Migration of the Gaudi and LHCb Software Repositories from CVS to Subversion

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Outline

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Why migrate to Subversion?

What's wrong with CVS?

- Subversion was developed to replace CVS overcoming its limitations (see Subversion's History)
- stable and mature product (started in 2000)
- CERN IT started a Subversion service
  - planned stop of the CVS service

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Subversion Philosophy

From the Subversion F.A.Q.

Interface to the repository

[. . .] Subversion's repository interface [. . .] is a "versioned filesystem" in the sense that it stores a directory tree whose state is remembered from revision to revision. [. . .] this particular filesystem doesn't lose data when written to; old tree states can be retrieved as easily the most recent state.*

Tags and branches

[. . .] branches and tags are conventions built on top of copies, instead of being basic concepts built into Subversion itself [. . .]*

Subversion vs. CVS

CVS

- history of single files
- directories in the repository to emulate structure
- logical names (tags) to identify special revisions

Subversion

- history of the repository as a whole
- efficient storage of copies
- no built-in concept of tags
- atomic commits
- meta-data (properties)

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Importance of the Structure

Subversion doesn't have built-in *tags* and *branches*

- *emulated* with copies
- conventional names (not enforced)
  - trunk: main development
  - tags: copies meant to be stable
  - branches: copies for parallel work
- conventional structure fits simple projects
  - tags can be created only for directories

    ```
    svn cp svn://myrep/trunk svn://myrep/tags/v1r0
    ```
- large/complex projects need several level of tags
  - projects, modules, submodules...

LHCb Needs

LHCb Software Development Scheme:

- Packages
  - smallest tagged units
- Projects
  - flexible collection of packages
- Repository
  - One repository to host several projects

Project tags are used to refer to version of the packages

- custom tool to check out packages and projects

Special use-case: check out projects with plain cvs/svn

- need for project tags encompassing the packages

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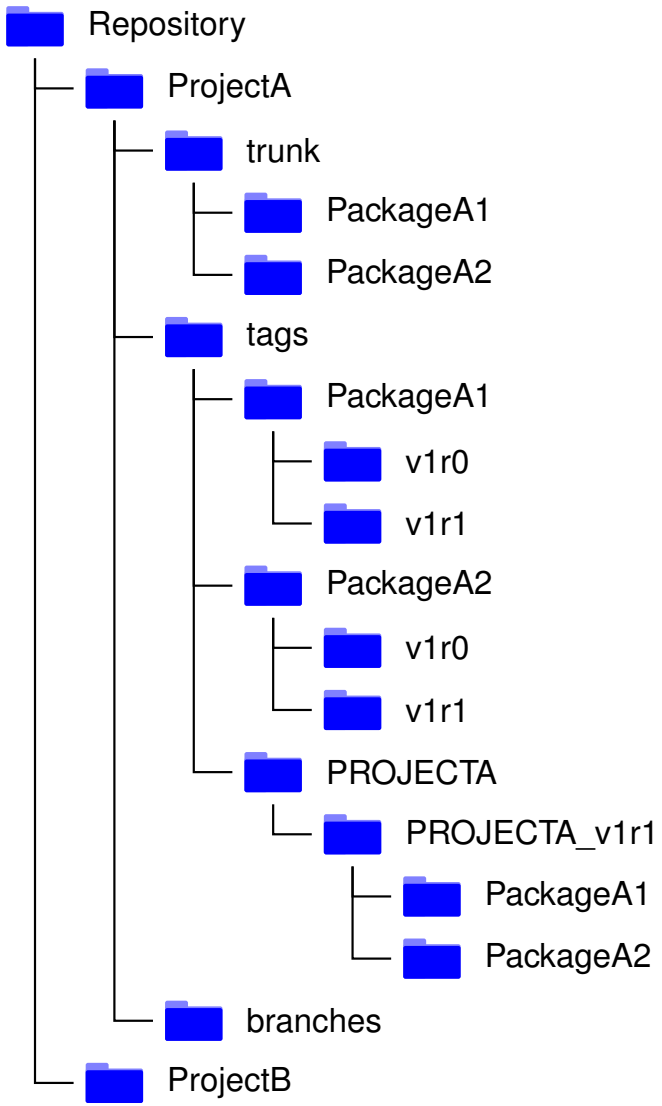

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- Main development line
  - packages
- Tags
  - package tags
  - project tags
- Branches
- Meta-data for efficient look-up

