UNIVERSITY OF AGDER

TCLT - Test Centered Learning Tool

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Project background

Fjelltools Vri project - 2010

- Spiritual predecessor to TCLT
- Local industry and UiA partnership
- Goal: Select a toolset for use in computer science courses

Result

- Atlassian Suite of tools available for all students
- Jira - Issue tracker and project management - Tempo plugin for time logging
- Stash - Git version control hosting server
- Confluence - Wiki for project collaboration
- No license fees for classroom use

Today

- 80+ student projects in progress/completed so far
- Hosted at https://tools.uia.no

TCLT goals

Test Centered Learning Tool (TCLT) aims at enabling students to work in a test-driven environment. The key aspects are:

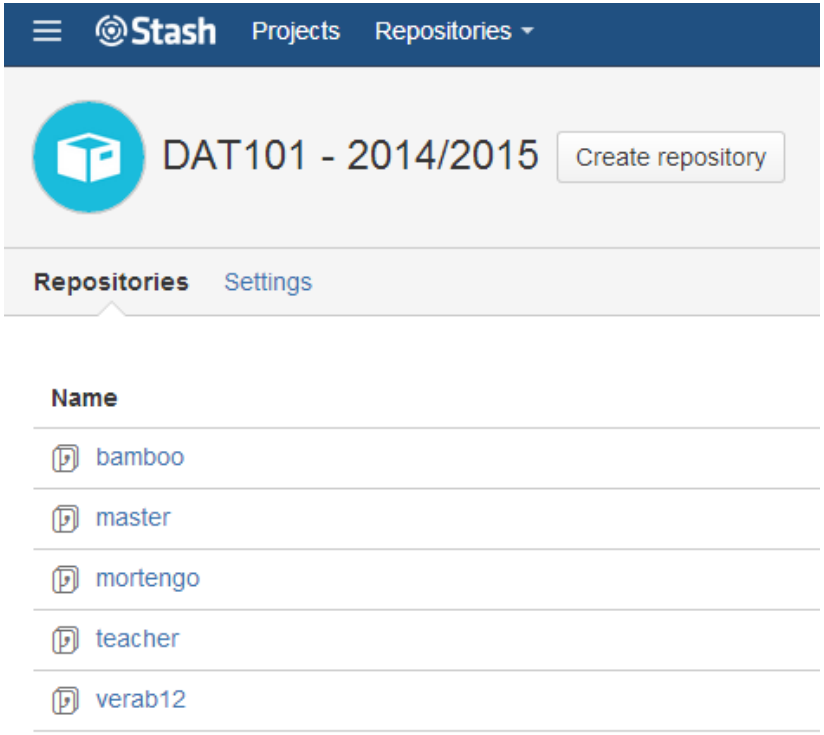
- The students automatically get response on assignments handed in. This alternative form of learning enables students to learn at their own pace and at their own time.
- The students work in an industry-like interactive test driven development.

This is a blended learning approach where the students, in addition to formal feedback on the assignments, get customised response such as videos and online resources.

Note: TCLT builds on the tools already in service at UiA. The experience we have had so far is not tied to a specific vendor but some of the technical work is.

