New Development, Build and Test Workflow Proposal

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In October, the CASA team will begin using the new Atlassian software suite. The suite includes a newer version of JIRA, the BitBucket revision control system (which uses git under the hood), the Bamboo continuous integration server, and the Confluence internal documentation server (similar to a wiki) and calendar system. Developer instructions on the details of using each of these systems will be provided before the transition, but we first need to decide on the overall development, build, and test workflow. To leverage the power of this suite of software some changes need to be made to our current workflows. This document, written for CASA developers, describes one proposed workflow developed through discussion with the build and test team members.

If you are unfamiliar with the distributed revision control paradigm used by git, you can review a draft of the git work instructions[1]. It will explain some of the terminology used here.

Changes while in the "Scheduled" state

Work assignment details will be captured in JIRA tickets, as is done now, and the actual development will be done while the JIRA ticket is in the "Scheduled" state. See Figure 1 for a graphic description of the workflow described here.
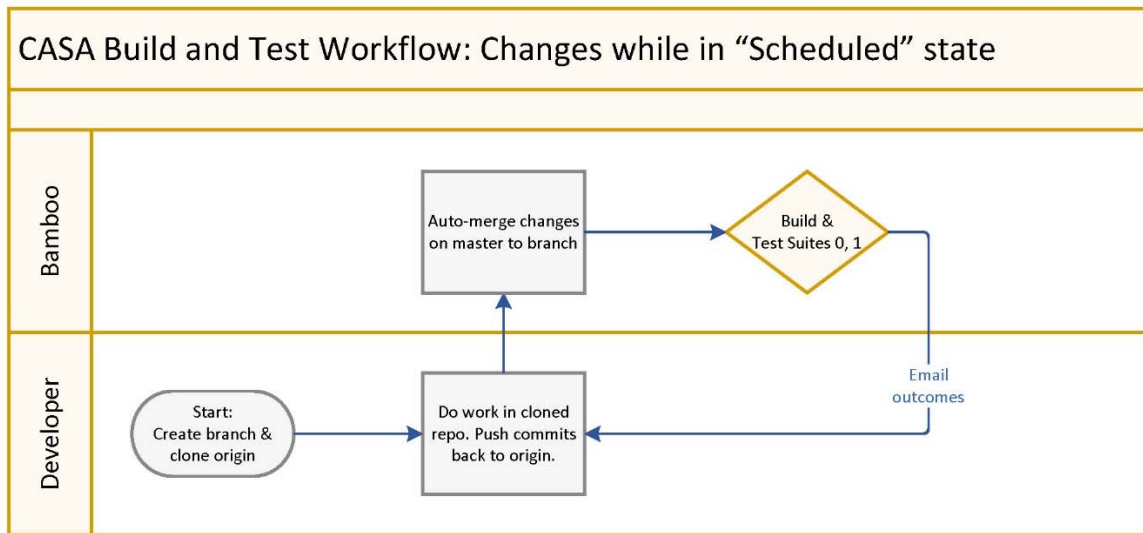
When the ticket enters the scheduled state, you will create a branch off of the master branch and clone the repository to your local machine. In the course of development, you should occasionally push your code changes back to the BitBucket server. (In git lingo, the repository on the BitBucket server is called "origin.") This push will trigger an automated merge of any changes on master to your branch. After the merge, Bamboo will build your branch and run automated test suite 0 ("package" and "smoke" tests) and test suite 1 ("verification" and "validation" tests); the build and test sequence will take 30 minutes to an hour if successful. The outcome of this merge, build, and test will be emailed to you by Bamboo.

If the merge, build, or test sequence fails, you should review the email from Bamboo and investigate to determine the source of the problem. The problem could be in your code changes, or it could be in code changes merged from the master branch. Notify the build team if you believe the problem exists in code changes on master.

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[1] https://casa.nrao.edu/plonedocs/stable/casa-processes/version-control-git

Figure 1

CASA Build and Test Workflow: Changes while in "Scheduled" state

While working on an issue a developer will commit code changes regularly and periodically push commits back to origin. Each push triggers an auto-merge of master to branch (only on origin; no automated changes are made on your local repository). Bamboo then builds the branch and runs Test Suite 0 (package and smoke tests) and Test Suite 1. The outcomes are emailed to developer and other appropriate staff.

After the "Scheduled" state

When finished with an assignment you should push the last of your code changes to origin and change the JIRA ticket status to "Ready to Verify." See Figure 2 for a graphic description of the workflow described here.

