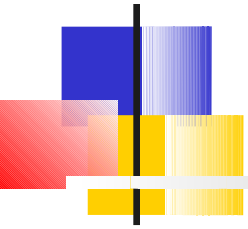
Information Systems Concepts

# Version Control



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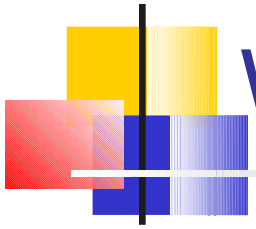
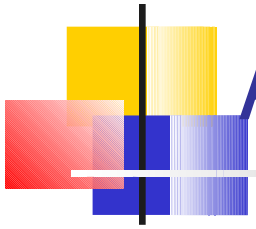
# Version Control

- A Version Control System (VCS) lets you track your files over **time**
- Also known as
  - Revision Control
  - Source Control
  - (Source) Code Management



# Why do you care?

- Have you ever saved a file, and then wanted to revert the changes you made? Have you ever wished you could see what a file looked like some time ago?
- Do you work in a team? Has it ever happened that you were working on a file, and someone else was working on the same file at the same time? Did you lose your changes to that file because of that?
- Have you ever found a bug in your project and wanted to know when (and how) that bug got into your files?



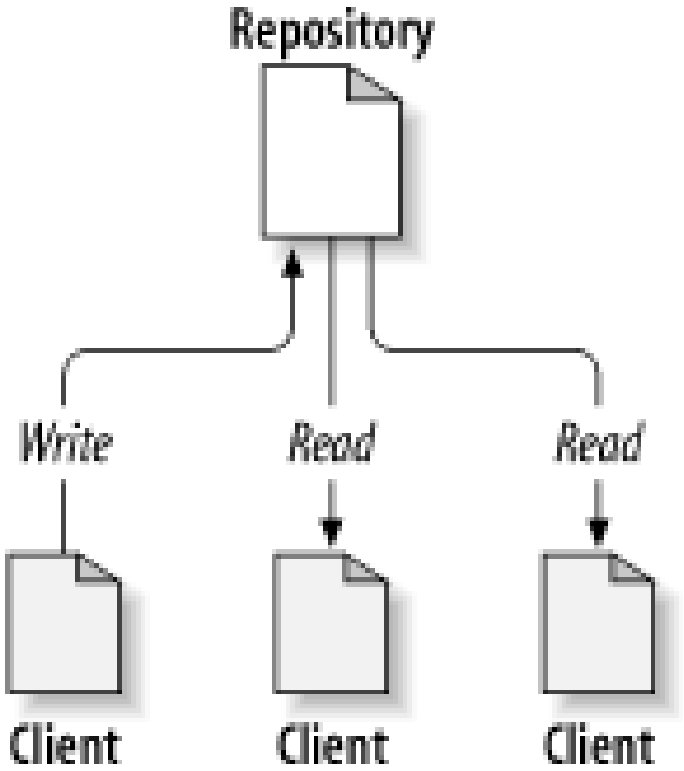
# A Poor Man's Version Control System

- A Poor Man’s VCS
  - Make a single **backup copy** (Document.bak).
  - If we’re clever, we add a **version number or date**: Document_V1.txt, DocumentMarch2007.txt
  - We may even use a **shared folder** so other people can see and edit files without sending them over email. Hopefully they re-label the file after they save it.
- Does this work for a large-scale development project?

# Version Control

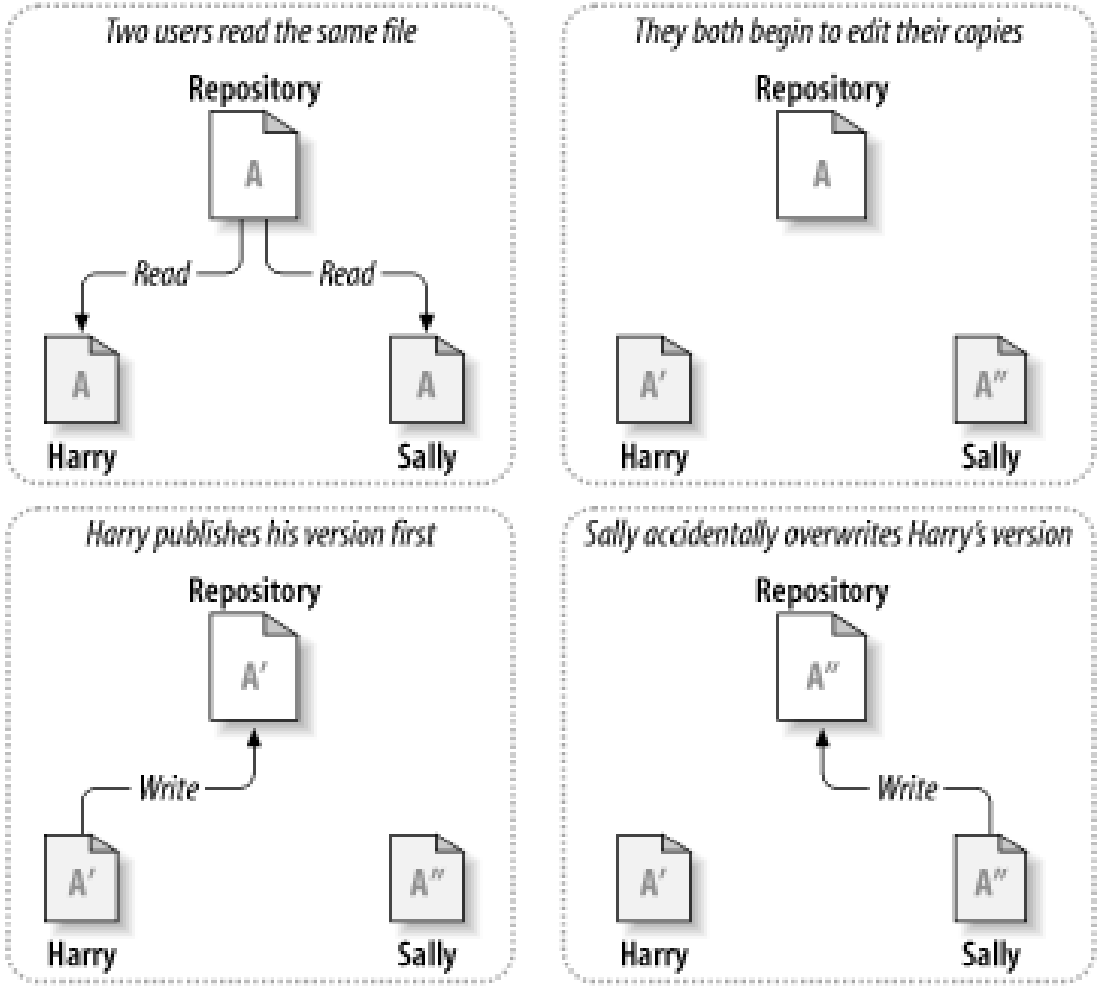
- Central (Client/Server) Model
  - Concurrent  Versions System (CVS)
  - Apache Subversion (SVN)
  - …
- Distributed Model
  - Mercurial
  - Git
  - …

