3C05: Configuration Management

Unit 10: Configuration Management

Objectives

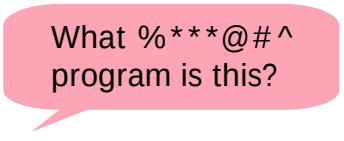
- To introduce the concept of configuration management and the key problems which can arise from configuration management failures.
- To present some techniques for configuration management.
- To briefly consider tools for automated configuration management support.

The Mythical Man Month

- If it takes one man two days to dig a hole, how long does it take four men to dig the same hole?
- Document Management
  - Test results
  - QA standards
  - Project schedules
  - User documentation
  - Object code

The Buzz

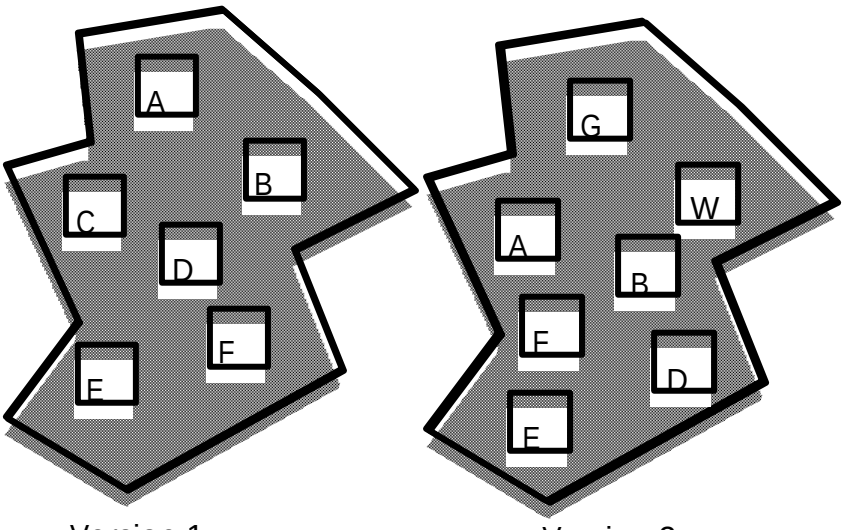
- This worked yesterday what happened?
- I can't recreate the bug in this copy?
- What happened to the fix I put in last week?
- The listing does not match the load image!
- Was that bug fixed in this copy, too?



Three Key Problems

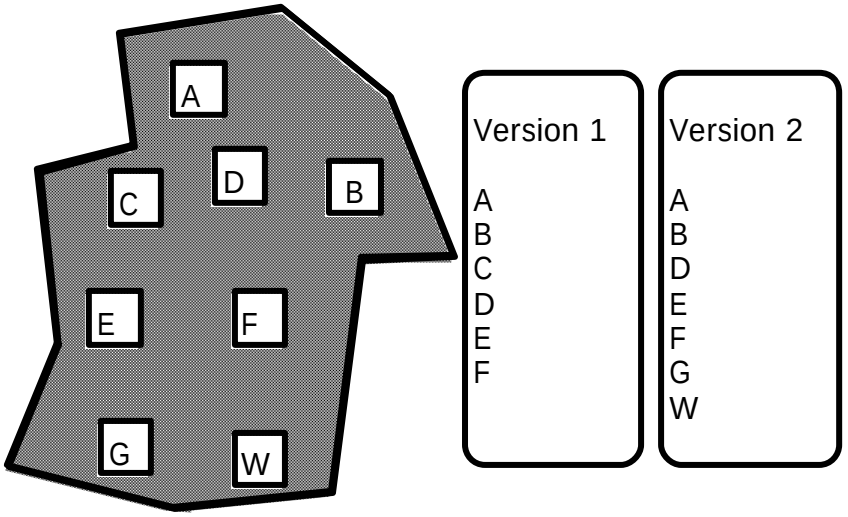
- The double maintenance problem
- The shared data problem
- The simultaneous update problem

