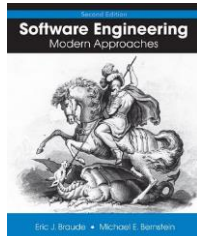


Software Engineering

Modern Approaches



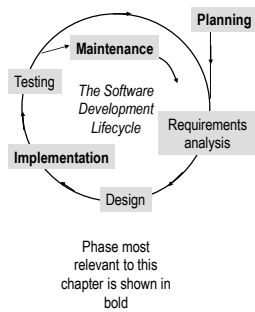
Eric Braude and Michael Bernstein

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Chapter 6: Configuration Management



Learning goals of this chapter

- What is the purpose of software configuration management?
- What activities does it consist of?
- How do you plan for configuration management?
- What tools are available to support it?
- How is configuration management handled in large projects, in practice?

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Software Configuration Management (SCM)

- Process of identifying, tracking and storing all the artifacts on a project
- Each artifact referred to a Configuration Item (CI)

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Configuration Management Goals

- **Baseline Safety**
Ensure that new or changed CI's are safely stored in a repository and can be retrieved when necessary
- **Overwrite Safety**
Ensure that engineer's changes to the same CI are applied correctly
- **Reversion**
Ensure ability to revert to earlier version
- **Disaster Recovery**
Retain backup copy in case of disaster

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SCM Activities

- Configuration identification
- Baselines
- Change control
- Version control
- Configuration audits
- Configuration status reporting
- Release management and delivery

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Configuration Identification

- First step in SCM
- Candidate CI's include:
 - source and object code
 - project specifications
 - user documentation
 - test plans and data
 - supporting software such as compilers, and editors
 - any artifact that will undergo modification or need to be retrieved at some time after its creation

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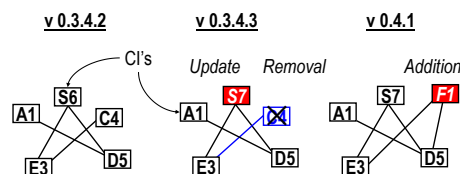
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Baseline Uses

1. Reproducibility
2. Traceability
3. Reporting

Baseline

- is an individual or group of CI's labeled at a key project milestone
- each version below is a baseline



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Change Control

- Set of activities to request, evaluate, approve or disapprove, and implement changes to baselined CI's
- Steps:
 - identification and documentation
 - analysis and evaluation
 - approval or disapproval
 - verification, implementation and release

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Identification and Documentation

- Name of requester
- Description and extent of the change
- Reason for the change (e.g. defects fixed)
- Urgency
- Amount of time required to complete change
- Impact on other CI's or impact on the system

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Analysis and Evaluation

- Reason for the change (e.g. bug fix, performance improvement, cosmetic)
- Number of lines of code changed
- Complexity
- Other source files affected
- Amount of independent testing required to validate the change

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Version Control

- Repository
- Checkin/Checkout
- Branching and merging
- Builds
- Version labeling

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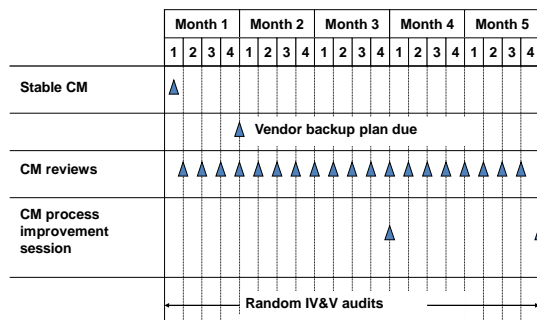
SCM Systems

- Git and GitHub
- Subversion
- CVS
- Rational Clearcase
- Microsoft's *SourceSafe*™
- Perforce
- www.cmtoday.com/yp/commercial.html

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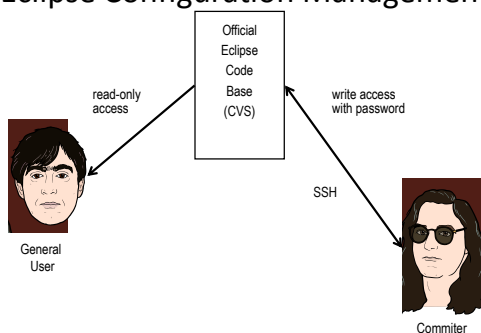
Configuration Management Schedule



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Eclipse Configuration Management



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Eclipse Plug-in Version Numbering

First development stream
- 1.0.0

Second development stream
- 1.0.100 (indicates a bug fix)
- 1.1.0 (a new API has been introduced)
The plug-in ships as 1.1.0

Third development stream
- 1.1.100 (indicates a bug fix)
- 2.0.0 (indicates a breaking change)
The plug-in ships as 2.0.0

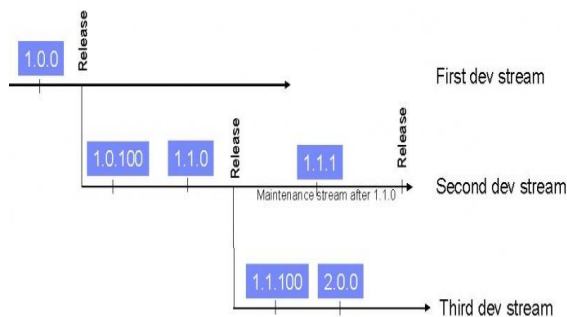
Maintenance stream after 1.1.0
- 1.1.1
The plug-in ships as 1.1.1

http://wiki.eclipse.org/Version_Numbering

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Eclipse Plug-in Version Numbering



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http://wiki.eclipse.org/Version_Numbering

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Planning Configuration Management

1. Roughly sketch out your SCMP
 - Determine procedures for making changes
 - Omit tool references unless already identified one
 - See the case study for an example
2. Specify what you need from a CM tool
 - For class use, maybe only *locking* and *backup*
3. Evaluate affordable tools against needs and budget
 - Commercial tools are in wide use
 - For class use, try free document storage web sites; simple method of checking out, e.g. renaming, can be too simple
5. Finalize your SCMP

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