GIT In The Build Service

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Overview

Build Service
Work Flows
Current Implementation
Problems
How can GIT help?
Status

Build Service

Build Service

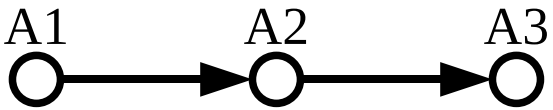
- Packages, organized in projects
  - Source repository
  - Binary package repositories
- Scheduling package builds, building, storing the results

Source Repository

Contains the sources of packages

Similar architecture as CVS/Subversion:

- Revisions identifying different versions
- Linear history



Work Flows

Work Flows

Change your own package

Change somebody else's package

Create a derived package

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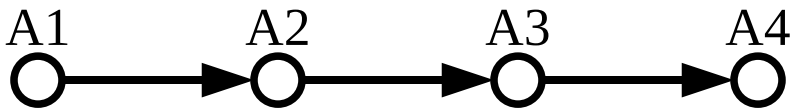
Change your own package

Make changes in A:

- Check out A3
- Make local changes
- Commit the result, which becomes A4



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Change somebody else's package

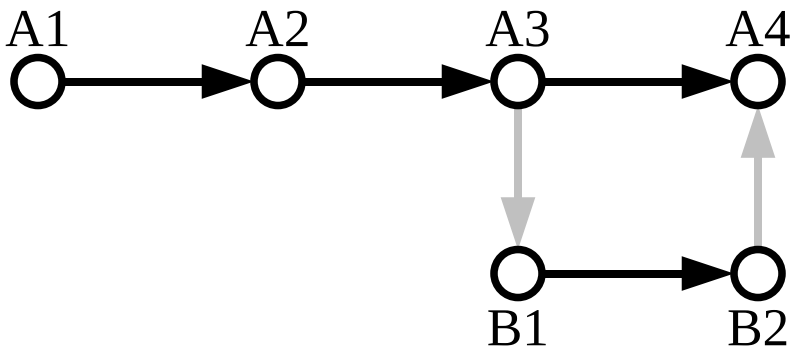
Create a copy (B)

- “osc branch” or “osc linkpac”

Make changes in B

Submit / accept changes for A

- “osc sr”



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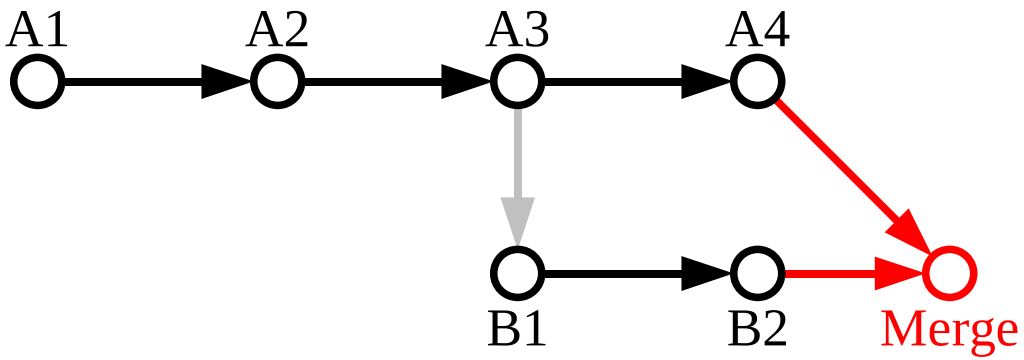
Create a derived package

Create a copy (B)

- “osc branch” or “osc linkpac”

Make changes in B

When someone changes A, a merge of A4 and B2 will be built (but not checked into B)!



Current Implementation

Current Implementation

Packages with a linear history

- Sequence of revisions
- Naturally fit for the CVS/Subversion model

Branching and merging

- Implemented with “Links” / “source links” / “linked packages”
- Links are unique to the build service

Links

Implementation

How they break

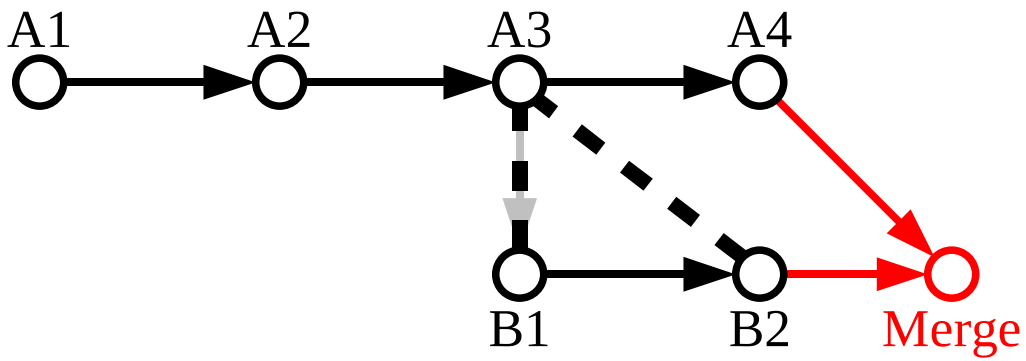
Why they cause spurious commits

Links: Implementation

"Creating a copy" as above is implemented as a link internally.