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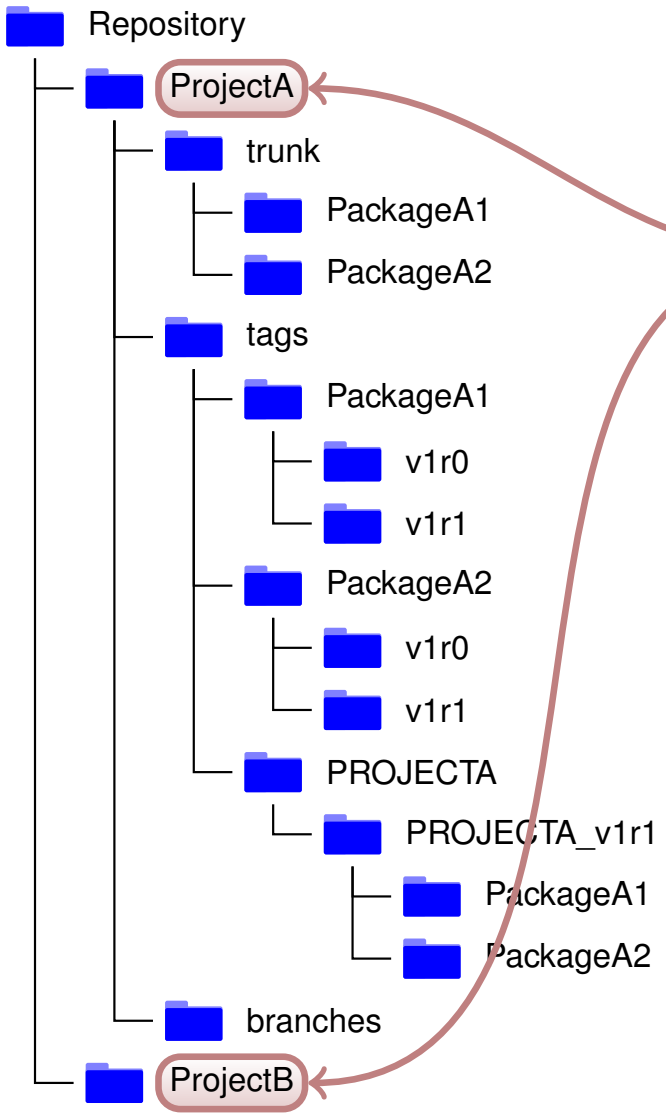

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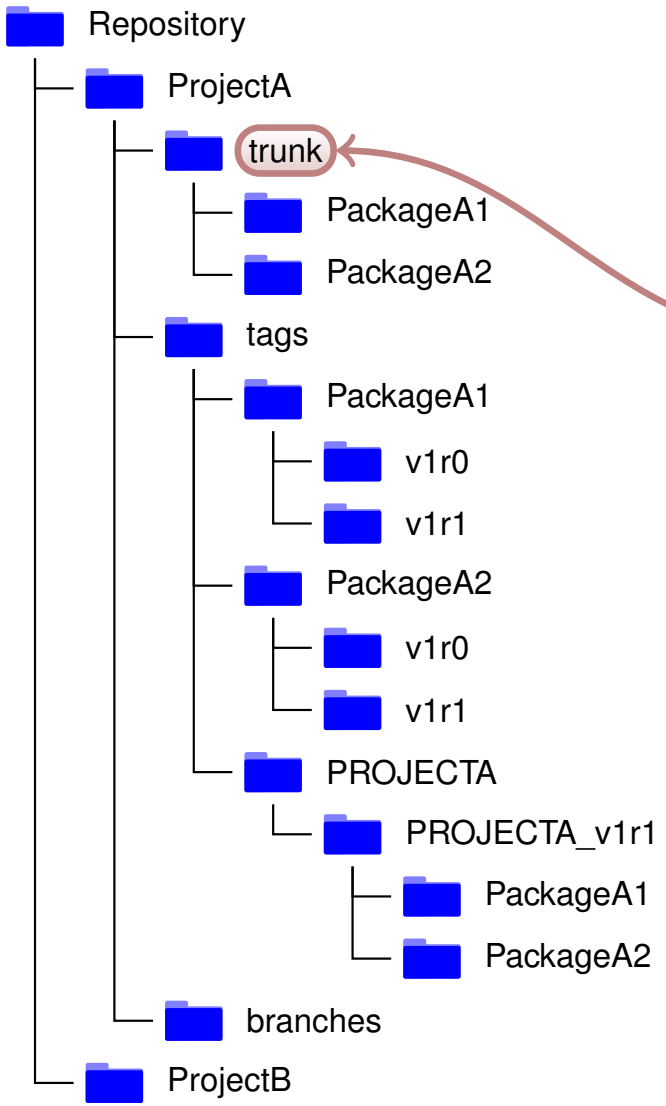

