Boost Asio C Network Programming Cookbook Over 25 Hands On Recipes To Create Robust And Highly Effi Cient Cross Platform Distributed Applications With The Boost Asio Library

Filled with dozens of working code examples that illustrate the use of over 40 popular Boost libraries, this book takes you on a tour of Boost, helping you to independently build the libraries from source and use them in your own code. The first half of the book focuses on basic programming interfaces including generic containers and algorithms, strings, resource management, exception safety, and a miscellany of programming utilities that make everyday programming chores easy. Following a short interlude that introduces template metaprogramming and functional programming, the later chapters are devoted to systems programming interfaces, focusing on directory handling, I/O, concurrency, and network programming

Symbian OS continues to be the top operating system for smartphones across the world, with the number of Symbian OS phones sold now well beyond the 100 million mark. As more and more developers realize the huge opportunities available designing with Symbian OS, one of the first major obstacles they face is the sheer length of time it takes to start producing functional C++ applications for Symbian OS phones. "Quick Recipes on Symbian OS" provides easy-to-use recipes for mastering common development tasks. The book's structured, time-focused approach to becoming familiar with the basics allows readers to get up and running quickly. From the Author This book is meant as an entry point into the Symbian OS C++ development ecosystem. Our goal is to allow you to create a working prototype of your application for Symbian OS withing 2 weeks, using only this book, a computer, an internet connection and a Symbian phone. Inside, you will find reusable modules implementing the most common tasks developers usually have to labour on, along with enough information for you to understand them and integrate them into your own application. This book can be used in several ways: - as a learning exercise. - to complement a university course. - as a reference to keep on your desk.

A fast-paced, thorough introduction to modern C++ written for experienced programmers. After reading C++ Crash Course, you'll be proficient in the core language concepts, the C++ Standard Library, and the Boost Libraries. C++ is one of the most widely used languages for real-world software. In the hands of a knowledgeable programmer, C++ can produce small, efficient, and readable code that any programmer would be proud of. Designed for intermediate to advanced programmers, C++ Crash Course cuts through the weeds to get you straight to the core of C++17, the most modern revision of the ISO standard. Part 1 covers the core of the C++ language, where you'll learn about everything from types and functions, to the object life cycle and expressions. Part 2 introduces you to the C++ Standard Library and Boost Libraries, where you'll learn about all of the high-quality, fully-featured facilities available to you. You'll cover special utility classes, data structures, and algorithms, and learn how to manipulate file systems and build high-performance programs that communicate over networks. You'll learn all the major features of modern C++, including: • Fundamental types, reference types, and user-defined types • The object lifecycle including storage duration, memory management, exceptions, call stacks, and the RAII paradigm • Compile-time polymorphism with templates and run-time polymorphism with virtual classes • Advanced expressions, statements, and functions • Smart pointers, data structures, dates and times, numerics, and probability/statistics facilities • Containers, iterators, strings, and algorithms • Streams and files, concurrency, networking, and application development With well over 500 code samples and nearly 100 exercises, C++ Crash Course is sure to help you build a strong C++ foundation.

Uncover the secrets of functional programming using C# and change the way you approach your applications forever About This Book This book focuses on the functional paradigm of C#, which will give you a whole new angle on coding with C# It illustrates the advantages that functional programming brings to the table and the associated coding benefits This practical guide covers all the aspects of functional programming and provides solutions that can be applied in business scenarios Who This Book Is For This book is suitable for C# developers with basic prior knowledge of C# and with no functional programming experience at all. What You Will Learn Develop an application using the functional approach Implement unit testing to functionally program code Create efficient code using functional programming Work through a LINQ query so you can work with data Compose asynchronous programs to create a responsive application Use recursion in function programming in order to simplify code Optimize the program code using Laziness and Caching Techniques In Detail Functional programming makes your application faster, improves performance, and increases your productivity. C# code is written at a higher level of abstraction, so that code will be closer to business requirements, abstracting away many low-level implementation details. This book bridges the language gap for C# developers by showing you how to create and consume functional constructs in C#. We also bridge the domain gap by showing how functional constructs can be applied in business scenarios. We'll take you through lambda expressions and extension methods, and help you develop a deep understanding of the concepts and practices of LINQ and recursion in C#. By the end of the book, you will be able to write code using the best approach and will be able to perform unit testing in functional programming, changing how you write your applications and revolutionizing your projects. Style and approach This book takes a pragmatic approach and shows you techniques to write better functional constructs in C#. We'll also show you how these concepts can be applied in business scenarios.