Changing the ticket status to "Ready to Verify" will signal Bamboo to perform an automated merge, build, and run test suites 0, 1, and 2; the build and test sequence will take several hours if successful, or less time if unsuccessful. The outcome of this build and test will be emailed to you by Bamboo.
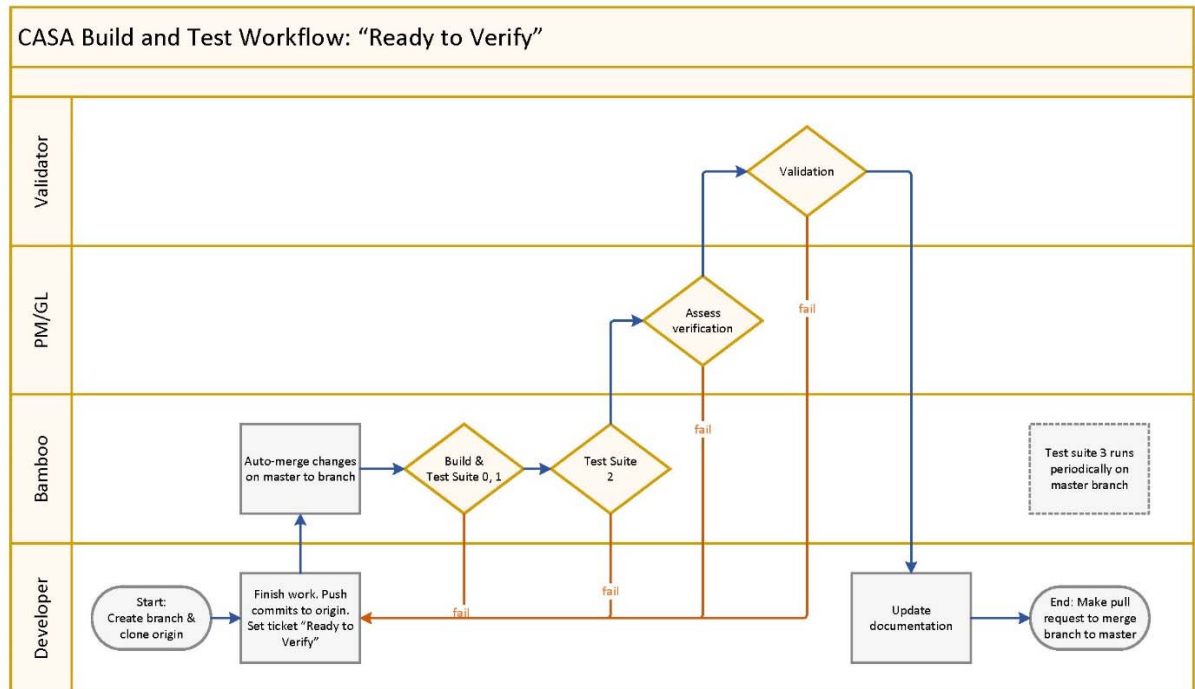
After passing the automated tests, the project manager (PM) or group lead (GL) will assess the verification status. This assessment will primarily consist of making sure the automated processes worked properly. Additional manual testing by the test team may be requested. If any problems are found the ticket will return to the "Scheduled" state and be reassigned to you.

When satisfied with the test results, the PM or GL will change the ticket status to "Ready for Validation." The ticket will then undergo the usual validation testing process by the User Test team. A failure in this stage will cause the ticket to return to Scheduled state and be reassigned to you.

If the ticket passes validation, the status is changed to "Resolved." Here you should update applicable user documentation. When finished, make a "pull request" to inform the build team that your branch is ready to be merged to the master branch. The should be assigned to the appropriate build engineer.

The final part of the test process is automated test suite 3 (long running validation and regression tests), which runs periodically on the master branch. These tests may take up to 24 hours to complete and are not directly connected to the branch lifecycle.

Figure 2

CASA Build and Test Workflow: "Ready to Verify"

- When developer believes work is finished, all code changes are committed and pushed back to origin. Ticket is marked 'Ready to Verify' which triggers an auto-merge of master to branch, followed by build and automated test suites 0, 1, and 2. The PM/GL will assess automated testing and may request additional manual verification from test team. If all verification tests pass, ticket is set "Ready to Validate".
- All Bamboo processes send email notification to appropriate staff.
- PM = project manager, GL = group lead.