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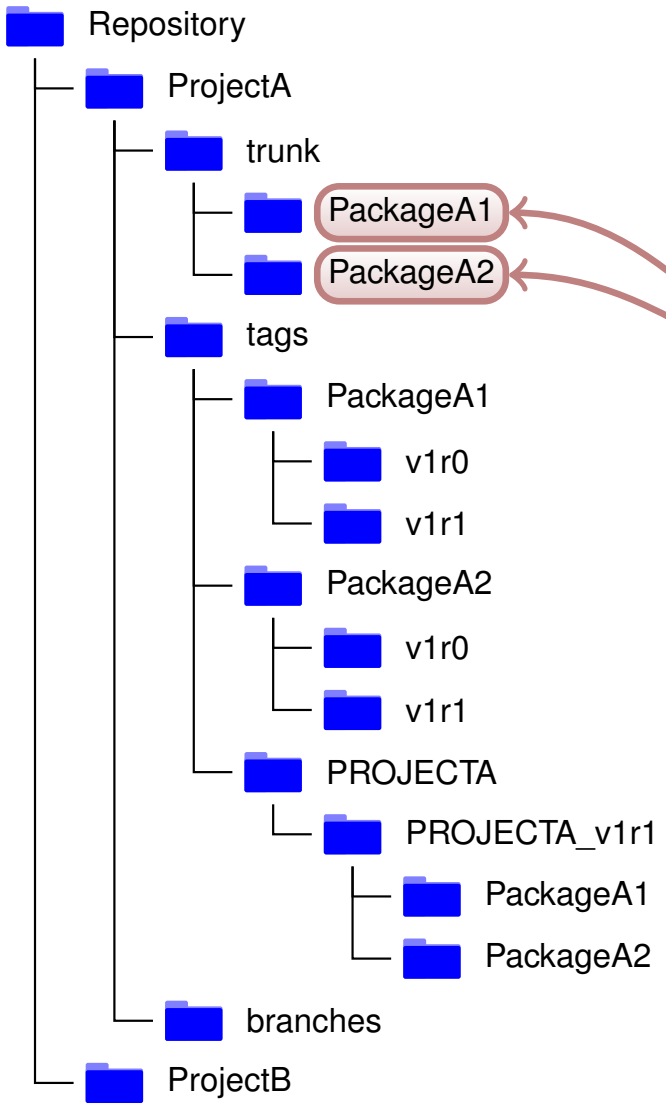

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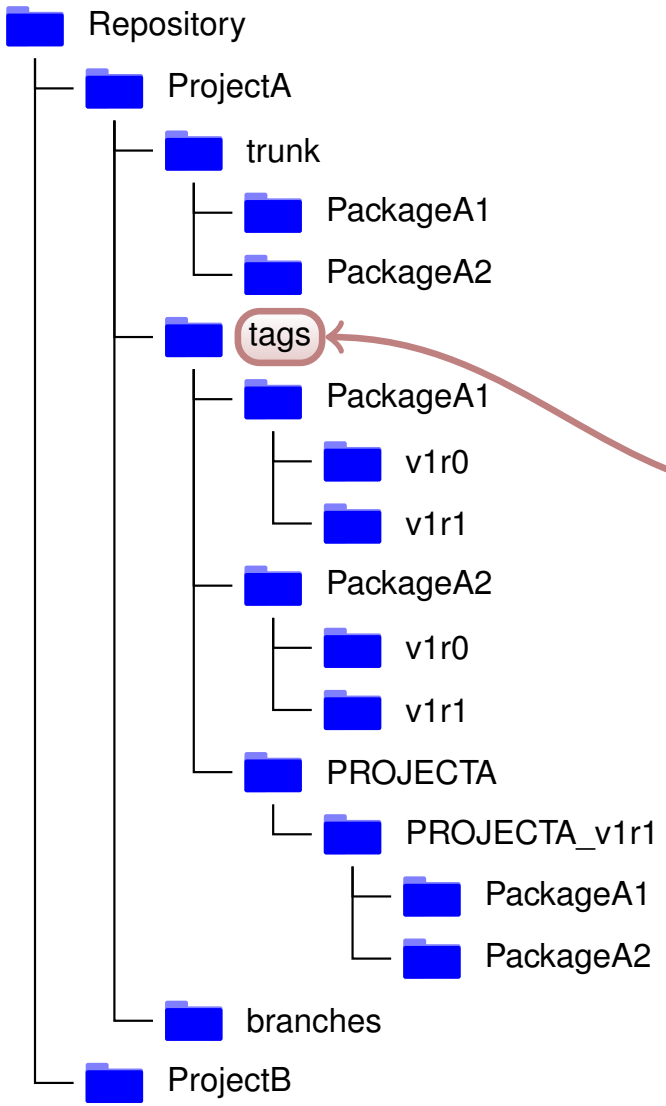