C++ High Performance

Introduction to the Boost C++ Libraries

Handbook of Open Source Tools

Effective Modern C++

UNIX System V Network Programming

Functional C#

A pragmatic recipe book for acquiring a comprehensive understanding of the complexities and core fundamentals of C++ programming Key FeaturesExplore the latest language and library features of C++20 such as modules, coroutines, concepts, and rangesShed new light on the core concepts in C++ programming, including functions, algorithms, threading, and concurrency, through practical self-contained recipesLeverage C++ features like smart pointers, move semantics, constexpr, and more for increased robustness and performanceBook Description C++ has come a long way to be one of the most widely used general-purpose languages that is fast, efficient, and high-performance at its core. The updated second edition of Modern C++ Programming Cookbook addresses the latest features of C++20, such as modules, concepts, coroutines, and the many additions to the standard library, including ranges and text formatting. The book is organized in the form of practical recipes covering a wide range of problems faced by modern developers. The book also delves into the details of all the core concepts in modern C++ programming, such as functions and classes, iterators and algorithms, streams and the file system, threading and concurrency, smart pointers and move semantics, and many others. It goes into the performance aspects of programming in depth, teaching developers how to write fast and lean code with the help of best practices. Furthermore, the book explores useful patterns and delves into the implementation of many idioms, including pimpl, named parameter, and attorney-client, teaching techniques such as avoiding repetition with the factory pattern. There is also a chapter dedicated to unit testing, where you are introduced to three of the most widely used libraries for C++: Boost.Test, Google Test, and Catch2. By the end of the book, you will be able to effectively leverage the features and techniques of C++11/14/17/20 programming to enhance the performance, scalability, and efficiency of your applications. What you will learnUnderstand the new C++20 language and library features and the problems they solveBecome skilled at using the standard support for threading and concurrency for daily tasksLeverage the standard library and work with containers, algorithms, and iteratorsSolve text searching and replacement problems using regular expressionsWork with different types of strings and learn the various aspects of compilationTake advantage of the file system library to work with files and directoriesImplement various useful patterns and idiomsExplore the widely used testing frameworks for C++Who this book is for The book is designed for entry- or medium-level C++ programmers who have a basic knowledge of C++ and want to master the language and become prolific modern C++ developers. Experienced C++ programmers can leverage this book to strengthen their command of C++ and find a good reference to many language and library features of C++11/14/17/20.

Apply business requirements to IT infrastructure and deliver a high-quality product by understanding architectures such as microservices, DevOps, and cloud-native using modern C++ standards and features Key FeaturesDesign scalable large-scale applications with the C++ programming languageArchitect software solutions in a cloud-based environment with continuous integration and continuous delivery (CI/CD)Achieve architectural goals by leveraging design patterns, language features, and useful toolsBook Description Software architecture refers to the high-level design of complex applications. It is evolving just like the languages we use, but there are architectural concepts and patterns that you can learn to write high-performance apps in a high-level language without sacrificing readability and maintainability. If you're working with modern C++, this practical guide will help you put your knowledge to work and design distributed, large-scale apps. You'll start by getting up to speed with architectural concepts, including established patterns and rising trends, then move on to understanding what software architecture actually is and start exploring its components. Next, you'll discover the design concepts involved in application architecture and the patterns in software development, before going on to learn how to build, package, integrate, and deploy your components. In the concluding chapters, you'll explore different architectural qualities, such as maintainability, reusability, testability, performance, scalability, and security. Finally, you will get an overview of distributed systems, such as service-oriented architecture, microservices, and cloud-native, and understand how to apply them in application development. By the end of this book, you'll be able to build distributed services using modern C++ and associated tools to deliver solutions as per your clients' requirements. What you will learnUnderstand how to apply the principles of software architectureApply design patterns and best practices to meet your architectural goalsWrite elegant, safe, and performant code using the latest C++ featuresBuild applications that are easy to maintain and deployExplore the different architectural approaches and learn to apply them as per your requirementSimplify development and operations using application containersDiscover various techniques to solve common problems in software design and developmentWho this book is for This software architecture C++ programming book is for experienced C++ developers looking to become software architects or develop enterprise-grade applications.