# Client/Server Version Control System

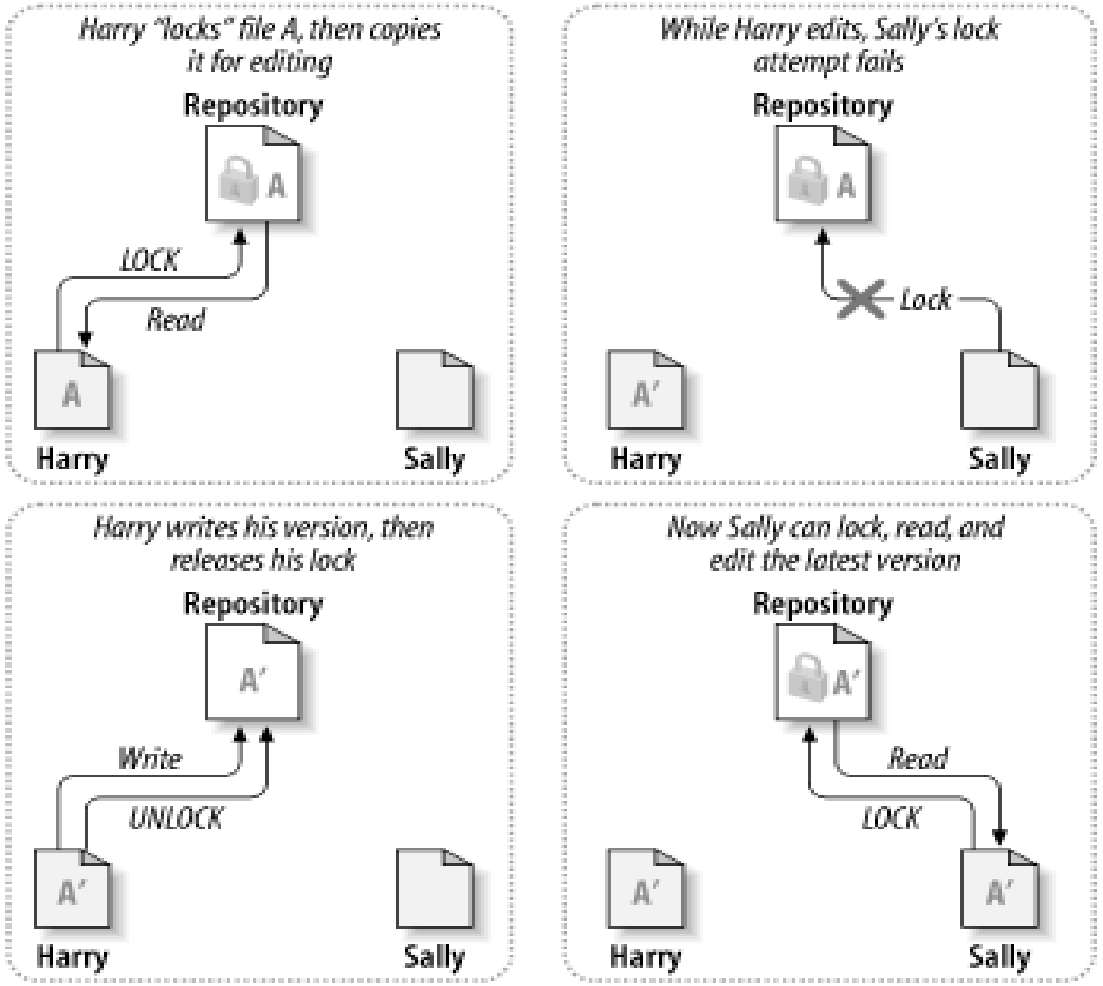



*--- Version Control with Subversion.*

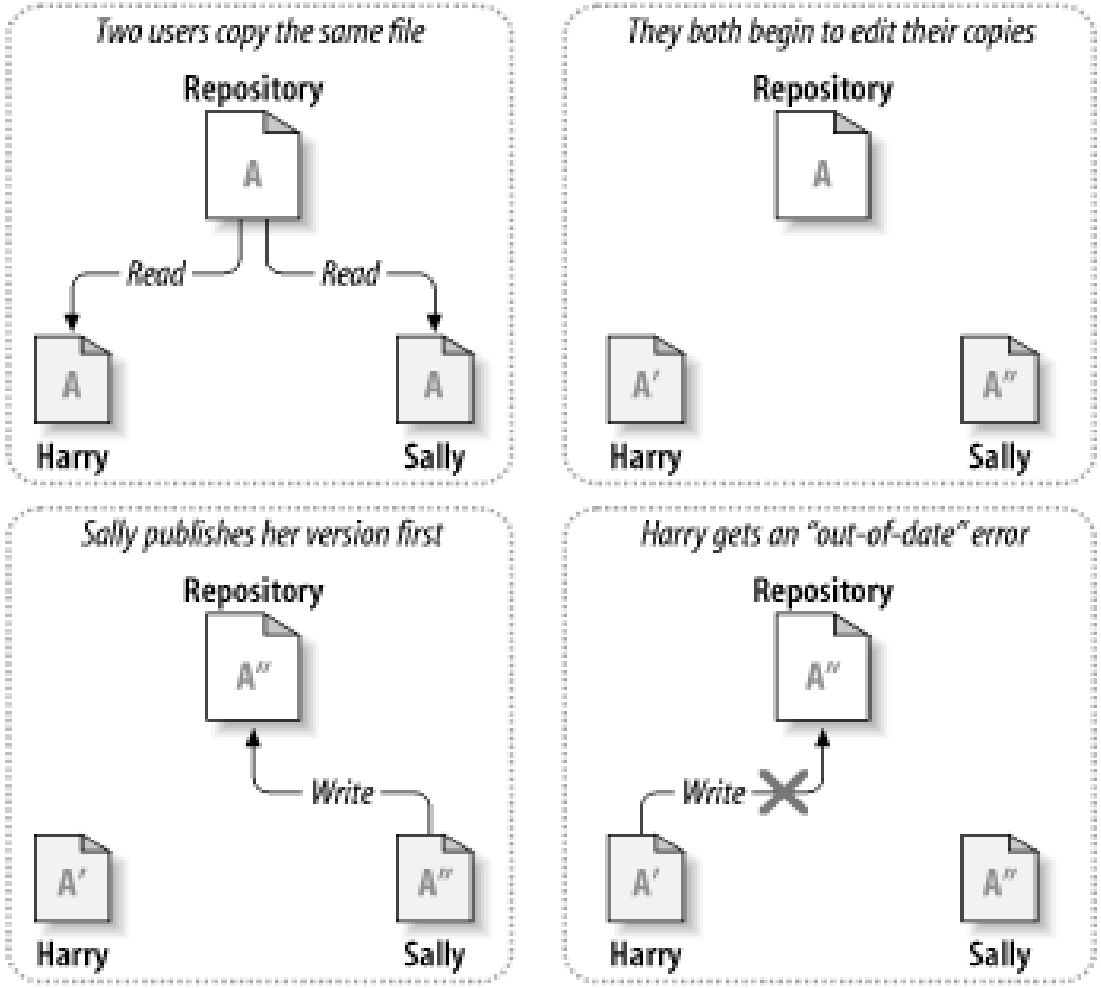
