## **Research Progress Report**

**Topic: seL4 Emulation on Linux** 

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## Summary of this week

For week4, I focused on the following tasks:

• Understanding how does Cygwin1.dll act as an emulation layer and provide substantial POSIX system interface. The way it works is it recompiles the program source code under the Cygwin and the result will be a Windows program that calls Cygwin Library.

The drawbacks will be:

- 1. We have to obtain the source code of the program we want to run.
- 2. If the program calls syscall or int 0x80 instruction directly this approach won't work.
- 3. It's impossible to convert Linux application semantics to Windows semantics sometimes.
- Looked into the implementation of syscalls library in seL4
- Learning some basic assembly language of X86\_64 architecture.
- (This week got distracted by interviews and other assignments, I made less progress.:()

## Plan for next week

For the next coming week, I will focus on the following tasks (the order is from the most important to the least important task):

- 1. Build a simple helloworld application, which can run on top of seL4 and print "Hello World", recompile AOS SOS project with X86\_64 architecture. If this is successful, try to monitor some more complicated applications with different syscalls.
- 2. Draft the thesis statements of this term. (Should be finished by this weekend)
- 3. Continue studying the ptrace() syscall of Linux and also try to think how to build a custom ELF loader which can run seL4 binary so that we can use ptrace() to attach to it and then monitor tracee applications' behaviours.

## **Time Table**

(This will be my ideal timetable, the real progress will be assessed in the next week's report).

Day	Task
Sat	Thesis statement + seL4 syscall library review
Sun	Continue Sat task
Mon	Continue Sat task + build helloworld app + All Hands Meeting
Tue	Continue Mon task
Wed	
Thu	Writing the progress Report + Weekly Sync Meetings with Axel
Fri	System meeting + Progress Report