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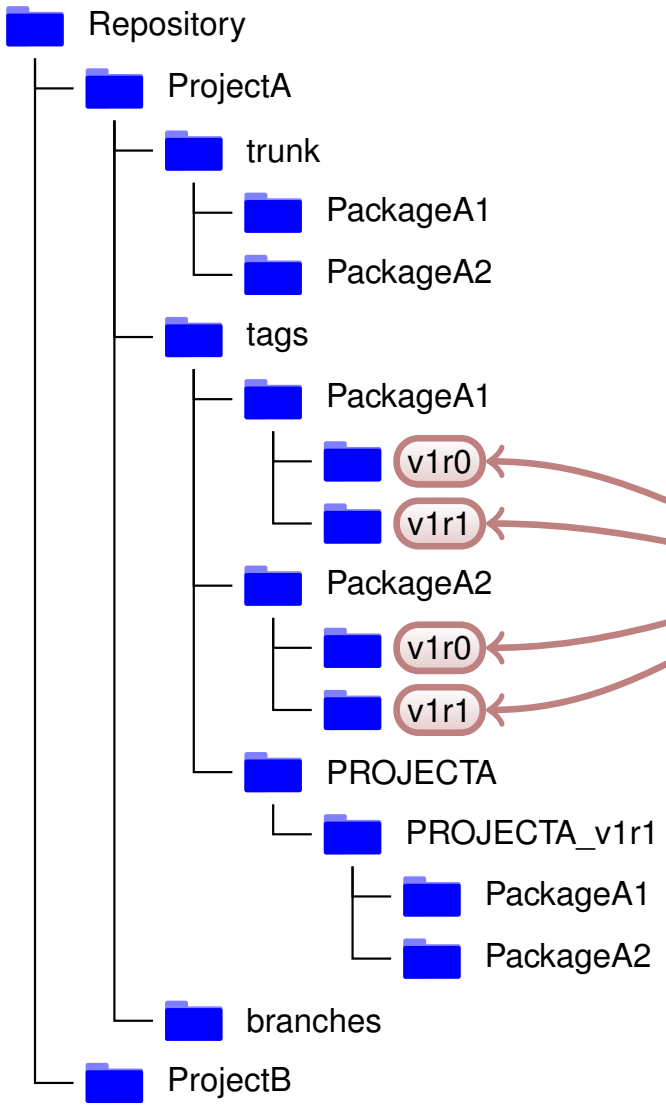