# VCS: The Problem to Avoid



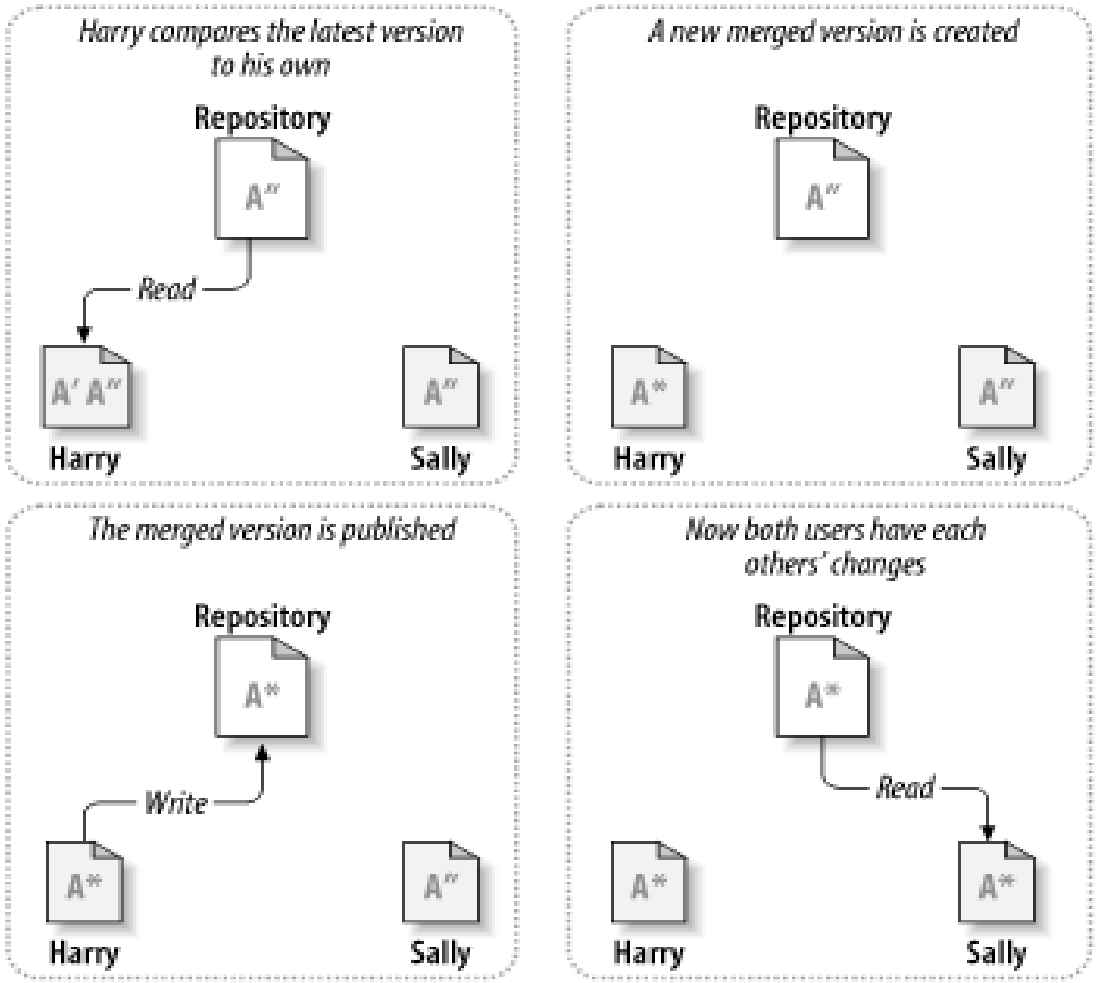
# VCS: Lock-Modify-Unlock Solution



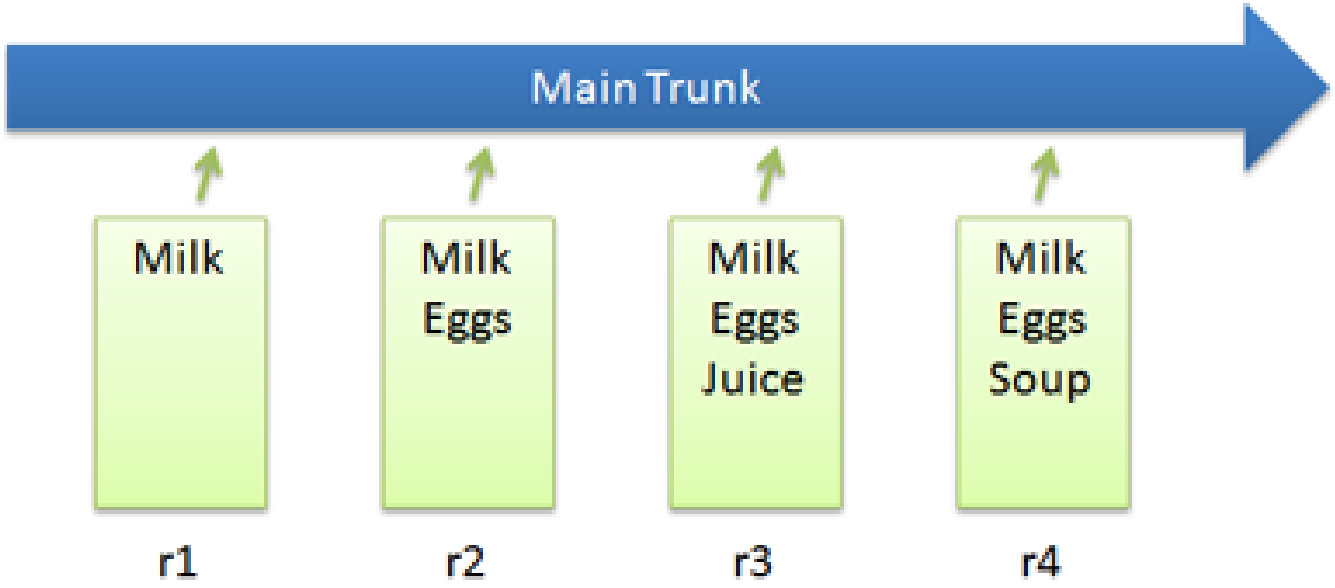
# VCS: Copy-Modify-Merge Solution (1)



