Kernel Development Learning Pipeline (KDLP)

February 5, 2023
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Agenda

➢ What is KDLP
➢ Why are we doing this
➢ Program Overview
  ○ Intro to Kernel Development Course
  ○ Kernel Engineering Internship
  ○ Red Hat “new kernel devs” Group
➢ Program Growth
  ○ Program Integration
  ○ Linux Foundation Mentorship
  ○ Program Success Stats
➢ Resources
What is KDLP

- Kernel Development Learning Pipeline
- Comprehensive pipeline for Linux kernel talent
  - And low-level dev talent more generally
- Current Components:
  - Introductory course
  - Intern/mentor matching
  - Intern TAs for the course
  - Red Hat intern recruitment
  - Red Hat associate recruitment
Why KDLP

- Many senior Linux kernel engineers are getting close to retirement
- Kernel onboarding takes awhile
- Current shortage of qualified entry-level kernel candidates
  - Kernel is not taught at most colleges
  - Neither are the relevant tools!
- Hard to find talent? Grow new talent!
- More value for Red Hat at a lower cost
- Train the next generation of developers from all backgrounds
Program Overview
Program Overview

**Kernel development course**
Intro to Kernel Development class with labs on Raspberry Pis and in class coding activities.

**Kernel engineering internship**
Interns will use skills learned in the class to work on kernel engineering projects and assist in the currently running course.

**Full time kernel engineer**
Work on the Red Hat Enterprise Linux kernel engineering team and help with KDLP program.
Intro to Kernel Development Course

- Introduce students to Linux kernel development
- Pre-requisites: C language skills and basic Linux experience
- Students learn:
  - Overview of core features and components of the kernel
  - Basic device driver development
  - Usage of tooling such as git, bpftrace, and cscope
- Open source course materials and assignments
- An undergrad and graduate level university course
- A mentorship program on LFX
- We teach difficult material from first principles
Kernel Engineering Internship

- Interns will build on course knowledge
  - Working on a kernel related project
  - Example: ACPI support for the Raspberry Pi Sense Hat driver
- Interns have the option to help us with our program
- Mentored by an experienced RHEL kernel engineer
  - Support key initiatives within Red Hat while training new talent
Red Hat “new kernel devs” Group

- Group of kernel engineers of various skill levels within Red Hat
  - Associates, interns, and managers are all invited
  - Focus is on engineers new to the kernel

- Purpose of group
  - Discuss kernel concepts
  - Share helpful tools
  - Ask kernel questions
  - Space to socialize and get to know other kernel devs

- Recurring monthly meeting
  - Occasional presentations on a variety of kernel topics
Program Growth
Program Integration

- Partnered with Red Hat’s primary internal educational initiative
  - Red Hat Academy
- 2022 Workshop for Waterford, Ireland interns
- New connections to educational programs in various countries
- The Linux Foundation
Linux Foundation Mentorship

- KDLP partnered with The Linux Foundation
- [LFX Mentorship platform](#)
- Supported by Shuah Khan
- UML and LFX cohorts for same course
- Graduated mentees listed on LFX website
- Very diverse group of mentees
Program Success Stats

- Two (2) full time hires during a hiring freeze
  - Two (2) co-ops recruited to Amazon and Microsoft
  - One of them wants to come back :)
- Seven (7) interns and co-ops trained, vetted, and recruited
  - Via KDLP
- Twelve (12) students completed Intro to Kernel Development in Fall 2022
- About a dozen students and mentees each in the UML and LFX sections in Spring 2023
  - Most diverse group ever by gender and location
Program Information
Meet the Team

- Joel Savitz <jsavitz@redhat.com> - Program Lead
- Julia Denham <jdenham@redhat.com> - Program Manager
- Charles Mirabile <cmirabil@redhat.com> - Course Content Lead
- Denis Aleksandrov <daleksan@redhat.com> - Intern & Class TA
Acknowledgements

Big thank you to the following Red Hatters:

- Heidi Dempsey, Research and Innovation Director, North America
- Mike McGrath, Vice President, RHEL
Resources

Communication

➢ Mailing list: rh-kdlp@googlegroups.com (join)
   ➢ Quarterly update newsletter
➢ Program office hours weekly on Tuesdays at noon EST
➢ Or just send me an email!

Information

➢ Our Website
➢ Spring 2023 Course Info
➢ UMass Lowell catalog page
➢ LFX mentorship page

Mentorship Crowdfunding

➢ Support program development
➢ Support diverse engineers
Questions?
Thank You!

KDLP website: kdlp.underground.software
Joel’s website: joelsavitz.com