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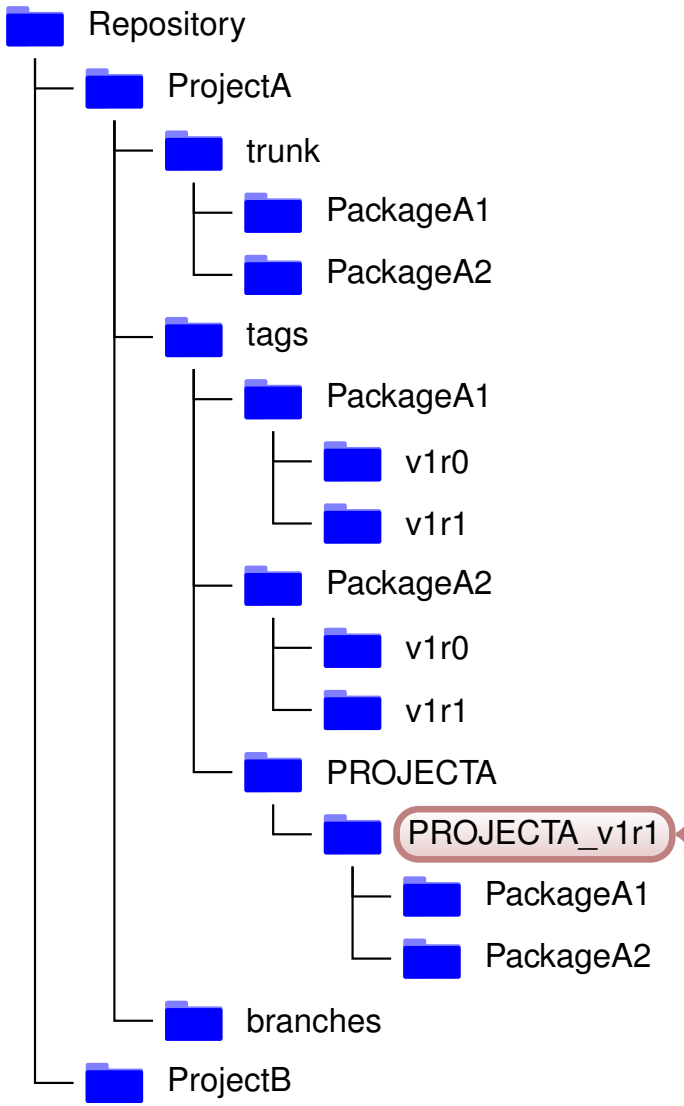

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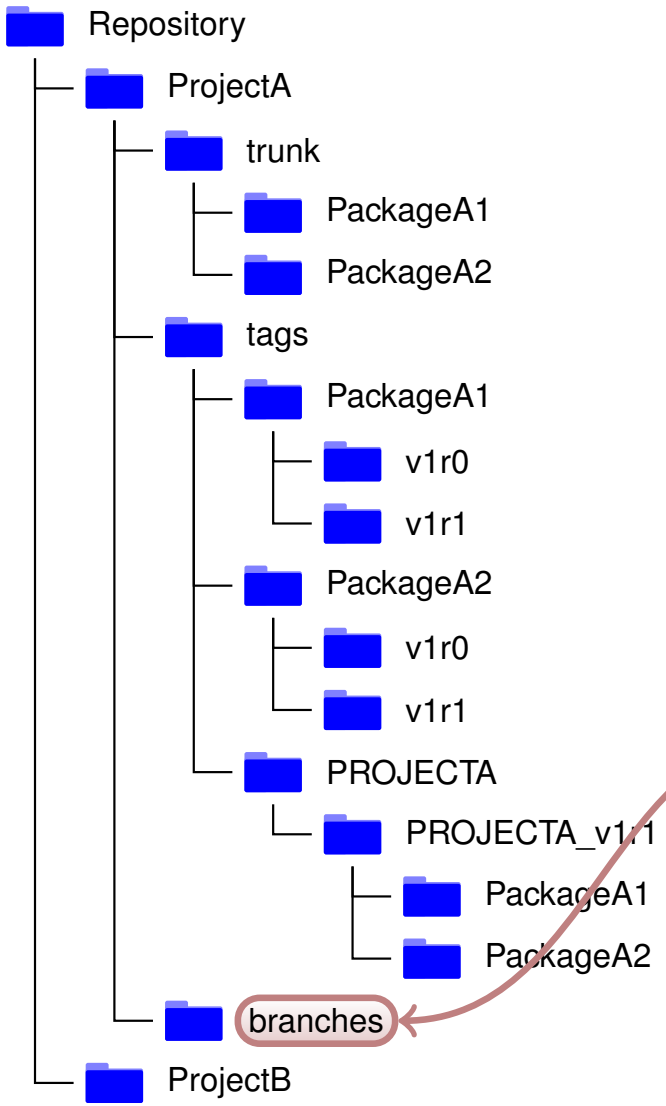