Revisions in links are stored as diffs

The Merge operation is implemented by applying the diff to a new base revision



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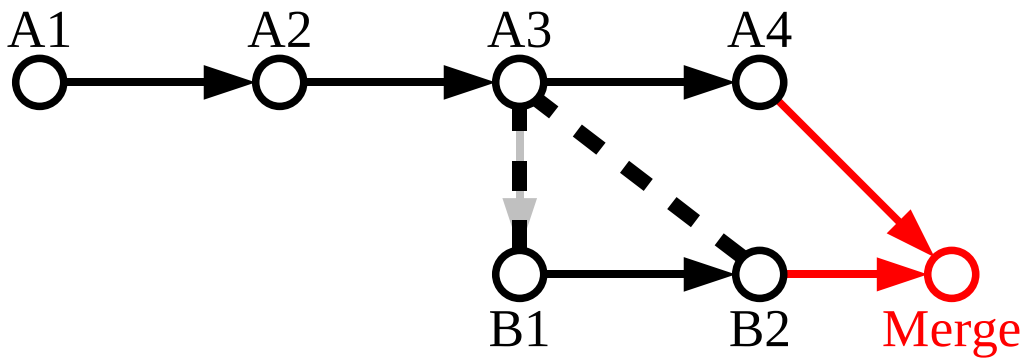
Links: How they break

Conflicting changes

Currently, “osc” always checks out what would be built (Merge from previous slide)

- You don't get out what you've put in
- Links may break and need “repairing”
- Weird, but could be fixed in osc (“osc merge”)



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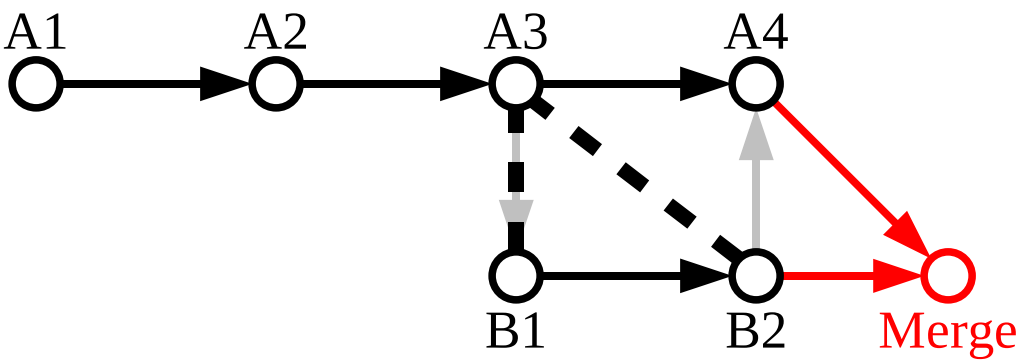
Links: Spurious commits

Commits with comment “auto commit by copy to link target”

- After a merge (“osc sr accept”), the link would break
- The build service creates a commit itself
- Proper parent tracking would solve this problem



Problems

Source Repository: Problems

- Not a Distributed VCS
- No proper parent tracking when merging
  - Spurious commits
  - Spurious merge conflicts
- Implicit merging in osc: surprising, “osc repairlink”
- Loss of history when linking/copying packages
- Homegrown, no dev community, few resources
- Missing features

How can GIT help?

Idea: Use GIT in the Build Service

- Very efficient, distributed VCS
- Disconnected operation
- Extermely powerful merge features
- Various command line and GUI clients, web frontends to choose from
- Active development community

How To Get There?

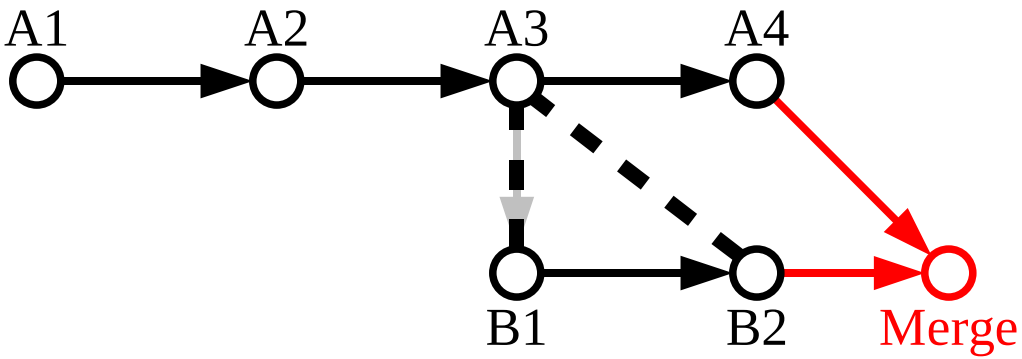
- Write a converter / import utility
  - Normal packages are easy to deal with
  - Figure out how to deal with links
- Support git as a backend format
- Extend the on-the-wire protocol

Status

- A GIT client has been implemented
  - Serves as a converter into git format
  - Supports source links
  - Can be used standalone
  - Push to build service => some information lost
  - Not integrated with osc, yet
- But: no resources for the backend changes at the moment ...

How to deal with links?

- Expand links during the import into git
- Stop thinking of links as diffs
- Proper parent tracking
  - Instead of applying a diff, a real merge can be done



Wrap-up

- GIT Client available at:
  - OBS @ home:agruen:Factory/bsgit
  - http://gitorious.org/opensuse/bsgit

Questions?

Volunteers for backend work, osc intergation, ...?

Thank you for your time!

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