technical capabilities
- Integration requirements and capabilities
- Migration

Measures and measurements

- Development process
- Modules
- Changes
- Progress
- Personnel
- Teams
- Issues
- How do we respond?
- Source of the problem
- Training
- Do not cure the numbers

Software Configuration Identification

- Identify items to be controlled (see next)
- Identification methods
- Numeric (e.g. 4542)
- Functional / semantic (see next)

- Names
- Branches
- Branch types
- Responsibilities
- Releases
- Identification
- Material from suppliers
- Import
- Update

Semantic code versioning

Name the version using numbers as MAJOR.MINOR.PATCH and increase:

- MAJOR when making incompatible API changes
- MINOR when adding backwards compatible functionality
- PATCH when making backwards compatible bug fixes

What to put under configuration management

- Code
- Build recipes / scripts
- Specifications and designs
- Documentation
- Technical
- User
- Operational
- Installation
- Test material
- Tools
- Libraries
- System configuration, control, operation

Software library

- Definition
- Examples
- Internal
- Third party
- Ownership and support
- Dependencies
- Linking with configuration management
- Compiled
- Connection to the provider
- Installation package

- Source code
- Local changes

Commit etiquette

- Separate commit for each issue.
- Separate subject from body with a blank line.
- Do not end the subject line with a period.
- Capitalize the subject line and each paragraph.
- Use the imperative mood in the subject line.
- Wrap lines at 72 characters.
- Use the body to explain what and why you have done something.
- Link to issue.
- Add further headers as needed.

Notable Git Affordances

- Search for code with *git grep*
- Maintain code quality with *git commit hooks*
- Find fault with *git bisect*
- Explore a line's history with *git blame SHA^1*
- Find changes in history with *git log -S* or *git log -G*
- Perform large-scale changes with *git subst*

Configuration control

- Issue management systems
- Issues' life-cycle
- New
- More information needed
- Rejected
- Duplicate
- Open
- Needs testing
- Checked
- Fixed (released)
- Change log
- Configuration management linking
- Process exceptions

Configuration recording and reporting

- System changes
- Changes per file
- Changes per line of code

- Branch history

Release and delivery management

- Configuration management tools (see next)
- Parallel builds
- Build in different environments
- New release report
- Improvements
- Fixes
- Known issues
- Incompatibilities
- Transition

History of SCM tools

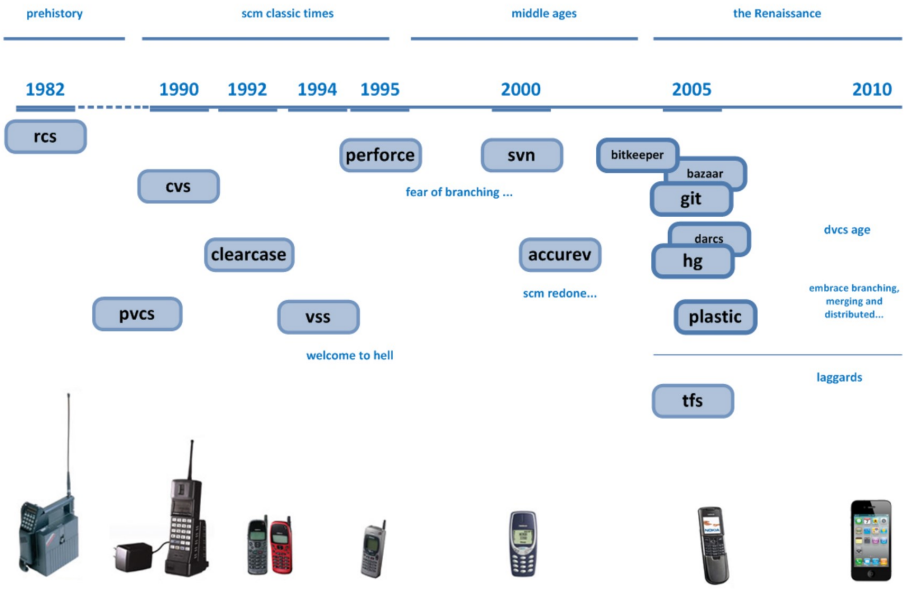

Figure 1: History of SCM tools

Source: PlasticSCM

Software configuration management tools

- Configuration control tools
- Centralized control

- Distributed
- Build tools
- Issue management systems

Recommended reading

- Conventional Commits
- Why Google Stores Billions of Lines of Code in a Single Repository

Preparation for the next lecture (1)

- Study Chapter 7 from SWEBOK v 3.0
- Assignment (Software engineering management):
- Perform the following tasks on a popular open source project:
- Evaluate the project management planning (process, schedule, risks, etc).
- Evaluate the project execution management.
- Evaluate the project's goal achievement measurements.

You can retrieve relevant information from the source code and the documentation of the project. In the case that the project misses some of the aforementioned information, how do you think that it should have recorded it?

Preparation for the next lecture (2)

- Video (Software engineering management: SCRUM) https://www.youtube.com/watch?v=D8vT7G0WATM