

Kernel Development Learning Pipeline (KDLP)

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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

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- ▶ 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