Don't miss this guide to building networked and distributed applications for UNIX® System V. Using many helpful examples, the author provides a solid introduction to networking and UNIX programming, plus information on the programming interfaces most important to building communication software in System V, such as STREAMS, the Transport Layer Interface library, Sockets, and Remote Procedure Calls. The book also explains how to write kernel-level communication software, including STREAMS drivers, modules, and multiplexors. A final chapter on SLIP is essential reading.

Systems programming provides the foundation for the world's computation. Writing performance-sensitive code requires a programming language that puts programmers in control of how memory, processor time, and other system resources are used. The Rust systems programming language combines that control with a modern type system that catches broad classes of common mistakes, from memory management errors to data races between threads. With this practical guide, experienced systems programmers will learn how to successfully bridge the gap between performance and safety using Rust. Jim Blandy, Jason Orendorff, and Leonora Tindall demonstrate how Rust's features put programmers in control over memory consumption and processor use by combining predictable performance with memory safety and trustworthy concurrency. You'll learn: Rust's fundamental data types and the core concepts of ownership and borrowing How to write flexible, efficient code with traits and generics How to write fast, multithreaded code without data races Rust's key power tools: closures, iterators, and asynchronous programming Collections, strings and text, input and output, macros, unsafe code, and foreign function interfaces This revised, updated edition covers the Rust 2021 Edition.

C++ Crash Course

Mastering C++ Multithreading

C++ Data Structures and Algorithms

From Novice to Professional

The Definitive Guide to HTML5 WebSocket

C++ by Example includes 'UnderC,' an open-source language interpreter developed by the author, which shows the result of each new programming technique instantly, allowing novices to experiment in a more dynamic learning environment. The book starts with the fundamentals of the language, including expressions, variables, functions, and definitions and then covers the most common C++ features including Organizing data with Arrays Standard Algorithms and Containers Using Libraries within C++ programs Going beyond Arrays with Structures Using Pointers Manipulating data using Operators The second half of the book covers OOP, including Classes, Inheritance, Encapsulation, and more. The final chapters include useful command and library references and appendices covering the preprocessor and freeware C++ compilers.

The Definitive Guide to HTML5 WebSocket is the ultimate insider’s WebSocket resource. This revolutionary new web technology enables you to harness the power of true real-time connectivity and build responsive, modern web applications. This book contains everything web developers and architects need to know about WebSocket. It discusses how WebSocket-based architectures provide a dramatic reduction in unnecessary network overhead and latency compared to older HTTP (Ajax) architectures, how to layer widely used protocols such as XMPP and STOMP on top of WebSocket, and how to secure WebSocket connections and deploy WebSocket-based applications to the enterprise. Build real-time web applications with HTML5. This book: Introduces you to the WebSocket API and protocol Describes and provides real-world examples of protocol communication over WebSocket Explains WebSocket security and enterprise deployment

Over 25 hands-on recipes to create robust and highly-efficient cross-platform distributed applications with the Boost.Asio libraryAbout This Book• Build highly efficient distributed applications with ease• Enhance your cross-platform network programming skills with one of the most reputable C++ libraries• Find solutions to real-world problems related to network programming with ready-to-use recipes using this detailed and practical handbookWho This Book Is ForIf you want to enhance your C++ network programming skills using the Boost.Asio library and understand the theory behind development of distributed applications, this book is just what you need. The prerequisite for this book is experience with general C++11. To get the most from the book and comprehend advanced topics, you will need some background experience in multithreading.What You Will Learn• Boost your working knowledge of one of the most reputable C++ networking libraries—Boost.Asio• Familiarize yourself with the basics of TCP and UDP protocols• Create scalable and highly-efficient client and server applications• Understand the theory behind development of distributed applications• Increase the security of your distributed applications by adding SSL support• Implement a HTTP client easily• Use iostreams, scatter-gather buffers, and timersIn DetailStarting with recipes demonstrating the execution of basic Boost.Asio operations, the book goes on to provide ready-to-use implementations of client and server applications from simple synchronous ones to powerful multithreaded scalable solutions. Finally, you are presented with advanced topics such as implementing a chat application, implementing an HTTP client, and adding SSL support. All the samples presented in the book are ready to be used in real projects just out of the box.As well as excellent practical examples, the book also includes extended supportive theoretical material on distributed application design and construction.Style and approachThis book is a set of recipes, each containing the statement and description of a particular practical problem followed by code sample providing the solution to the problem and detailed step-by-step explanation. Recipes are grouped by topic into chapters and ordered by the level of complexity from basic to advanced.

