

Course Outline



Other Information	
RHD236	
Days	5
Starting Time	9:00
Finish Time	4:30
Lunch & refreshments are included with this course.	

Red Hat Linux Kernel Internals

Introduction

RHD236 Red Hat Linux Kernel Internals is an intensive hands-on course designed to provide a detailed examination of the Linux kernel architecture, including process scheduling, memory management, filesystems, and driving peripheral devices. RHD236 is taught in a classroom with computers equipped with the current Linux distribution. This 5-day course provides hands-on training, concepts, and demonstrations, with emphasis on realistic labs and programming exercises.

Goal

Upon completing the class, students should feel comfortable modifying the Linux kernel to fit the needs of their hardware or applications, and developing device drivers. They will also have the tools necessary to port existing applications and device drivers to Linux, primarily from Unix-like systems.

Audience

This class is intended for experienced developers who want to gain a thorough understanding of the Linux architecture, including the newest kernels.

Prerequisites

Completion of RHD221 (Linux Device Drivers) or equivalent experience, including:

- Familiarity with basic tools such as vi, emacs, and file utilities.
- Knowledge of systems programming in a Unix or Linux environment is a requirement; register-level hardware programming knowledge is recommended.
- Understanding of basic Operating System concepts.
- Some previous experience running Linux, compiling and installing kernels, etc.
- Experience writing device drivers and kernel modules are not essential, but very helpful.

Course Objectives

- Kernel Architecture
- Kernel Layout and Configuration
- Kernel Style and General Considerations
- Modules
- Synchronization Methods
- Kernel Initialization
- Timing Measurements
- Dynamic Kernel Timers

- Wait Queues
- Work Queues
- Tasklets
- Debugging Techniques
- The /proc Filesystem
- The seq_file Interface
- Processes
- Process Limits and Capabilities
- Process Scheduling
- Interrupts and Exceptions
- System Calls
- Signals
- Device Drivers
- User <-> Kernel Space
- Character Drivers
- Memory Addressing
- Memory Management
- Process Address Space
- Disk Caches
- Swapping
- Memory Mapping
- Multiplexed and Asynchronous I/O
- Networking internals
- In Kernel Web Server Acceleration