# VCS: Copy-Modify-Merge Solution (2)

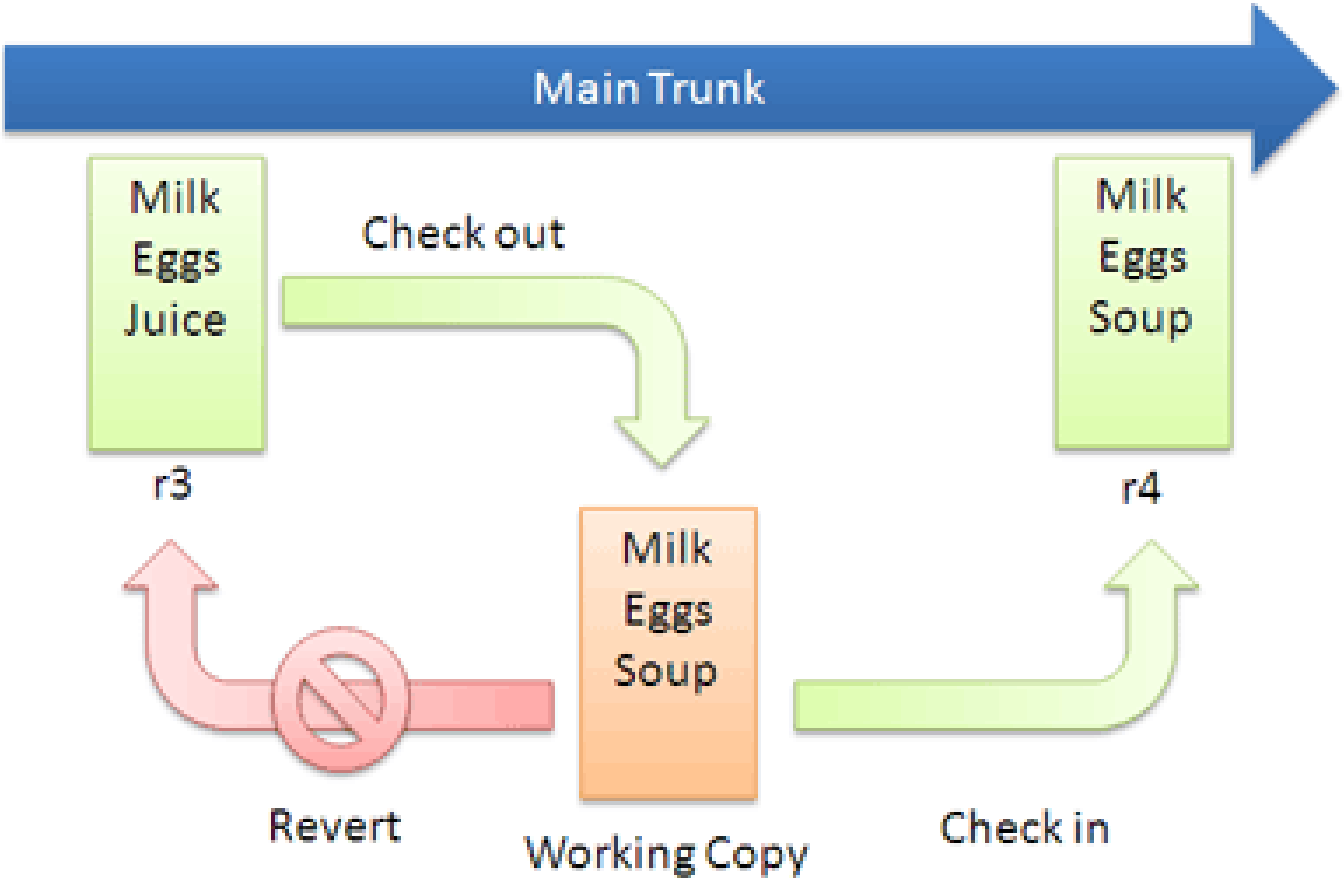


# Basic Checkins



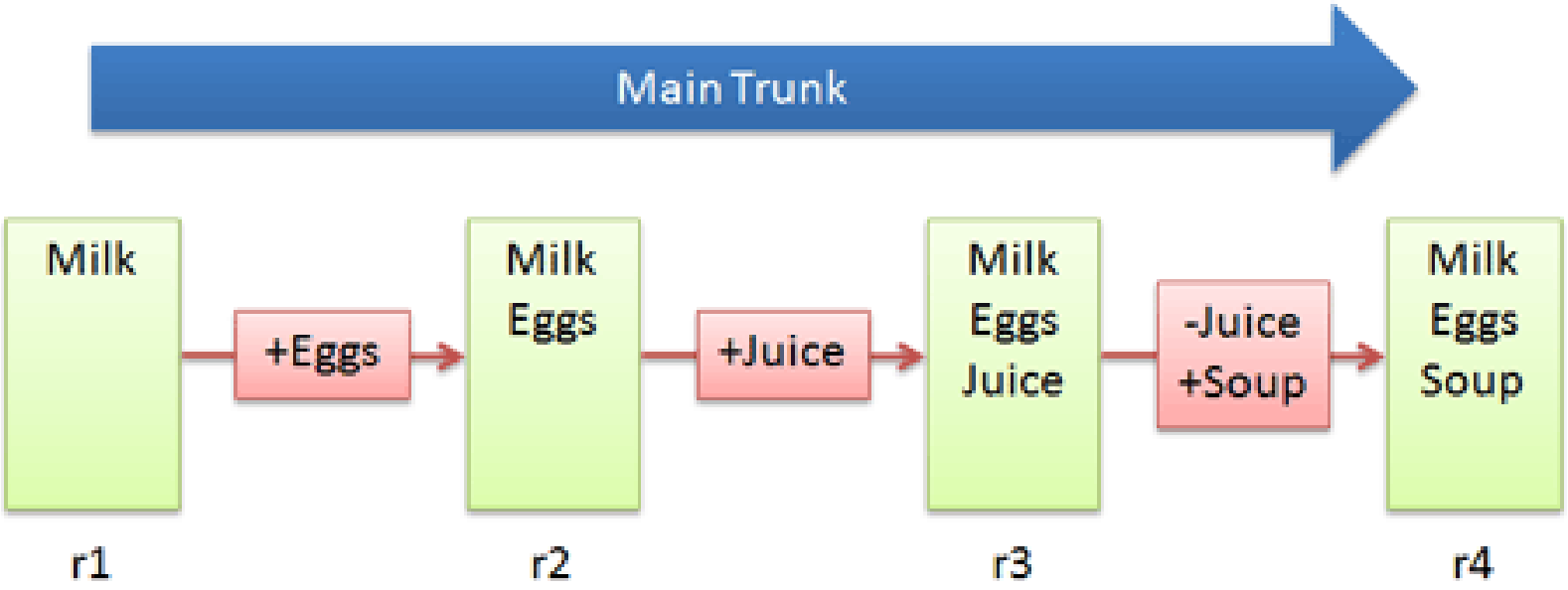

*--- A Visual Guide to Version Control.*

# Checkout and Edit




*--- A Visual Guide to Version Control.*