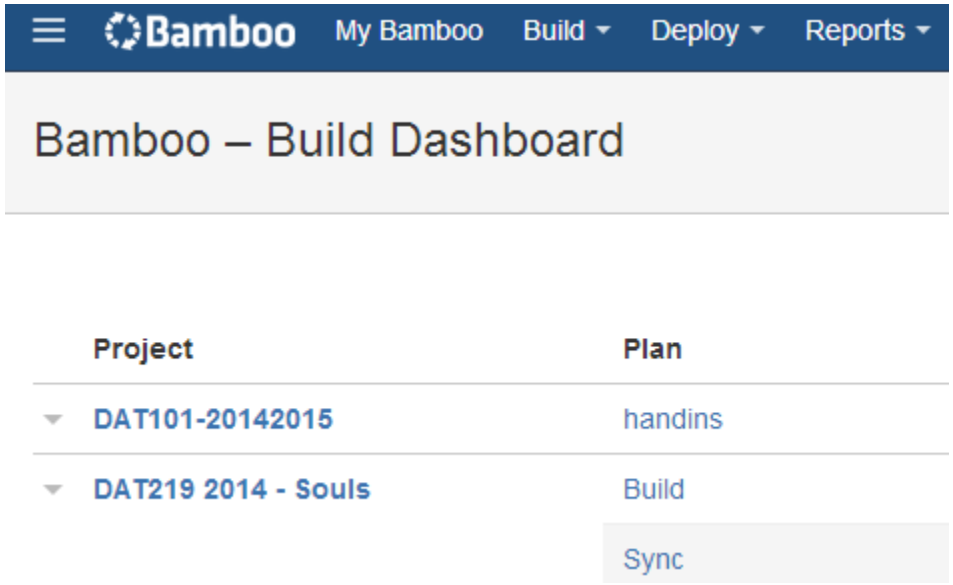
Stash

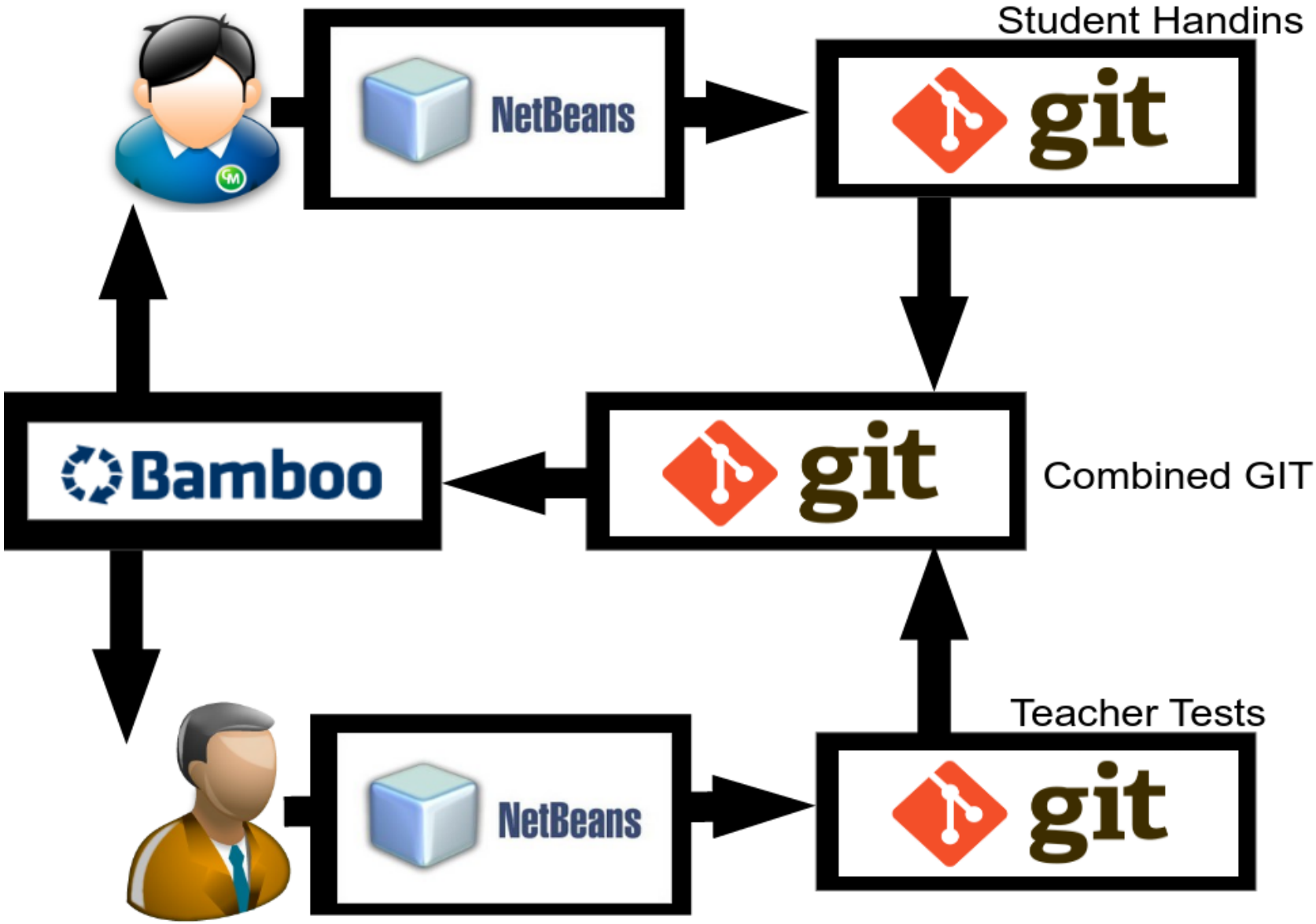
- Git version control hosting server
- Repositories are organized in projects
- Access control on either project level or repo level
- Built in pull request / peer review features