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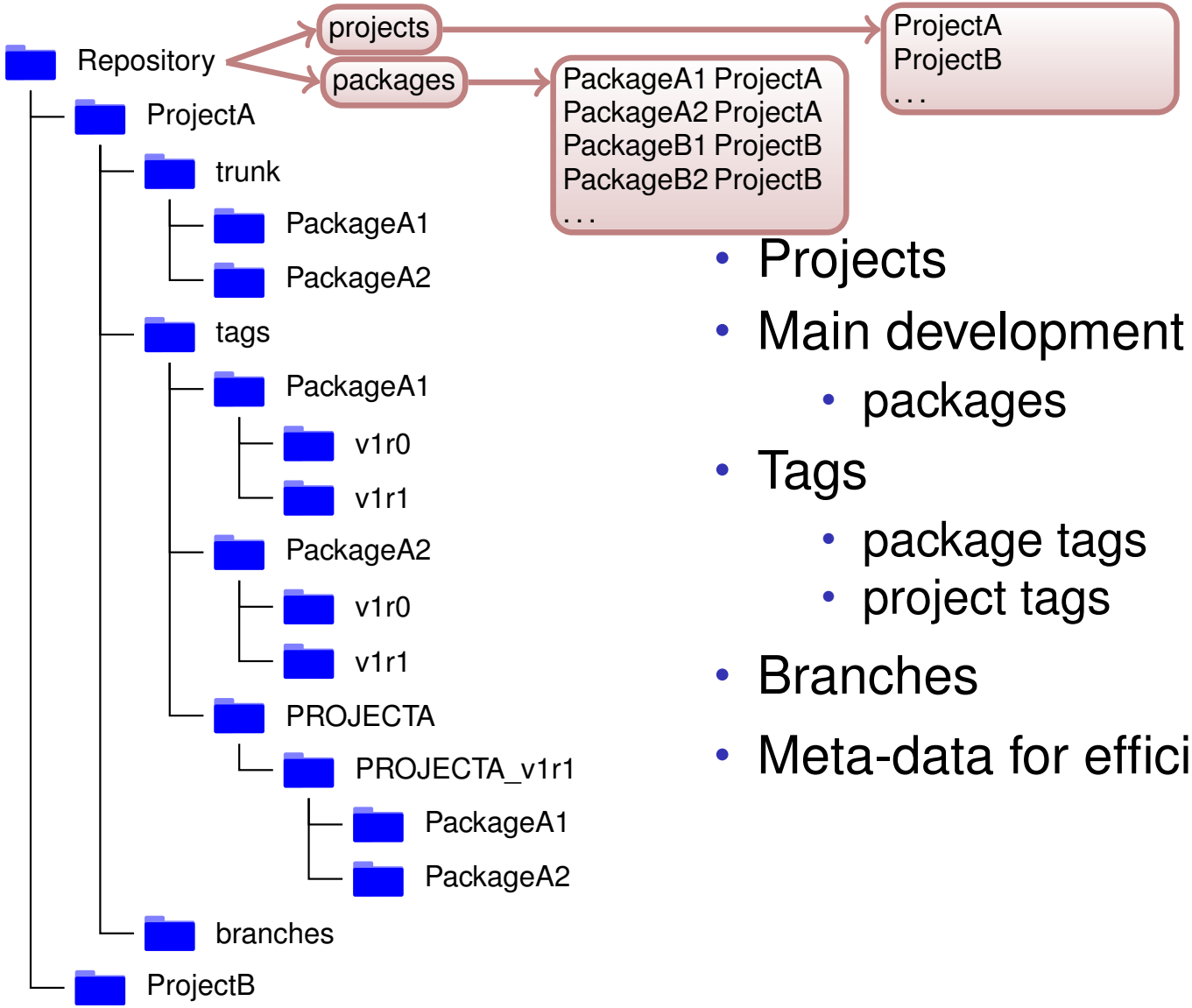

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Helping the Users

The most affected by a migration are the users

- Most common use cases
  - check out packages and projects
    - already existing tool for check out
  - commit
  - tag
- For a smooth migration
  - update the check-out tool to work with CVS and Subversion
  - prepare new tools to flatten out the differences
- User support
  - Tutorials
  - Up-to-date instructions

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Planning

- *Incremental* migration
  - coexistence of CVS and Subversion
- First packages/projects on a volunteer basis
- Dead-line for the complete migration
  - flexible, migration agreed with project managers

Procedure

The librarian takes care of migrating the packages/projects.

- Template configuration for `cvs2svn` (Python)
  - insert the packages and projects to migrate
  - the actual configuration computed automatically
- Well defined steps
  - announce migration
  - lock write access to CVS for the packages
  - generate dump with `cvs2svn`
  - filter the dump to remove unneeded parts
  - prepare the structure in svn repository
  - load the dump into svn repository
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- . . . the migration requires careful definition of the structure.
- It's useful to wrap the conventions in custom tools
  - mandatory for incremental migration.
- The migration of the LHCb software almost completed
  - 27 projects out of 28 migrated (645 packages)
  - completion scheduled for December

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