# Basic Diffs

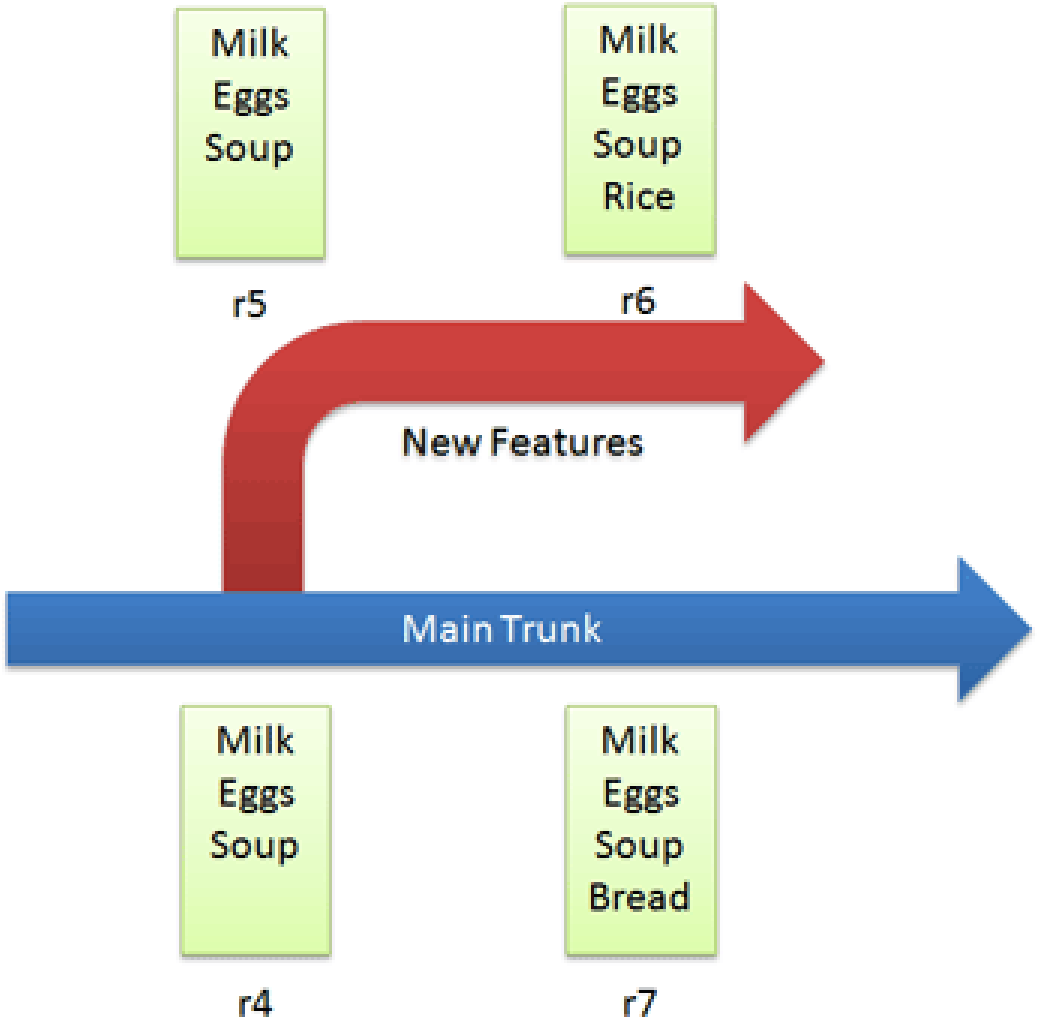



Most VCS store diffs rather than full copies of the file.

*What's the diff from r1 to r4?*

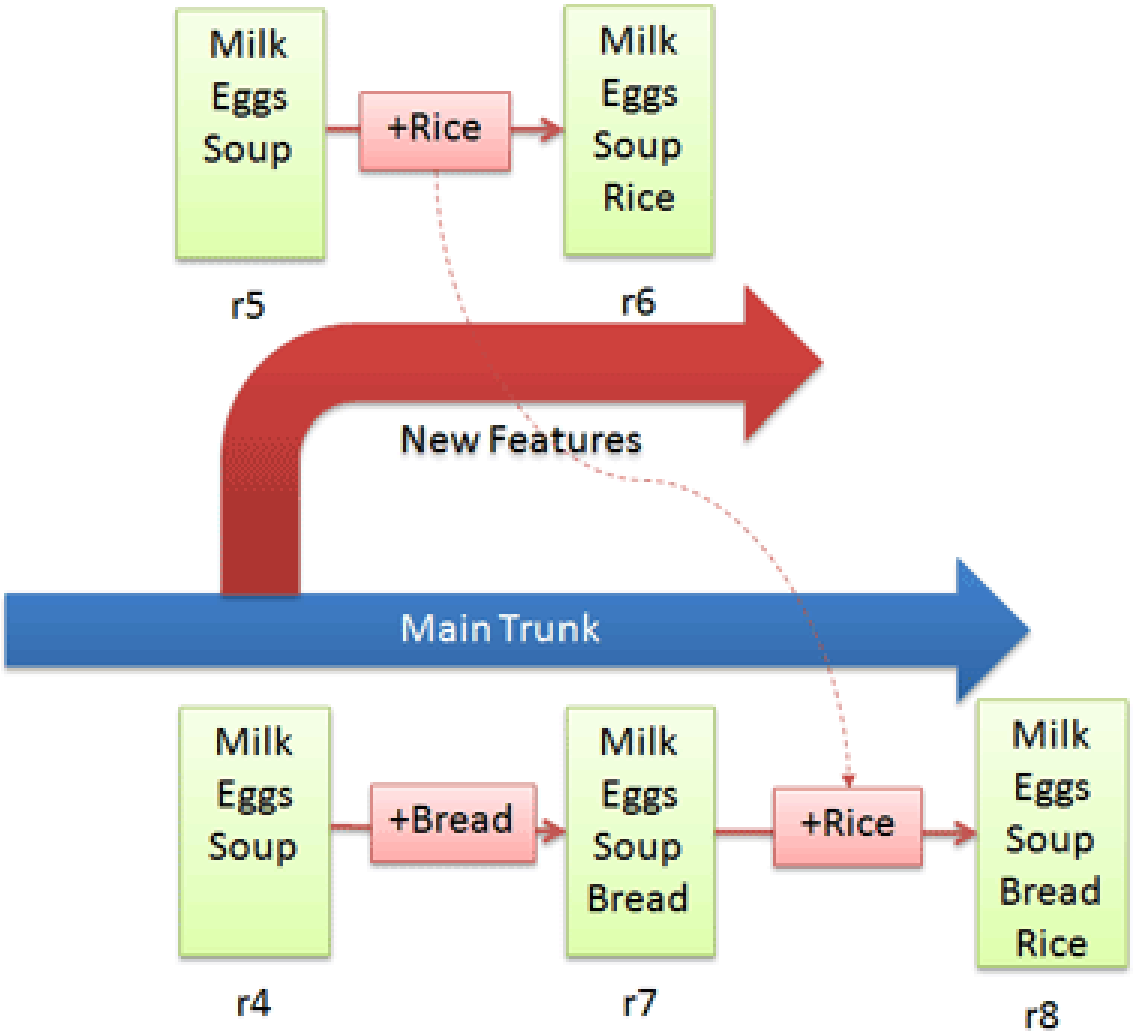
*--- A Visual Guide to Version Control.*

