Introduction

KDLP – Kernel Development Learning Pipeline

MUNI Fall 2025

Rado Vrbovsky, Carlos Maiolino
Vratislav Bendel, Michal Schmidt

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Course Information

- Lecture time: Mondays 14pm-16pm CET
    - Except 17th of November - 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.

Rado Vrbovsky

- Previously BIOS developer
- Kernel Engineer for Red Hat since 2012
- Used to maintain CentOS and RHEL kernels
- Working on the kernel live patching
- Project leader on the MUNI KDLP project
    - ○ Turn your questions regarding organization to me
- Geek, artist, manga reader
- Contact: rvrbovsk@redhat.com

Who are we

Carlos Maiolino

- Red Hatter since 2008
- Filesystems engineer
- Upstream XFS maintainer
- Contacts:
  - cmaiolino@redhat.com
  - cem@kernel.org
  - cem@toxiclabs.cc
  - 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 ;)

Who are we

Michal Schmidt

- At Red Hat since 2006
- Network Drivers team lead
- Past: real-time kernel, Fedora package maintainer (systemd, ...), team manager
- singer, guitar player
- mschmidt@redhat.com

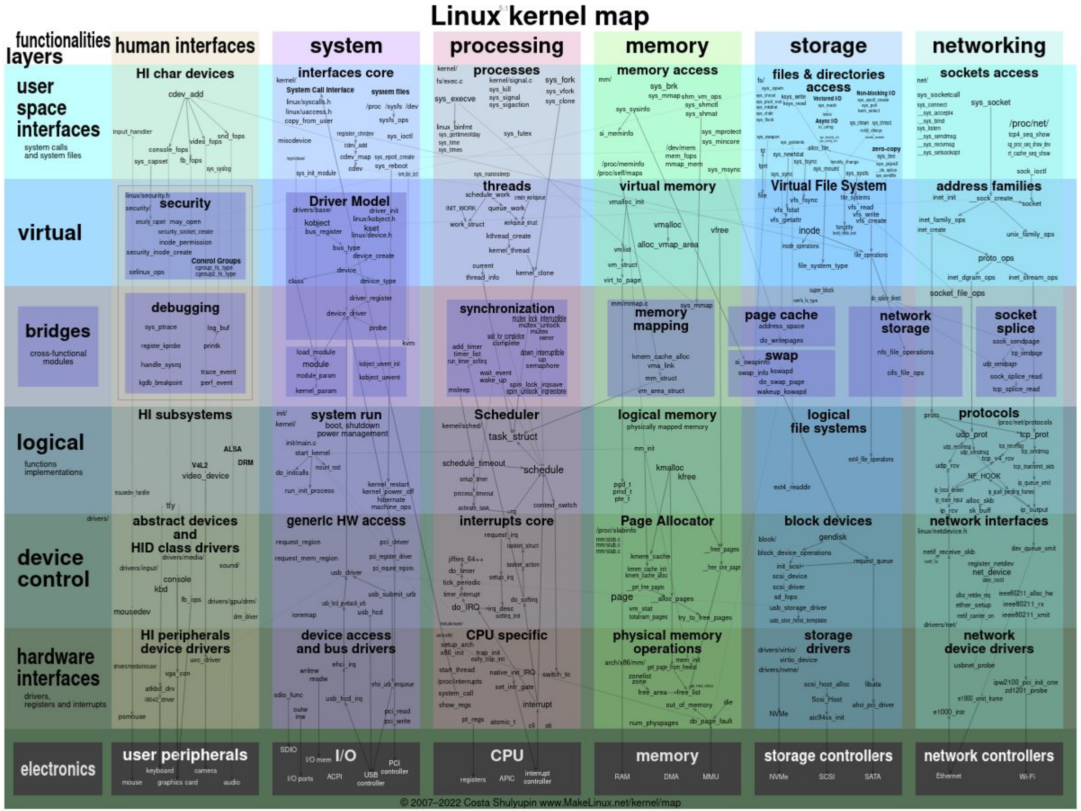
Why is KDLP?

- 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, Carlos Maiolino, Vratislav Bendel and Leonardo Vaz

The course – Linux Kernel is huge



Source - https://makelinux.github.io/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 assignments

Assignments - Where, How?

- Assignments will be published over the course of time on the KDLP web page
    - https://fall2025-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

What to Expect

Feedback from last semester

- I enjoyed that I actually learned something and got hands on the "real thing" (satisfying :DD)
- The difficulty was really over the top i think... for a subject that is only 3 credits it was too time consuming
- The actual assignments were fun and cool and I learned a lot from them. Maybe because it was so hard for me.
- Raise the credits for the course :), I guess I just spent more time on the course than I would expect, but the difficulty isn't necessarily a bad thing.
- In the end one of the most informative courses I had at FI.

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

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

Thank you!

Questions?