Introduction

KDLP – Kernel Development Learning Pipeline

MUNI Fall 2024

Rado Vrbovsky, Carlos Maiolino

Vratislav Bendel, Izabela Bakollari

linkedin.com/company/red-hat

facebook.com/redhatinc

youtube.com/user/RedHatVideos

twitter.com/RedHat

Red Hat

Overview

- Wellcome
- Course information
- KDLP
- Who are we
- The course
- Grades and expectations
- Assignments
- Suggested Literature

Red Hat

Course Information

- Lecture time: Mondays 14pm–16pm CET
  - Except 28th of October – Public holidays
- Place: FI MUNI, Building S, Room S505
- Language: English
- Pre requisites
  - C language knowledge
  - Basic knowledge about operating systems in general
  - Practical skills in Linux operating system (e.g. Fedora, Debian, Slackware)
  - Basic git
  - Own computer, preferably a laptop with x86 architecture
- Credits: The reward for passing the course is 3 credits.

Why is KDLP?

- Challenges in getting started with Linux kernel development without guidance
- The documentation gap and overwhelming terminology
- Navigating the kernel community and its strict rules
- Bridging the gap between academic learning and industry needs

What is KDLP exactly?

- Kernel Development Learning Pipeline
  - https://kdlp.underground.software/course/index.html
- The Kernel Development Learning Pipeline (KDLP) program aims to create a comprehensive Linux kernel talent pipeline to address the current shortage of qualified entry level kernel candidates.
- Created and developed in 2021 by Julia Denham, Joel Savitz and Charlie Mirabile at UMass Lowell in Boston
- Incremental Improvements based on student feedback (US course)
- Expansion to Israel in 2024 (Technion in Haifa)
- Expansion to Czech Republic in Fall 2024 (Course redesign for MUNI specifics) by Rado Vrbovsky, Izabela Bakolari, Carlos Maiolino, Vratislav Bendel and Leonardo Vaz

Red Hat

Rado Vrbovsky

- Kernel Maintainer for Red Hat since 2012
- Currently maintaining CentOS 9 and RHEL-9 kernels
- Project leader on the MUNI KDLP project
    - Turn your questions regarding organization to me
- Previously BIOS developer
- Geek, artist, manga reader

- Contact: rvrbovsk@redhat.com

Carlos Maiolino

- Red Hatter since 2008
- Filesystems engineer
- Upstream XFS maintainer
- Tech scuba diver and wall climber
- Contacts:
  - cmaiolino@redhat.com
  - cem@kernel.org
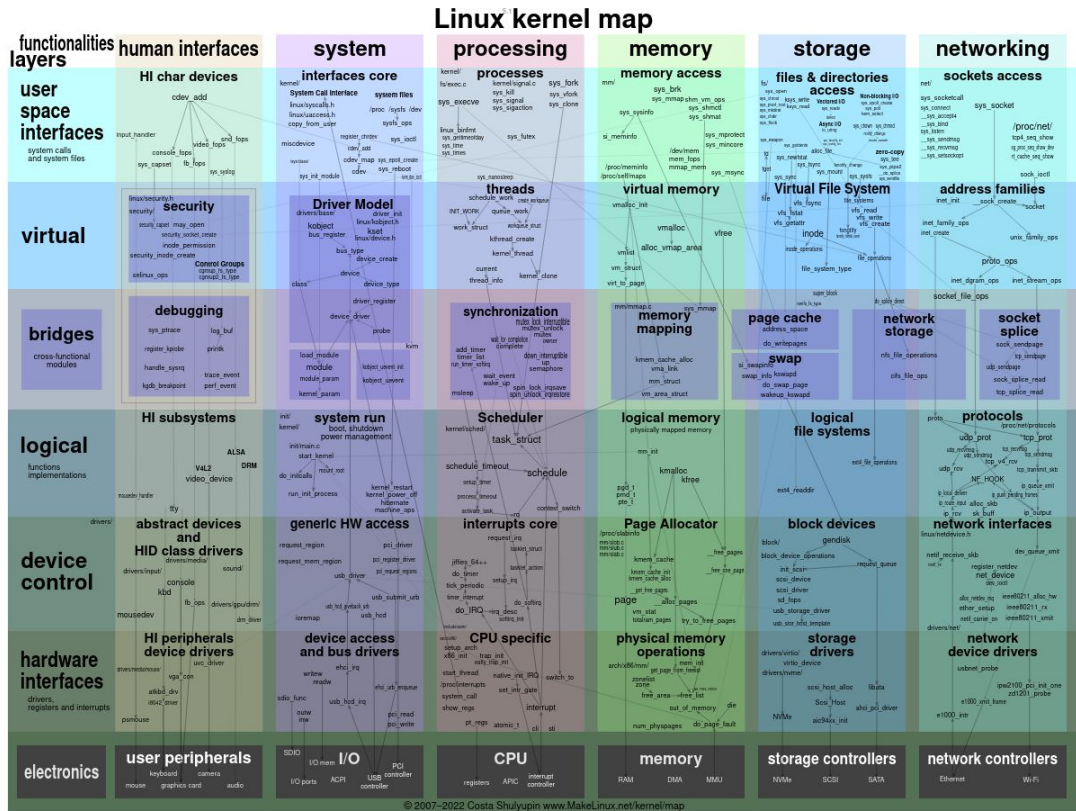 - cem AT irc.oftc.net (yes, IRC still lives)

Vratislav Bendel

- Started as intern in Red Hat 2016
- Software Maintenance Engineer for RHEL kernel
- Focus on performance analysis & tuning

- Gamer at heart (video, board, card, .. :)

- vbendel@redhat.com   (personal on demand ;)

Red Hat

The course – Linux Kernel is huge

Linux kernel map

Grades and Expectations

- There will be assignments (aka homework)
- Each assignment has a deadline when it must be delivered
- Each assignment is assigned a specific number of points based on its difficulty or importance
- These points add up to a maximum of 100
- To pass the course, students need to accumulate at least 65 points across all assignments

Red Hat

Assignments - Where, How?

- Assignments will be published over the course of time on the KDLP web page
  - https://fall2024-muni.kdlp.underground.software/index.html
- Each assignment will tell you what is exactly expected and what to deliver
- There is a private mailing list (you will not receive a copy of other students email)
  - kdlp-brno-assignments@redhat.com
- "Public" mailing list
  - kdlp-brno@redhat.com

Red Hat

Dos and Don'ts

- Be creative!
- ASK!
- Meetings among students to work together are fine
- Exchanging ideas is fine
- Sharing code is NOT fine
- ChatGPT and alike are a powerful tool, please consider what you will learn if you will rely on them

Red Hat

Suggested literature

- Linux Kernel Development – Robert Love
- Linux Device Drivers – Jonathan Corbet, Alessandro Rubini, and Greg Kroah–Hartman
- The design of the Unix operating system – Maurice Bach
- Linux Kernel Networking – Implementation and Theory – Rami Rosen
- LWN.net – https://static.lwn.net/kerneldoc/index.html
- Unix Source Code – https://github.com/lsahn-gh/unix-v6/tree/master/sys

Red Hat

Thank you!

Questions?

Red Hat