Rcpp is the glue that binds the power and versatility of R with the speed and efficiency of C++. With Rcpp, the transfer of data between R and C++ is nearly seamless, and high-performance statistical computing is finally accessible to most R users. Rcpp should be part of every statistician's toolbox. -- Michael Braun, MIT Sloan School of Management "Seamless R and C++ integration with Rcpp" is simply a wonderful book. For anyone who uses C/C++ and R, it is an indispensable resource. The writing is outstanding. A huge bonus is the section on applications. This section covers the matrix packages Armadillo and Eigen and the GNU Scientific Library as well as RInside which enables you to use R inside C++. These applications are what most of us need to know to really do scientific programming with R and C++. I love this book. -- Robert McCulloch, University of Chicago Booth School of Business Rcpp is now considered an essential package for anybody doing serious computational research using R. Dirk's book is an excellent companion and takes the reader from a gentle introduction to more advanced applications via numerous examples and efficiency enhancing gems. The book is packed with all you might have ever wanted to know about Rcpp, its cousins (RcppArmadillo, RcppEigen .etc.), modules, package development and sugar. Overall, this book is a must-have on your shelf. -- Sanjog Misra, UCLA Anderson School of Management The Rcpp package represents a major leap forward for scientific computations with R. With very few lines of C++ code, one has R's data structures readily at hand for further computations in C++. Hence, high-level numerical programming can be made in C++ almost as easily as in R, but often with a substantial speed gain. Dirk is a crucial person in these developments, and his book takes the reader from the first fragile steps on to using the full Rcpp machinery. A very recommended book! -- Søren Højsgaard, Department of Mathematical Sciences, Aalborg University, Denmark "Seamless R and C ++ Integration with Rcpp" provides the first comprehensive introduction to Rcpp. Rcpp has become the most widely-used language extension for R, and is deployed by over one-hundred different CRAN and BioConductor packages. Rcpp permits users to pass scalars, vectors, matrices, list or entire R objects back and forth between R and C++ with ease. This brings the depth of the R analysis framework together with the power, speed, and efficiency of C++. Dirk Eddelbuettel has been a contributor to CRAN for over a decade and maintains around twenty packages. He is the Debian/Ubuntu maintainer for R and other quantitative software, edits the CRAN Task Views for Finance and High-Performance Computing, is a co-founder of the annual R/Finance conference, and an editor of the Journal of Statistical Software. He holds a Ph.D. in Mathematical Economics from EHESS (Paris), and works in Chicago as a Senior Quantitative Analyst.

Modern C++ Design

Practical Design Patterns for Network and Systems Programming

Mastering C++ Smartphone Development

Linux Device Drivers

Mastering the C++17 STL

Software Architecture with C++

Learn effective C++ network programming with Boost.Asio and become a proficient C++ network programmerAbout This Book- Learn efficient C++ network programming with minimum coding using Boost.Asio- Your one-stop destination to everything related to the Boost.Asio library- Explore the fundamentals of networking to choose designs with more examples, and learn the basics of Boost.Asio Who This Book Is ForThis book is for C++ Network programmers with basic knowledge of network programming, but no knowledge of how to use Boost.Asio for network programming.What You Will Learn- Prepare the tools to simplify network programming in C++ using Boost.Asio- Explore the networking concepts of IP addressing, TCP/IP ports and protocols, and LAN topologies- Get acquainted with the usage of the Boost libraries- Get to know more about the content of Boost.Asio network programming and Asynchronous programming- Establish communication between client and server by creating client-server application- Understand the various functions inside Boost.Asio C++ libraries to delve into network programming- Discover how to debug and run the code successfullyIn DetailBoost.Asio is a C++ library used for network programming operations.Organizations use Boost because of its productivity. Use of these high-quality libraries speed up initial development, result in fewer bugs, reduce reinvention-of-the-wheel, and cut long-term maintenance costs. Using Boost libraries gives an organization a head start in adopting new technologies.This book will teach you C++ Network programming using synchronous and asynchronous operations in Boost.Asio with minimum code, along with the fundamentals of Boost, server-client applications, debugging, and more.You will begin by preparing and setting up the required tools to simplify your network programming in C++ with Boost.Asio. Then you will learn about the basic concepts in networking such as IP addressing, TCP/IP protocols, and LAN with its topologies. This will be followed by an overview of the Boost libraries and their usage.Next you will get to know more about Boost.Asio and its concepts related to network programming. We will then go on to create a client-server application, helping you to understand the networking concepts. Moving on, you will discover how to use all the functions inside the Boost.Asio C++ libraries. Lastly, you will understand how to debug the code if there are errors found and will run the code successfully.Style and approachAn example-oriented book to show you the basics of networking and help you create a network application simply using Boost.Asio, with more examples for you to get up and running with Boost.Asio quickly.

