RHD251 Red Hat Linux Programming

Course Summary

Description

This intensive course rapidly trains programmers to develop applications and programs on Red Hat Enterprise Linux. Over the span of five days, you'll get hands-on training, concepts, and demonstrations with emphasis on realistic labs and programming exercises. Learn concepts and skills essential to programming and software development for Linux-based applications and products.

Topics

- GCC - GNU Compiler Collection
- Building Software with Make
- The GNU C Library and System Calls
- Program Arguments and Environment
- Building Libraries
- Time Functions
- Process Management
- Memory Operations
- Debugging
- Basic File Operations
- Communicating with Pipes
- Managing Signals
- Programming with Threads
- Advanced File Operations
- Interprocess Communication (IPC)
- Basic Network Programming
- Working with the Linux Community

Audience

This course is designed for experienced C programmers who want to learn key skills for creating applications and programs on Red Hat Enterprise Linux. This course is also useful for Windows and UNIX programmers migrating their programs to Linux.

Prerequisites

- Experience in C programming
- RH133 or equivalent UNIX or Linux workstation user skills for developers
- Shell scripting in a UNIX or Linux environment
- Experience with editors such as vi, emacs

Duration

Five days

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Course Outline

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Course Outline (cont'd)

D. Getting Started with gdb
E. Examining and Changing Memory
F. Debuginfo Libraries
G. Using gdb with a Running Process
H. Using gdb to Autopsy a Crash
I. Debugging Libraries - ElectricFence
J. Debugging with valgrind
K. Profiling for Performance

IX. Basic File Operations
A. Stream vs. System Calls
B. Opening/Closing Streams
C. Stream Input/Output Functions
D. Stream Status/Errors
E. Stream File Positioning
F. Stream Buffering
G. Temporary/Scratch Files
H. Opening/Closing File Descriptors
I. File Descriptor I/O
J. Repositioning File Descriptors
K. Stream/File Descriptor Conversions
L. cat using ANSI I/O
M. cat using POSIX I/O

X. Communicating with Pipes
A. Introduction to Pipes
B. Standard I/O: popen()/pclose()
C. Using popen()/pclose()
D. System Call: pipe()
E. Using pipe()
F. Named Pipes
G. Using Named Pipes
H. For Further Reading

XI. Managing Signals
A. What Signals Are
B. Blocking/Checking Signals
C. Working with Signal Sets
D. Example of Blocking Signals
E. Handling Signals with sigaction()
F. sigaction() Example
G. Handling Signals with signal()
H. Sending Signals
I. Real-Time Signals

XII. Programming with Threads
A. Introducing Threaded Programming
B. Applications Suited to Threads
C. Building Threaded Programs
D. Creating Threads
E. Thread Identity
F. Synchronizing by Joining
G. Detaching Threads
H. Stopping Threads
I. Synchronizing with Mutexes
J. Using Mutexes
K. Read/Write Locks
L. Conditional Variables
M. Using Conditional Variables
N. A Conditional Variable Gotcha
O. For Further Reading

XIII. Advanced File Operations
A. Directory Operations
B. File System Operations
C. Multiplexed I/O with select()
D. Miscellaneous I/O Functions
E. Memory Mapped I/O
F. Using Memory Mapped I/O
G. File Locking

XIV. Interprocess Communication (IPC)
A. Interprocess Communication (IPC)
B. POSIX IPC Overview
C. POSIX Shared Memory
D. POSIX Semaphores
E. POSIX Message Queues
F. System V IPC Overview
G. System V IPC Shared Memory
H. System V IPC Semaphore Arrays
I. System V IPC Message Queues

XV. Basic Network Programming
A. Linux Networking Overview
B. Getting Started with socket()
C. Client Functions
D. Specifying IPv4 Addresses
E. Host Versus Network Byte Order
F. Example TCP/IP Client
G. Address Conversion Functions
H. Using getaddrinfo()

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Course Outline (cont'd)

- I. Server Functions
- J. Example TCP/IP Server
- K. Datagram Communication with UDP

XVI. Working with the Linux Community

- A. Getting in Touch with the Community
- B. General Considerations
- C. Building a Community
- D. Licenses
- E. GPL
- F. LGPL
- G. BSD
- H. Creative Commons