# Branching



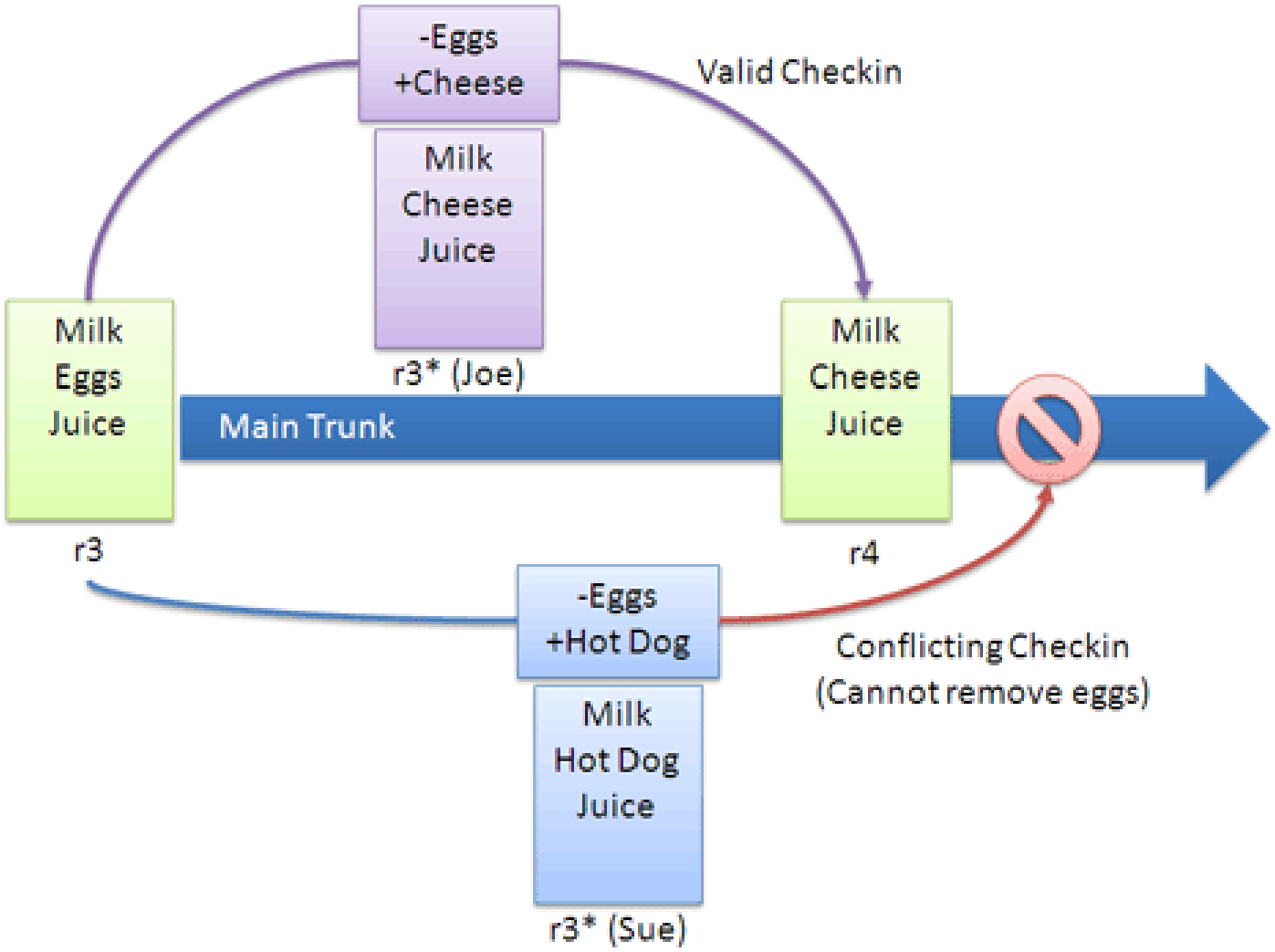

*--- A Visual Guide to Version Control.*

# Merging

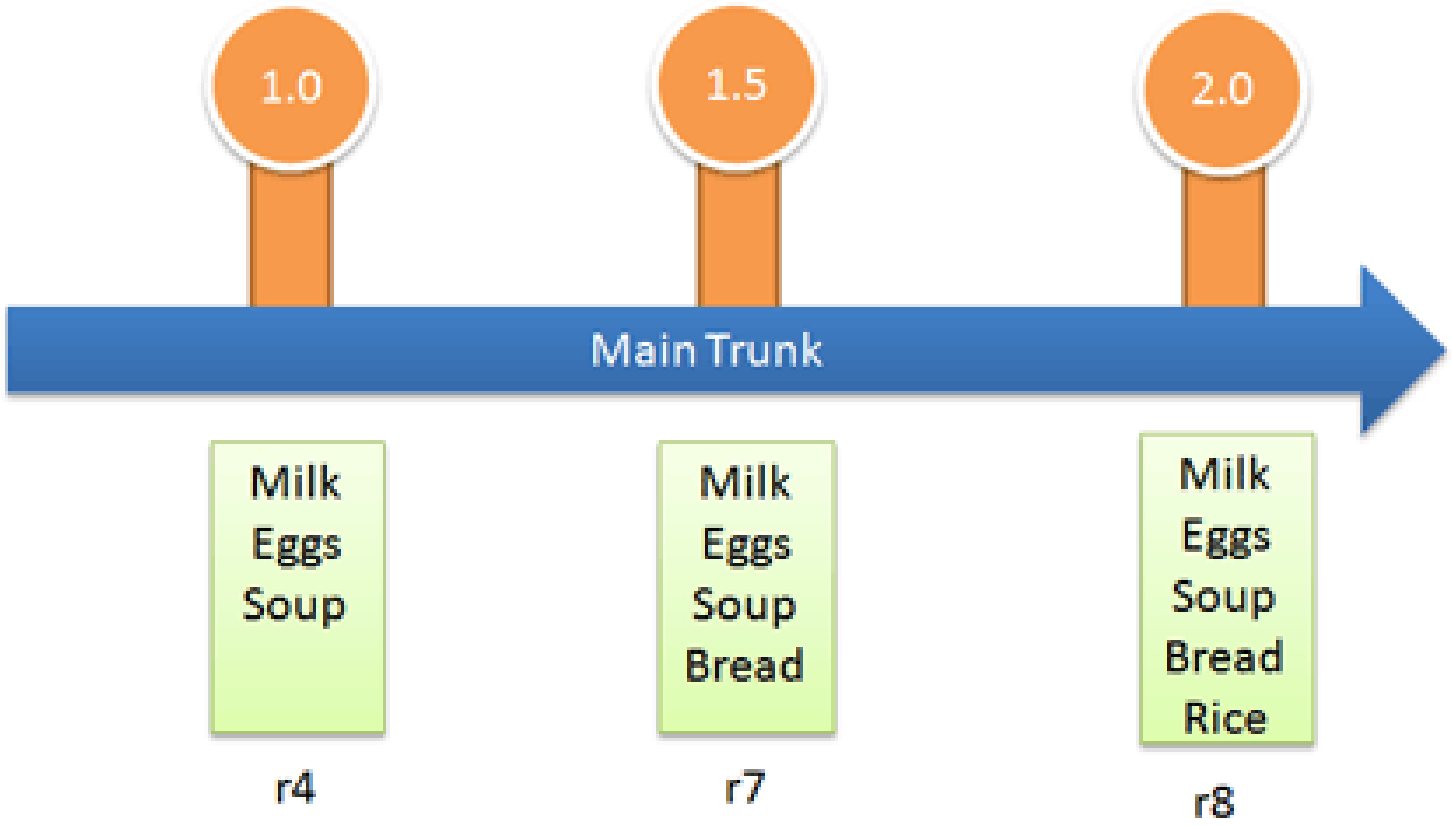



*--- A Visual Guide to Version Control.*

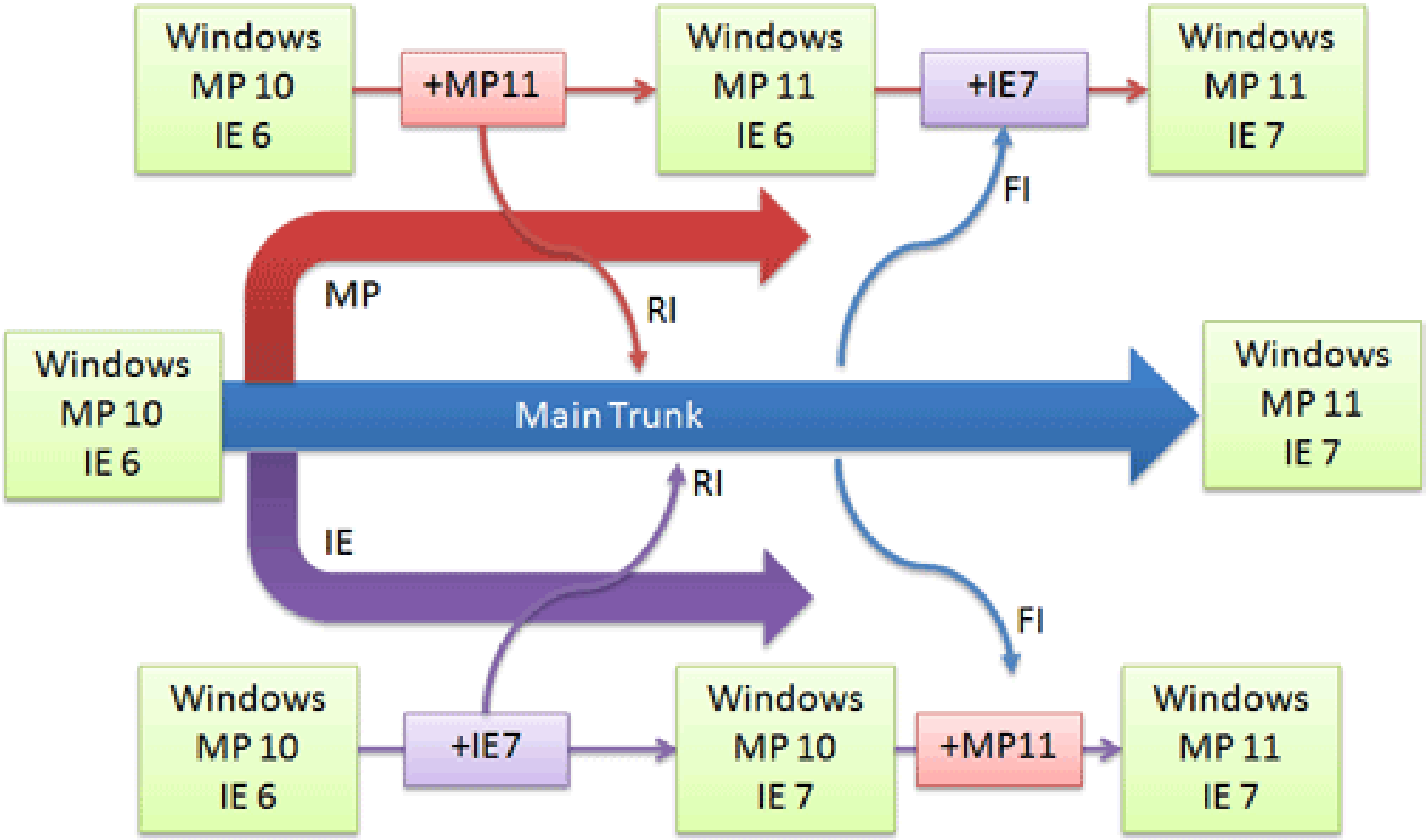
# Conflicts


-Eggs
+Cheese
Valid Checkin
Milk
Cheese
Juice
r3* (Joe)
Milk
Eggs
Juice
Main Trunk
Milk
Cheese
Juice
r3
r4
-Eggs
+Hot Dog
Conflicting Checkin
(Cannot remove eggs)
Milk
Hot Dog
Juice
r3* (Sue)

