Szkolenie: The Linux Foundation
LFD445 Linux Kernel Debugging

Cel szkolenia:

Gaining expertise in Linux kernel debugging will position you as a more versatile, knowledgeable and valuable asset to any organization while opening new career doors and helping you participate more actively in the open source community.

What You'll Learn

- You will learn techniques for local debugging by configuring a system (physical or virtual) for remote debugging from a second system and working with the basic components of the Linux kernel that underlie the built-in debugging frameworks.

Who Is It For

- This course is designed for current or aspiring kernel developers, device driver developers, and anyone interested in shortening the development cycle by taking advantage of existing tools and facilities.

Plan szkolenia:

- Introduction
  - Objectives
  - Who You Are
  - The Linux Foundation
  - Linux Foundation Training
  - Certification Programs and Digital Badging
  - Linux Distributions
  - Platforms
  - Preparing Your System
  - Using and Downloading a Virtual Machine
  - Things change in Linux

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- Documentation and Links
- Preliminaries
  - Procedures
  - Kernel Versions
  - Kernel Sources and Use of git
- How to Work in OSS Projects **
  - Overview on How to Contribute Properly
  - Stay Close to Mainline for Security and Quality
  - Study and Understand the Project DNA
  - Figure Out What Itch You Want to Scratch
  - Identify Maintainers and Their Work Flows and Methods
  - Get Early Input and Work in the Open
  - Contribute Incremental Bits, Not Large Code Dumps
  - Leave Your Ego at the Door: Don’t Be Thin-Skinned
  - Be Patient, Develop Long Term Relationships, Be Helpful
- Kernel Features
  - Components of the Kernel
  - User-Space vs. Kernel-Space
  - What are System Calls?
  - Available System Calls
  - Scheduling Algorithms and Task Structures
  - Process Context
  - Labs
- Kernel Deprecated Interfaces
- Printk
- Monitoring and Debugging
  - Debuginfo Packages
  - Tracing and Profiling
  - sysctl
  - SysRq Key
  - oops Messages
  - Kernel Debuggers
  - debugfs
  - Labs
- Ftrace
  - What is ftrace?

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- ftrace, trace-cmd and kernelshark
- Available Tracers
- Using ftrace
- Files in the Tracing Directory
- Tracing Options
- Printing with trace printk()
- Trace Markers
- Dumping the Buffer
- trace-cmd
- Labs

- Kernel and git Bisection
- Kernel Development Tools
- Perf
  - What is perf?
  - perf stat
  - perf list
  - perf record
  - perf report
  - perf annotate
  - perf top
  - Labs
- kprobes
  - kprobes
  - kretprobes
  - SystemTap **
  - Labs
- eBPF
  - BPF
  - eBPF
  - Installation
  - bcc Tools
  - bpftrace
  - Labs
- QEMU
  - What is QEMU?
  - Emulated Architectures

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        - Image Formats
        - Third Party Hypervisor Integration
        - Labs
    - gdb Kernel Scripts
    - Linux Kernel Debugging Tools
        - Linux Kernel (built-in) tools and helpers
        - kdb
        - qemu+gdb
        - kgdb: hardware+serial+gdb
        - Labs
    - Crash
        - Crash
        - Main Commands
        - Labs
    - kexec
        - kexec
        - Kernel Configuration
        - kexec-tools
        - Using kexec
        - Labs

Wymagania:

To make the most of this course, you should:

- Be proficient in the C programming language.
- Be familiar with basic Linux (UNIX) utilities such as ls, grep and tar.
- Be comfortable using any of the available text editors (e.g. emacs, vi, etc.).
- Experience with any major Linux distribution is helpful but not strictly required.
- Have experience equivalent to having taken Linux Kernel Internals and Development (LFD420).

Poziom trudności



Certyfikaty:

The participants will obtain certificates signed by The Linux Foundation.

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Prowadzący:

The Linux Foundation Certified Trainer

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