FROM RESEARCH TO INDUSTRY

Professional Source Code Management with Pharo

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Source Code Management in Pharo

- Pharo has native tools for version control
  - Monticello
  - Metacello
- That is:
  - Packages
  - Versionning (history)
  - Merging
  - Configurations
  - Scripting configurations
  - Remote / local repositories

Source Code Management in Pharo

- Monticello
  - A package is a .mcz, a zip file containing
    - a binary snapshot (for the current version)
    - a source snapshot (for the current version)
    - metadata: the version
    - the version history
  - Mcz is named: package-author.versionNo.mcz
  - A package contains only the current version code
    - even if the version metadata contains the versionning history
  - There is no explicit support for branches
    - System only represent an author and a version number
    - Versions have UUIDs
    - But they are not allways used: select by file name often
      - Two different packages versions may have same name but different UUIDs

Source Code Management in Pharo

- Monticello
  - Merge
    - Three way merges:
      - between two versions, find a common ancestor : the merge version starting point
      - apply changes from ancestor to each version in the merge version
      - if both versions have changes at the same place : merge conflict: ask user
    - Three way merge is the standard, modern feature of version control system
    - Require access to all history...
      - which is not guaranteed in Monticello repositories: merge failed for missing history
  - Branches
    - Supported but ... not obvious.
      - Not apparent in the tools, not apparent in the package name.

Source Code Management in Pharo

- Metacello
  - Notion of a version of a project
    - Tie one package (or multiple packages) to a single point
      - A release tag ?
      - v1.0
      - stable
      - bleeding edge
    - A configuration object
      - More about that later
  - Load a configuration version:
    - load all refered packages at a specific point
    - or the latest version of all (development or bleeding edge)
  - Can track dependencies
  - Fairly complete and complex

Source Code Management in Pharo

- Scripting
  - Gofer

```
Gofer it
    url: 'http://smalltalkhub.com/mc/Pharo/MetaRepoForPharo30';
    package: 'ConfigurationOfRoassal2';
    load
```

  - Metacello
    - an example later ...
- Remote repositories, hosting
  - Squeaksource / Smalltalkhub
  - FTP / HTTP