C++ is one of the most widely-used programming languages and has applications in a variety of fields, such as gaming, GUI programming, and operating systems, to name a few. Through the years, C++ has evolved into (and remains) one of the top choices for software developers worldwide. This book will show you some notable C++ features and how to ...

Consistent, high-quality coding standards improve software quality, reduce time-to-market, promote teamwork, eliminate time wasted on inconsequential matters, and simplify maintenance. Now, two of the world's most respected C++ experts distill the rich collective experience of the global C++ community into a set of coding standards that every developer and development team can understand and use as a basis for their own coding standards. The authors cover virtually every facet of C++ programming: design and coding style, functions, operators, class design, inheritance, construction/destruction, copying, assignment, namespaces, modules, templates, genericity, exceptions, STL containers and algorithms, and more. Each standard is described concisely, with practical examples. From type definition to error handling, this book presents C++ best practices, including some that have only recently been identified and standardized-techniques you may not know even if you've used C++ for years. Along the way, you'll find answers to questions like What's worth standardizing--and what isn't? What are the best ways to code for scalability? What are the elements of a rational error handling policy? How (and why) do you avoid unnecessary initialization, cyclic, and definitional dependencies? When (and how) should you use static and dynamic polymorphism together? How do you practice "safe" overriding? When should you provide a no-fail swap? Why and how should you prevent exceptions from propagating across module boundaries? Why shouldn't you write namespace declarations or directives in a header file? Why should you use STL vector and string instead of arrays? How do you choose the right STL search or sort algorithm? What rules should you follow to ensure type-safe code? Whether you're working alone or with others, C++ Coding Standards will help you write cleaner code--and write it faster, with fewer hassles and less frustration.

Learn how to build efficient, secure and robust code in C++ by using data structures and algorithms - the building blocks of C++ Key Features Use data structures such as arrays, stacks, trees, lists, and graphs with real-world examples Learn the functional and reactive implementations of the traditional data structures Explore illustrations to present data structures and algorithms, as well as their analysis, in a clear, visual manner Book Description C++ is a general-purpose programming language which has evolved over the years and is used to develop software for many different sectors. This book will be your companion as it takes you through implementing classic data structures and algorithms to help you get up and running as a confident C++ programmer. We begin with an introduction to C++ data structures and algorithms while also covering essential language constructs. Next, we will see how to store data using linked lists, arrays, stacks, and queues. Then, we will learn how to implement different sorting algorithms, such as quick sort and heap sort. Along with these, we will dive into searching algorithms such as linear search, binary search and more. Our next mission will be to attain high performance by implementing algorithms to string datatypes and implementing hash structures in algorithm design. We'll also analyze Brute Force algorithms, Greedy algorithms, and more. By the end of the book, you'll know how to build components that are easy to understand, debug, and use in different applications. What you will learn Know how to use arrays and lists to get better results in complex scenarios Build enhanced applications by using hashtables, dictionaries, and sets Implement searching algorithms such as linear search, binary search, jump search, exponential search, and more Have a positive impact on the efficiency of applications with tree traversal Explore the design used in sorting algorithms like Heap sort, Quick sort, Merge sort and Radix sort Implement various common algorithms in string data types Find out how to design an algorithm for a specific task using the common algorithm paradigms Who this book is for This book is for developers who would like to learn the Data Structures and Algorithms in C++. Basic C++ programming knowledge is expected.

Beginning C++20

42 Specific Ways to Improve Your Use of C++11 and C++14

Learn how to write efficient code to build scalable and robust applications in C++

