

Linux

C Programming

From Fundamentals to Advanced System Programming

A COMPREHENSIVE GUIDE TO BUILDING
ROBUST SOFTWARE ON THE LINUX PLATFORM



SYSTEM CALLS
AND PROCESSES



THREADS AND
SYNCHRONIZATION



NETWORKING
AND IPC



INTERPROCESS
COMMUNICATION



MODERN I/O APIs
(io_uring, epoll,
eventfd, signalfd)



FUTEXES AND
LOW-LEVEL PRIMITIVES



```
#include <stdio.h>
#include <unistd.h>
#include <sys/types.h>
#include <sys/wait.h>

int main() {
    pid_t pid = fork();
    if (pid < 0) {
        perror("fork");
        return 1;
    } else if (pid == 0) {
        execlp("/bin/ls", "ls",
            (char *) NULL);
        perror("execlp");
        _exit(1);
    } else {
        int status;
        waitpid(pid, &status, 0);
        printf("Child exited
            with status %d\n",
            WEXITSTATUS(status));
    }
    return 0;
}
```

IVAN GEBHART

Linux C Programming: From Fundamentals to Advanced System Programming (2026)

A Comprehensive Guide to Building Robust Software on the Linux Platform

Steve T. Publications

This book is available at <https://leanpub.com/linuxcprogrammingfromfundamentalstoadvancedsystemprogramming>

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A Comprehensive Guide to Building Robust Software on the Linux Platform

About this book: Linux C programming sits at the intersection of language mastery and systems understanding. This book takes you from the fundamentals of writing and compiling C code on Linux through the advanced territory of threads, synchronization, networking, interprocess communication, and modern I/O APIs like `io_uring`. Every chapter is built around real, compilable programs that demonstrate production-quality patterns. Whether you are a beginner learning to write your first system call or an experienced developer seeking deeper understanding of `futexes`, `epoll`, and kernel interfaces, this book provides the explanations, examples, and reference material you need to write robust, performant C software on Linux.

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