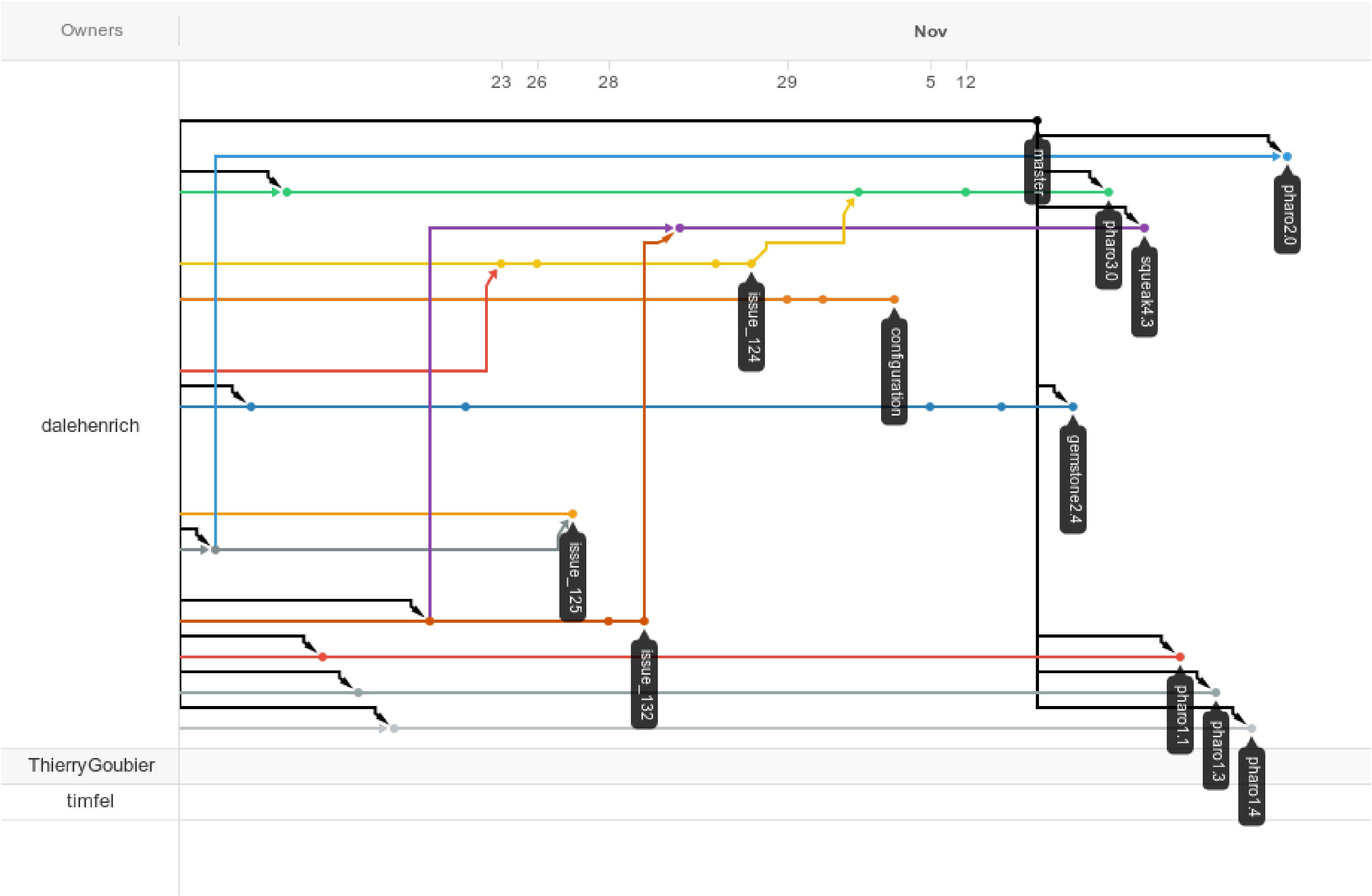
Professional Source Code Management

- Professional Source Code Management ?
  - What is in use in the Company trying / using Pharo!
    - RCS / Software Configuration Management
  - Can't be changed.
  - Is tied to the company
    - Coding / development rules
    - Culture
    - Quality process
  - Can Pharo adapt:
    - Yes!
    - But pay attention to features and processes
      - Is Monticello or our tools up to date?

Professional SCM with Pharo

- Professional SCM features
  - Branches
  - Control
  - Integration
- Branches
  - Multiple branches for usual work
  - Three broad categories
    - Releases
    - Bug fixes
    - Development(s)
  - More or less flexible
  - Integrated tagging
    - release points, snapshots, baselines

Example: a bit of FileTree



Professional SCM with Pharo

- Control
  - Who is in charge of integrating / releasing
    - Not collegial but hierarchical
  - Enforced by the tools ?
- Integration
  - merge
  - reviews
  - tests
    - fairly "company culture"

Professional SCM with Pharo

- How Pharo fits in?
  - Format: all RCS are text oriented
    - FileTree
      - Map a Monticello package onto text files
      - Everything: methods, class definitions, class comments, extensions, version history
      - Standard on Pharo >= 3.0
      - Integrates into Monticello / Metacello
  - Merge: the RCS should merge, not Monticello
    - For correct tracking and sync with the non-Pharo part of the project
    - Merge may not work properly over Smalltalk code and metadata
      - Merge conflicts.
  - Commit and all operations of the RCS
    - Done outside Pharo

Professional SCM with Pharo : Git

- Pharo + FileTree
  - One package = one directory in the git repository
  - Multiple packages inside a FileTree repository directory in the git repository
    - Multiple FileTree repositories possible inside the git repository
  - Git use on the command line
    - clone commit checkout branch push pull merge ...
    - or on the GUI: meld, gitg, gitk, ...
  - Can combine with Makefiles
    - To build a customized Pharo image: versionned configuration management
  - Fit within any workflow with git
    - Issue 1: desynchronisation between Monticello and git repository
    - Issue 2: merge conflicts with the Monticello metadata in FileTree

Professional SCM with Pharo: Git

- Pharo + FileTree + Branches
  - Shows only the branch history
  - Isolate from changes on other branches (team work / features / bug fixes dev)

Professional SCM with Pharo: Git

- Pharo + FileTree + Branches + Baseline
  - Baseline
    - Current project configuration is top of the branch
    - Just list packages in the Baseline
    - Store Baseline as FileTree inside that branch

```
Metacello new
        baseline: 'AltBrowser';
        repository: 'filetree://home/thierry/src/AltBrowser';
        load
```

    - will work on the pharo3.0 branch, will work on the pharo4.0 branch, etc...

