sdmay18-09: Tool Support for Continuous Model-Based Verification of the Linux Kernel
Weekly Report 3
February 9 – February 23, 2018
Client: Suraj Kothari
Faculty Advisor: Suraj Kothari

Team Members:
Srinivas Dhanwada – Team Lead
Collin McIntyre – Tool Integration Lead
Benjamin Weno – Automation Lead
Matthew Wall – Web Lead

Summary of Progress this Report

This reporting period was spent mostly on bugfixing and maintenance of our programs due to most of our members having a heavy workload outside of this project. This limited our activity for this period. Some of our members were having trouble accessing our Git repository remotely due to several large files in the repository. These files are previous versions of the old website and while they brought clarity to the project initially, they're not particularly useful anymore. We have removed these files from our repository and moved them to a shared drive instead, and each of our members can accesses our Git repository without trouble. We've also set up a runner pipeline on our Git Repository that allows us to utilize GitLab CI for testing. We encountered some issues with our patch generation algorithm where not all locking functions and macros were being identified for spinlocks. We've identified that we need to broaden the criteria we're using for function and macro selection, but are still working on exactly what the criteria needs to be set to. We've also updated our automation scripts to become capable of downloading the newest version of a kernel upon its release, but need to test it in a Linux environment to ensure compatibility with the rest of the system. We also identified some issues with our current website implementation, specifically with two-way data binding. These issues have been found and fixed. We've also worked with our client's PhD research assistant to set up our own workspace in the lab and learned how to manually run L-SAP.

Pending Issues

- Criteria for the patch generation algorithm needs to be refined.
- Locations of macro redefinitions in the kernel need to be identified.
- We need access to the lab to perform our tests (this is nearly resolved).
- Need to contact ETG about getting a shared runner set up for the GitLab CI testing framework.

Plans for Upcoming Reporting Period

In the next reporting period, we plan to identify the criteria needed to select all applicable functions and macros for the patch generation algorithm as well as identify the locations of macro redefinitions so the patch can be applied correctly. We plan to contact ETG about getting a shared runner set up for the GitLab CI testing framework. We plan to utilize our access to the lab to begin testing our automation scripts. Lastly, we also plan to continue setting up our website to accept results from L-SAP.

Individual Contributions

Team Member	Contribution	Hours This Period	Total Hours
Srinivas Dhanwada	• Modified the Git repository to remove the old versions of the website. • Set up and fixed the GitLab CI pipeline.	6	104
Collin McIntyre	• Worked on expanding/identifying proper criteria for macro and function selection. • Worked with client's PhD research assistant to set up our workspace in the lab and learned how to run L-SAP manually.	6	83.5
Benjamin Weno	• Modified automation scripts to automatically download the newest version of the kernel on its release (needs testing) • Worked with client's PhD research assistant to set up our workspace in the lab and learned how to run L-SAP manually.	4	54
Matthew Wall	• Identified bugs in current website implementation related to two-way data binding. • Continued working on website implementation to prepare it for accepting data from kernel verifier.	4	53.5