

EE/CprE/SE 491 WEEKLY REPORT 7

Start Date – End Date: 03/19/2024 - 03/26/2024

Group number: 9

Project title: Multicore Operational Analysis Tooling

Client &/Advisor: Steve Vanderleest/Joe Zambreno

Team Members/Role: Alexander Bashara – Embedded Engineer, Joseph Dicklin – Hardware Design Engineer, Hankel Haldin – OS/Tooling Engineer, Anthony Manschula – Project Coordinator/Engineer

Weekly Summary: During this report period, we focused on researching additional resource contention points in detail for our hardware platform, as well as potential avenues that would allow us to mitigate the performance effects seen because of the contention. Additionally, we discovered that our Linux image we created is not functioning completely correctly, so some additional research is necessary to figure out what is going on.

Past week accomplishments: We continued our work in trying to get the Xen environment working on the Pine64 board. Ultimately, we developed several different plans to get Xen installed and working on the Pine64 board, so we have more data on what does not work. We also presented more of our research on interference channels to Boeing.

Pending issues:

- Debug issues running Xen toolstack on our image
- Refine Yocto build script for Xen
- Develop base test cases for both CPU and memory bandwidth interference
- Begin testing Xen hypervisor on x86 while finishing bringing up on our ARM hardware
- More research on resource contention points and mitigation methods

Individual contributions:

<u>NAME</u>	<u>Individual Contributions</u>	<u>Hours this week</u>	<u>HOURS cumulative</u>
Alexander Bashara	Cache Interference generation and mitigation	6	44
Joseph Dicklin	Researched I/O interference generation	5	41
Hankel Haldin	X86 Xen Hypervisor install / configure, multicore interference channel research	8	46
Anthony Manschula	Building and booting Xen on hardware, additional research	4	48

Plans for the upcoming week:

- Work on fixing issues with Xen framework on our Linux image
- Develop base test cases as mentioned above
- Test Xen on x86
- Continue research on interference channels
- Expand on interference mitigation techniques

Summary of weekly advisor meeting: On 3/8, the team met with Boeing to discuss our progress, and the success that we had with building and booting a Linux image for our hardware using Yocto. We also got some suggestions for how to debug our Xen image, so we will be pursuing those.