

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:

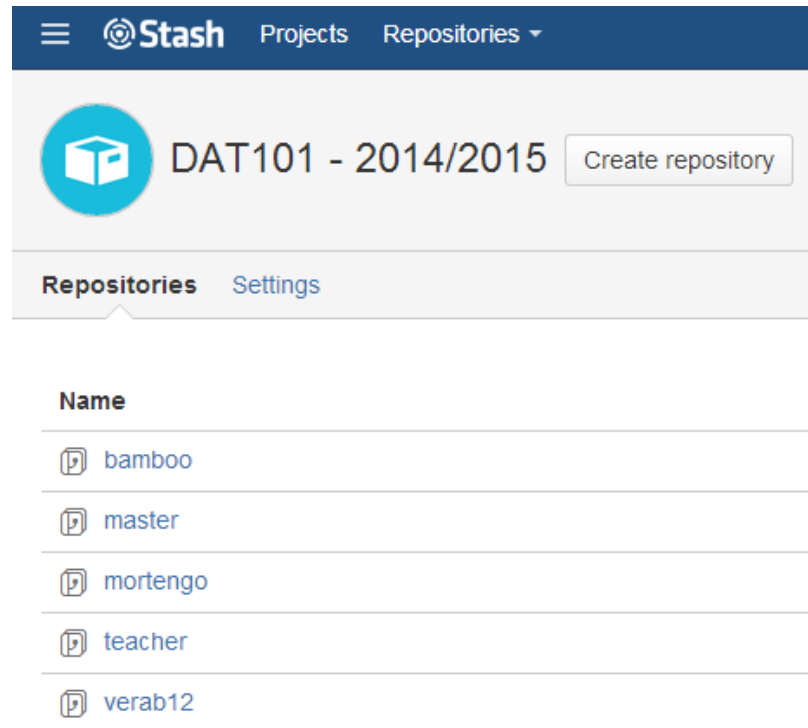
- The students automatically get response on assignments handed in. This alternative form of learning enables students to learn at their own pace and at their own time.
- The students work in an industry-like interactive test driven development.

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

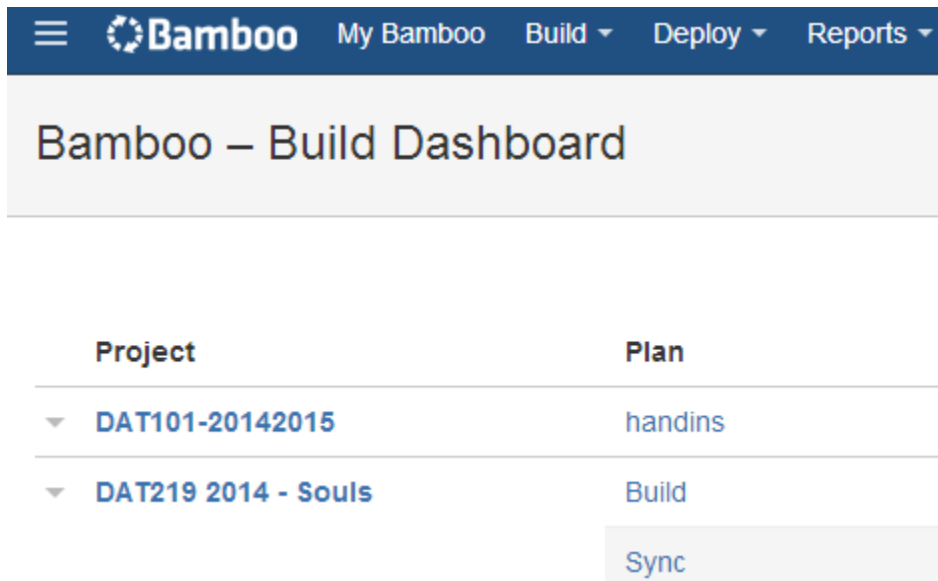


The screenshot shows the Stash web interface. At the top, there is a dark blue navigation bar with the Stash logo, a hamburger menu icon, and the text 'Projects' and 'Repositories'. Below this, the main content area shows a project named 'DAT101 - 2014/2015' with a blue cube icon and a 'Create repository' button. Underneath, there are two tabs: 'Repositories' (selected) and 'Settings'. A list of repositories is displayed below, each with a small icon and a name:

Name
bamboo
master
mortengo
teacher
verab12

Bamboo

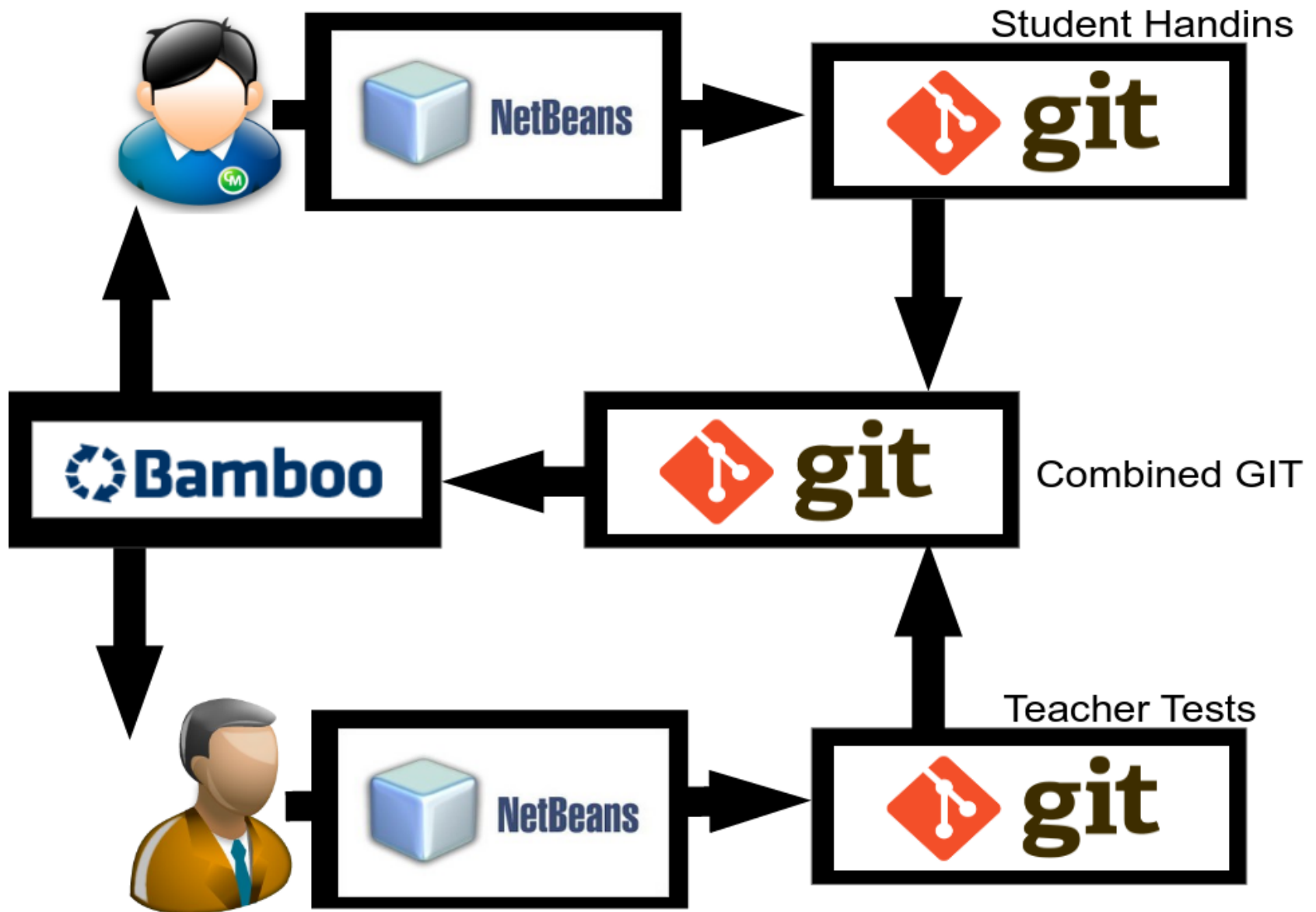
- Also from Atlassian
- Build / continuous integration server
- Projects consist of one or more plans (recipe)
- Fetches code from Stash then builds and tests it
- The plan defines how the code is built and tested
- Shows the result by parsing the test report (e.g. JUnit XML)



The screenshot shows the Bamboo Build Dashboard interface. At the top, there is a dark blue navigation bar with the Bamboo logo, "My Bamboo", and dropdown menus for "Build", "Deploy", and "Reports". Below the navigation bar, the main heading reads "Bamboo – Build Dashboard". The dashboard content is organized into a table with two columns: "Project" and "Plan".

Project	Plan
▼ DAT101-20142015	handins
▼ DAT219 2014 - Souls	Build

At the bottom right of the table, there is a "Sync" button.



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

andref13	❗ #73	21 minutes ago	15 of 30 failed
andret11	✅ #10	5 hours ago	14 passed
andrvs08	❗ #3	5 hours ago	14 of 14 failed

Add test results: Test case result

Description Add test results

Test class tests.test_hand-in_3_1.Hand_In_3_1_Case

Method test_add_test_results

```
-----  
error  
-----
```

```
Failed to find 'student id = 1, course name = Course 1
```

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