Professional SCM with Pharo: Git

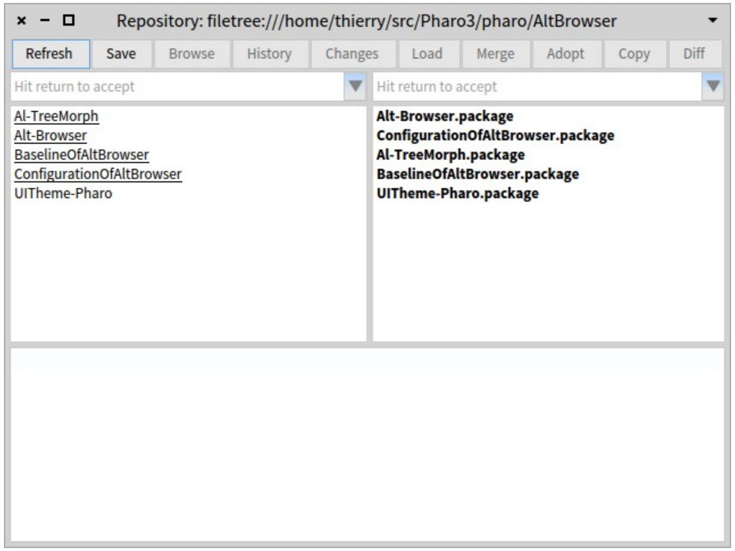
- Pharo + FileTree + Branches + Baseline + Metacello
  - Deployment with specific large scale repositories
    - A Baseline per branch /= per tag (semantic versions)
    - github:// urls for github.com projects (bitbucket:// urls for bitbucket.org)

```
Metacello new
        baseline: 'SmaCC';
        repository: 'github://ThierryGoubier/SmaCC:v2.0.4';
        load
```

  - Configurations?
    - Just point to the right branch or version tag, load baseline.
    - With qualifiers, can track bugfixes /minor releases
      - (v2.0.* will track 2.0.4, 2.0.5 ...)

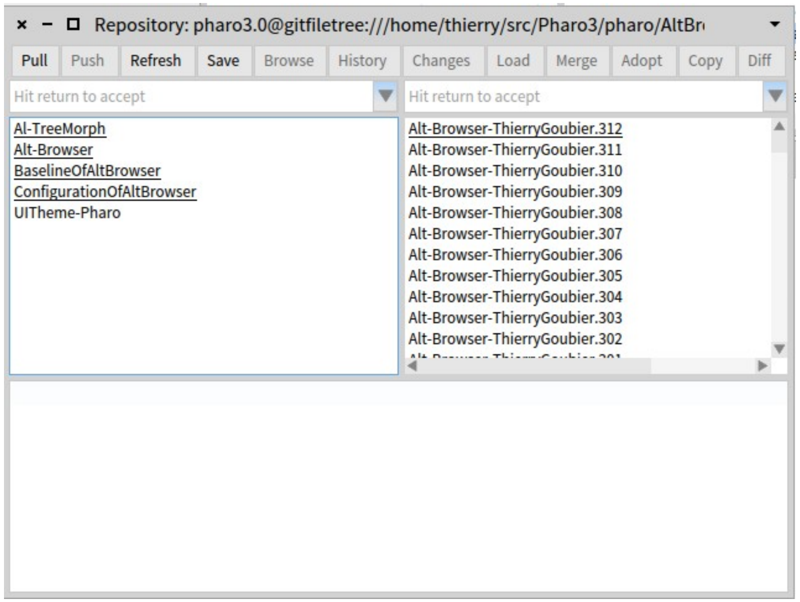
Professional SCM with Pharo: Git

- Pharo + FileTree + Branches + Baseline + Metacello + GitFileTree
  - Automate usual Git commands from Pharo
    - clone push pull commit checkout
  - Extract Git versionning info inside Pharo
  - Avoid desynchronisation / simplify workflow


Repository: filetree:///home/thierry/src/Pharo3/pharo/AltBrowser

AI-TreeMorph
Alt-Browser
BaselineOfAltBrowser
ConfigurationOfAltBrowser
UITheme-Pharo

Alt-Browser.package
ConfigurationOfAltBrowser.package
AI-TreeMorph.package
BaselineOfAltBrowser.package
UITheme-Pharo.package


Repository: pharo3.0@gitfiletree:///home/thierry/src/Pharo3/pharo/AltBr

AI-TreeMorph
Alt-Browser
BaselineOfAltBrowser
ConfigurationOfAltBrowser
UITheme-Pharo

Alt-Browser-ThierryGoubier.312
Alt-Browser-ThierryGoubier.311
Alt-Browser-ThierryGoubier.310
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Alt-Browser-ThierryGoubier.302

Professional SCM with Pharo: Git

- Pharo + FileTree + Branches + Baseline + Metacello + GitFileTree + MergeDriver
  - Add a merge driver to git to handle merges of Monticello metadata
    - Command line tool written in Pharo,
    - Used in non-Pharo projects :)
  - Resolve merge conflicts
  - Experimental?

Professional SCM with Pharo: X

- Pharo + FileTree + Branches + Baseline + Metacello + ... for X
  - Where X is SVN, mercurial, bazaar, CVS, etc...
- Git integration:
  - Template for integrating external RCS commands
  - And extracting version info from the RCS inside Pharo
- Can be reused for X
  - Base: Monticello + FileTree + Metacello + Baseline
  - Estimation : 1, 2 man month work (adaptation of existing template)
- Not the same issue as
  - Moving Pharo development to Git / Github.

Thank you

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