Managing Versions

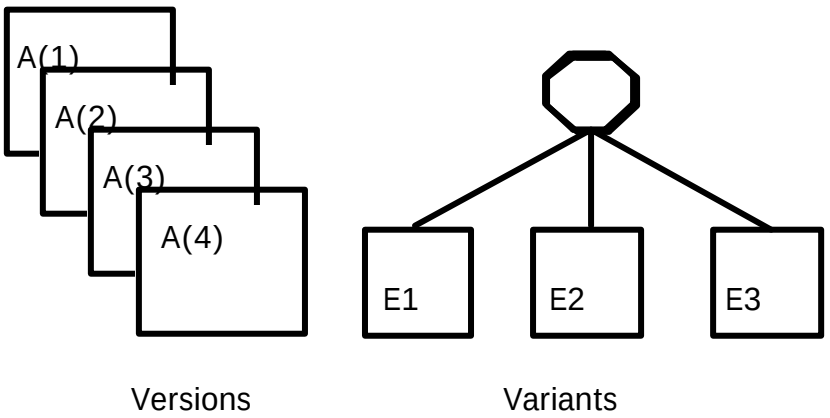


Version 1 Version 2

Managing Configurations



Versions & Variants



Storing Versions

- distinct files
- deltas
  - forward deltas
  - reverse deltas

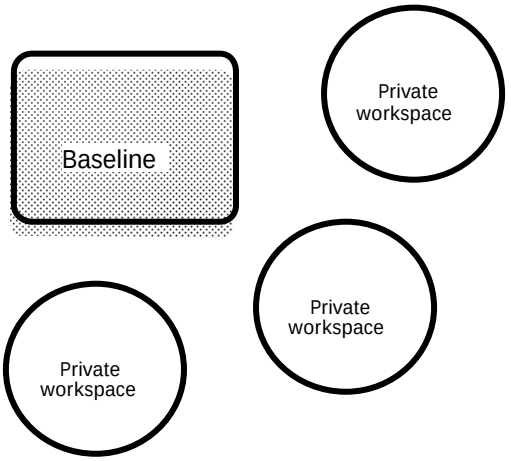
Derivations

- why?
  - debugging
  - reproduction
- recording derivations
  - precision
  - naming conventions
  - freezing
  - emphasising changes (change bars)

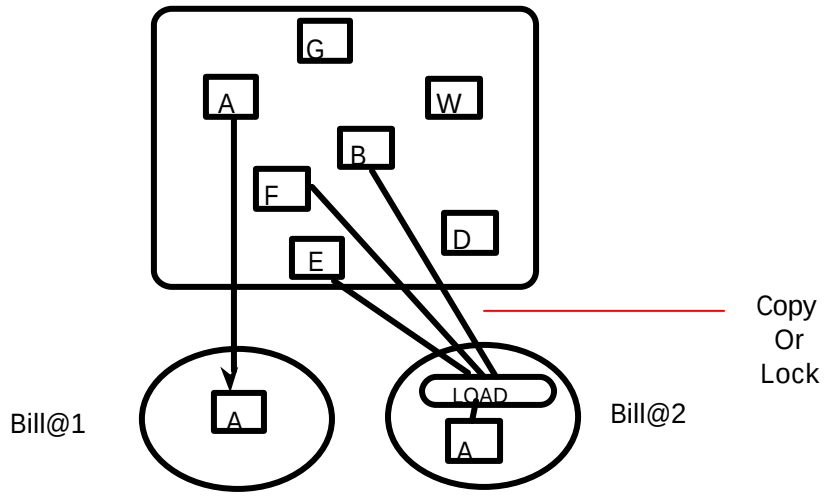
Interfaces

- “Information Hiding”
- Using architecture to control configuration management problems

Stability



Check Out



Baseline Integrity

- manual enforcement
- automatic enforcement
- compliance
- managing exceptions

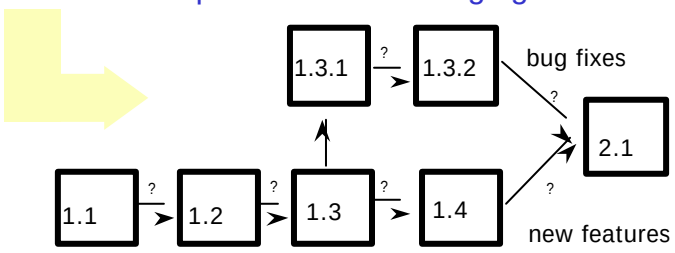
“Raw Unix”

- standard features:
  - directories
  - access control
- tools
  - SCCS (AT&T)
  - RCS (Tichy)

Tools

- SCCS
  - forward deltas
  - charge out and charge in
  - permission structures
- RCS
  - all the above plus automatic merging

CVS: the Concurrent Versions System is the dominant open-source network-transparent version control system.



More Tools

- Commercial, examples:
  - PVCS Version Manager
  - Rational ClearCase

Key Points

- Configuration management is the most important component of information management in software development.
- Automated tools such as CVS/RCS/SCCS can be used to provide configuration management and eliminate the double maintenance problem, the shared data problem and the simultaneous update problem.
- The key elements of this support are controlling the software baseline and recording derivations.