

sdmay18-09: Tool Support for Continuous Model-Based Verification of the Linux Kernel

Week 8 Report

November 1 - November 8

Team Members

Srinivas Dhanwada — *Team Lead*

Collin McIntyre — *Tool Integration Lead, Scribe*

Benjamin Weno — *Automation Lead*

Matthew Wall — *Web Lead*

Summary of Progress this Report

We've continued working on our locking instance mapping algorithm and have fixed some of the bugs related to extensive changes before a lock instance, but still have a couple of bugs left to fix. We've discussed the results of looking through different versions of the kernel at specific locking instances and have begun to form an approach for the Difference Mapping algorithm, although it is still very much a work-in-progress at this point. We've made some progress in the development of a patch for version 4.13.7 of the kernel, and moving the kernel from a remote server to a local machine did drastically help compile times, which are now down to about an hour or so. We've also begun working on some of the finer details of implementation of our website.

Pending Issues

While we don't necessarily have any major roadblocks, our issues at this point are related to the continuous discovery of various bugs, both in our locking instance mapping algorithm and kernel patch development. They aren't issues we aren't able to resolve, but they keep appearing, which leads us to believe that our original implementation for both of these algorithms didn't consider enough factors. We've continued to handle the bugs as they come up, and the bugs are becoming less common. We hope to finish development of the patch and instance mapping algorithm in the near future.

Plans for Upcoming Reporting Period

We plan to finish fixing the bugs in our locking instance mapping algorithm and finish development of our patch for version 4.13.7 of the kernel that will allow the verification algorithm to run. We also plan to continue to implement our Difference Mapping algorithm and hammer out the details, and would like to begin working on a program to automate the process, but this may need to wait another week or two.

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Srinivas Dhanwada	Srinu has continued to patch out the bugs in the locking instance mapping algorithm and has narrowed the list of bugs in the algorithm to just a couple. He has also worked with Collin and Ben to begin creating the Difference Mapping algorithm using the results of his investigation of different versions of the Linux kernel. The algorithm is	10	67

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