Bamboo

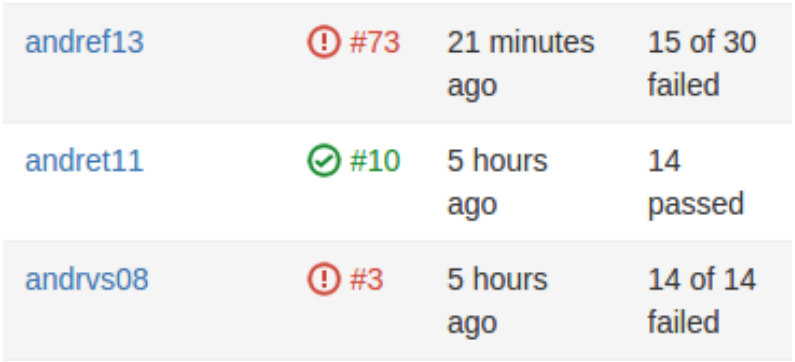
- Also from Atlassian
- Build / continuous integration server
- Projects consist of one or more plans (recipe)
- Fetches code from Stash then builds and tests it
- The plan defines how the code is built and tested
- Shows the result by parsing the test report (e.g. JUnit XML)



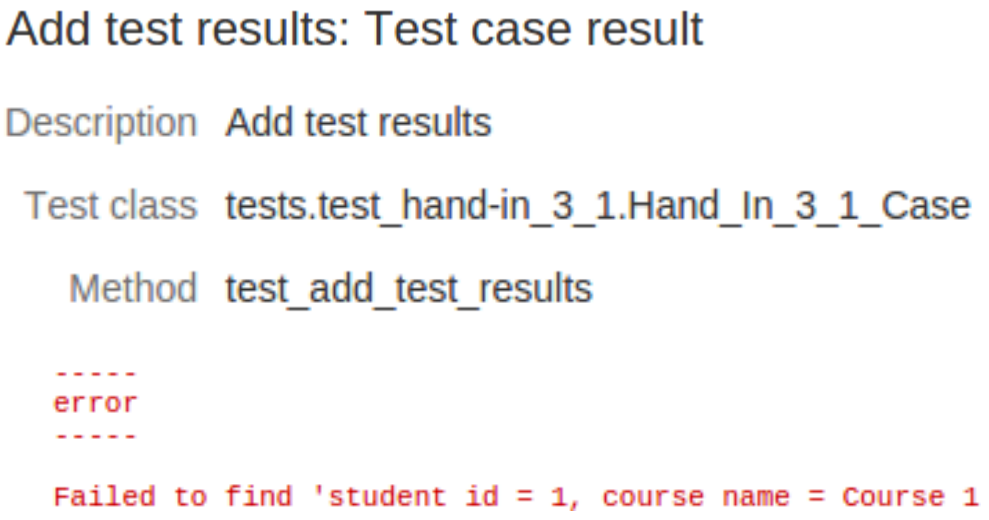

Student Handins
NetBeans
git
Bamboo
git
Combined GIT
Teacher Tests
NetBeans
git

Student experience

- Each student has their own branch plan
- The student can run (press play) this plan at any time
- Number of passed / failed tests show once testing is done
- Clicking a test gives details



Branch overview



Test details

Results so far

Advantages

- Students gain practical experience with software development tools
- Teachers gain practical experience with software development tools
- Students get instant feedback on their deliverables
- Teachers can spend more time with students once tests are written
- Very little to maintain so far - mainly updating tools

Challenges

- Students are introduced to multiple tools at once
- Continuous integration tools aren’t “nice” - 14 of 14 failed
- Output from unit tests aren’t beginner friendly
- Writing tests can be time consuming up front