

18-648: Recitation 1

Lab Overview

Overview of the labs

- 0) Development environment setup
- 1) Loadable Kernel modules + Device Drivers Introduction
- 2) Task execution budgeting framework
- 3) Budget enforcement framework
- 4) Energy Management

And More...

Lab Policies

- 1) 10% penalty per late day.
- 2) Class git server will be closed at lab deadline (midnight). Late submissions? Get in touch with the TAs.
- 3) **Platform: Nexus 7 2012.** Each team will receive one tablet, a USB cable and a charger. **Needs to be returned at the end of the semester.**
- 4) No extra days in case your tablet is lost or damaged. Replacing tablets will take time! Please treat your tablets well :)
- 5) Collaboration across teams is not encouraged.

Environment Setup Walkthrough

- 1) Lab 0 has been posted on Piazza under Resources
- 2) OS Setup
- 3) User Setup
 - a) Each student submits a public SSH key to the server
 - b) Only **one** team member creates the repos and gives the other team members access
- 4) Get the Kernel
- 5) Android SDK
- 6) Java Environment for Android Development
- 7) Kernel / User space compilers
- 8) BusyBox
- 9) Compile and Boot the kernel

Linux Kernel Fundamentals

- You will create a directory called `rtes` at the topmost level of your kernel
 - `rtes` will contain the following directories
 - `kernel` - source code for built-in kernel code
 - `modules` - source code for loadable kernel modules
 - `apps` - source code for userspace applications
 - ***MOST*** of your work will happen in this directory
 - You will have to tweak other files in the kernel

Linux Kernel Fundamentals: Compilation

- Kernel Space Compilation
 - Kernel compiler
 - Covers built-in kernel code
 - Covers Loadable Kernel Modules (LKMs)
 - Can be loaded and unloaded
 - Requires that generated .ko be sent to the target
- User Space Compilation
 - Userspace compiler
 - Covers user space code
 - Requires that generated binary be sent to the target
 - You must generate these binaries yourself

Linux Kernel Fundamentals: Compilation

- Kernel Space Compilation
 - Top-level kernel Makefile
 - Kbuild files
 - Makefiles
- User Space Compilation
 - Makefiles

Hardware Time!