# Tagging


1.0
1.5
2.0
Main Trunk
Milk
Eggs
Soup
Milk
Eggs
Soup
Bread
Milk
Eggs
Soup
Bread
Rice
r4
r7
r8

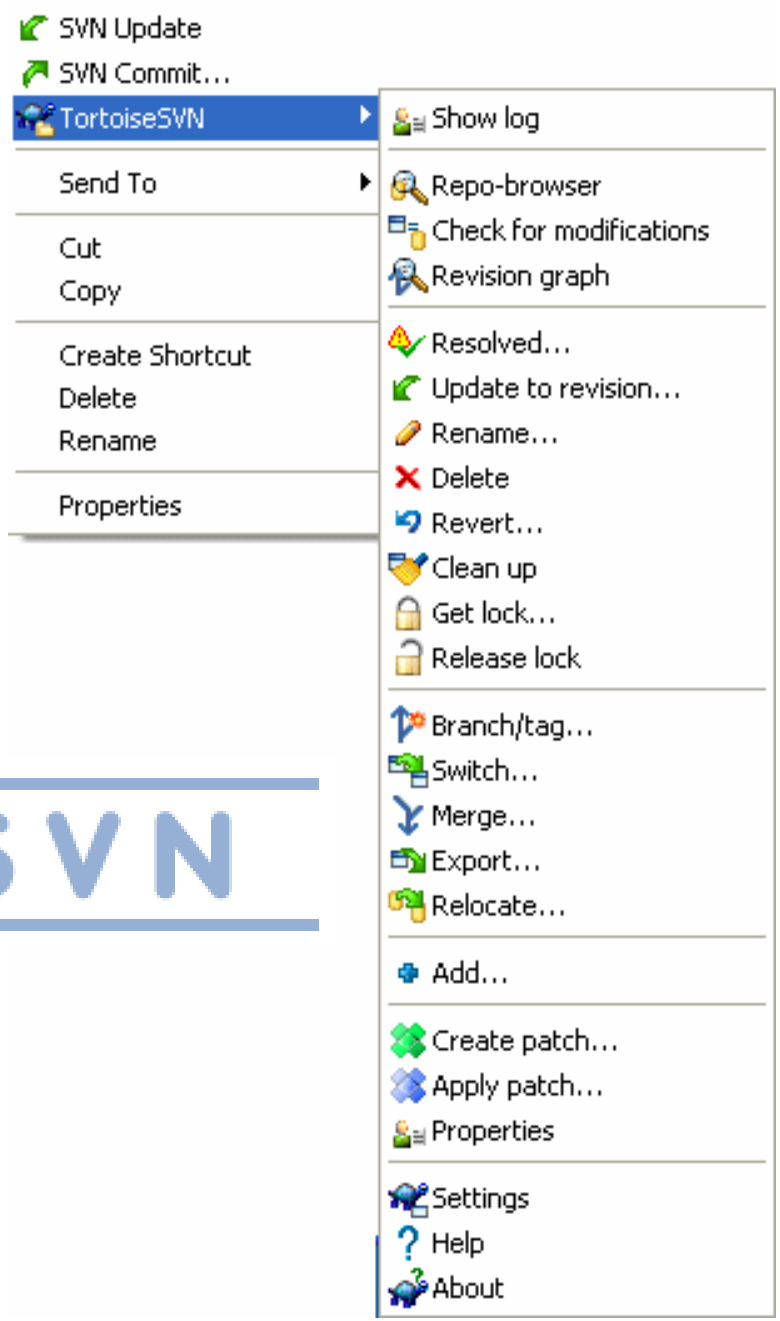
# Managing Windows




Reverse Integration (RI) and Forward Integration (FI)

*--- A Visual Guide to Version Control.*


TortoiseSVN


SVN Update
SVN Commit...
TortoiseSVN
Send To
Cut
Copy
Create Shortcut
Delete
Rename
Properties
Show log
Repo-browser
Check for modifications
Revision graph
Resolved...
Update to revision...
Rename...
Delete
Revert...
Clean up
Get lock...
Release lock
Branch/tag...
Switch...
Merge...
Export...
Relocate...
Add...
Create patch...
Apply patch...
Properties
Settings
Help
About


SysImageList.cpp - TortoiseMerge

File Edit Navigate View Help

SysImageList.cpp

```
56
57      SHGetFileInfo(
58          _T("Doesn't matter"),
59          FILE_ATTRIBUTE_DIRECTORY,
60          &sfi, sizeof sfi,
61          SHGFI_SYSICONINDEX | SHGFI_SMALLICON | SHG
62
63      return sfi.iIcon;
64  }
65
66  int CSysImageList::GetDefaultIconIndex() const
67  {
68      SHFILEINFO sfi;
69      // clear the struct
70      ZeroMemory(&sfi, sizeof sfi);
71
72      SHGetFileInfo(
73          _T(""),
74          FILE_ATTRIBUTE_NORMAL,
75          &sfi, sizeof sfi,
76          SHGFI_SYSICONINDEX | SHGFI_SMALLICON | SHG
77
```

SysImageList.cpp

```
55
56      SHGetFileInfo(
57          _T("blablah"),
58          FILE_ATTRIBUTE_DIRECTORY,
59          &sfi, sizeof sfi,
60          SHGFI_SYSICONINDEX | SHGFI_USEFILEATTRIB
61      return sfi.iIcon;
62  }
63
64  void CSysImageList::Test()
65  {
66      RunTests();
67  }
68
69  int CSysImageList::GetDefaultIconIndex() const
70  {
71      SHFILEINFO sfi;
72      ZeroMemory(&sfi, sizeof sfi);
73
74      SHGetFileInfo(_T(""), FILE_ATTRIBUTE_NORMAL,
75
```

```
»   »   FILE_ATTRIBUTE_DIRECTORY,
»   »   FILE_ATTRIBUTE_DIRECTORY,
```

For Help, press F1. Scroll horizontally with Ctrl-Scrollwheel | Left View: ASCII CRLF / - 16 | Right View: ASCII CRLF / + 15 | Conflicts: 0 | CAP NUM SCRL