Beginning C++17

Make full use of the standard library components in C++17

Learn socket programming in C and write secure and optimized network code

A comprehensive guide to programming with network sockets, implementing Internet protocols, designing IoT devices, and much more with C Key FeaturesLeverage your C or C++ programming skills to build powerful network applicationsGet to grips with a variety of network protocols that allow you to load web pages, send emails, and do much moreWrite portable network code for operating systems such as Windows, Linux, and macOSBook Description Network programming, a challenging topic in C, is made easy to understand with a careful exposition of socket programming APIs. This book gets you started with modern network programming in C and the right use of relevant operating system APIs. This book covers core concepts, such as hostname resolution with DNS, that are crucial to the functioning of the modern web. You’ll delve into the fundamental network protocols, TCP and UDP. Essential techniques for networking paradigms such as client-server and peer-to-peer models are explained with the help of practical examples. You’ll also study HTTP and HTTPS (the protocols responsible for web pages) from both the client and server perspective. To keep up with current trends, you’ll apply the concepts covered in this book to gain insights into web programming for IoT. You’ll even get to grips with network monitoring and implementing security best practices. By the end of this book, you’ll have experience of working with client-server applications, and be able to implement new network programs in C. The code in this book is compatible with the older C99 version as well as the latest C18 and C++17 standards. Special consideration is given to writing robust, reliable, and secure code that is portable across operating systems, including Winsock sockets for Windows and POSIX sockets for Linux and macOS. What you will learnUncover cross-platform socket programming APIsImplement techniques for supporting IPv4 and IPv6Understand how TCP and UDP connections work over IPDiscover how hostname resolution and DNS workInterface with web APIs using HTTP and HTTPSAcquire hands-on experience with Simple Mail Transfer Protocol (SMTP)Apply network programming to the Internet of Things (IoT)Who this book is for If you're a developer or a system administrator who wants to enter the world of network programming, this book is for you. Basic knowledge of C programming is assumed.

Learn how to program using the updated C++17 language. You'll start with the basics and progress through step-by-step examples to become a working C++ programmer. All you need are Beginning C++17 and any recent C++ compiler and you'll soon be writing real C++ programs. There is no assumption of prior programming knowledge. All language concepts that are explained in the book are illustrated with working program examples, and all chapters include exercises for you to test and practice your knowledge. Code downloads are provided for all examples from the text and solutions to the exercises. This latest edition has been fully updated to the latest version of the language, C++17, and to all conventions and best practices of so-called modern C++. Beginning C++17 also introduces the elements of the C++ Standard Library that provide essential support for the C++17 language. What You'll Learn Define variables and make decisions Work with arrays and loops, pointers and references, strings, and more Write your own functions, types, and operators Discover the essentials of object-oriented programming Use overloading, inheritance, virtual functions and polymorphism Write generic function templates and class templates Get up to date with modern C++ features: auto type declarations, move semantics, lambda expressions, and more Examine the new additions to C++17 Who This Book Is For Programmers new to C++ and those who may be looking for a refresh primer on the C++17 programming language in general.

Handbook of Open Source Tools introduces a comprehensive collection of advanced open source tools useful in developing software applications. The book contains information on more than 200 open-source tools which include software construction utilities for compilers, virtual-machines, database, graphics, high-performance computing, OpenGL, geometry, algebra, graph theory , GUIs and more. Special highlights for software construction utilities and application libraries are included. Each tool is covered in the context of a real like application development setting. This unique handbook presents a comprehensive discussion of advanced tools, a valuable asset used by most application developers and programmers; includes a special focus on Mathematical Open Source Software not available in most Open Source Software books, and introduces several tools (eg ACL2, CLIPS, CUDA, and COIN) which are not known outside of select groups, but are very powerful. Handbook of Open Source Tools is designed for application developers and programmers working with Open Source Tools. Advanced-level students concentrating on Engineering, Mathematics and Computer Science will find this reference a valuable asset as well.

This book is intended for developers and engineers with some familiarity of operating system concepts as implemented by Linux. A basic background in C code would be helpful. Their positions range from hobbyists wanting to secure their Android powered creations to OEM engineers building handsets to engineers of emerging areas where Android is seeing growth.

A Fast-Paced Introduction

Modern C++ Programming Cookbook

Programming Rust

Master C++ core language and standard library features, with over 100 recipes, updated to C++20, 2nd Edition

Boost and optimize the performance of your C++17 code

Boost C++ Application Development Cookbook

Provides information on writing a driver in Linux, covering such topics as character devices, network interfaces, driver debugging, concurrency, and interrupts.

This book breaks down the C++ STL, teaching you how to extract its gems and apply them to your programming. About This Book Boost your productivity as a C++ developer with the latest features of C++17 Develop high-quality, fast, and portable applications with the varied features of the STL Migrate from older versions (C++11, C++14) to C++17 Who This Book Is For This book is for developers who would like to master the C++ STL and make full use of its components. Prior C++ knowledge is assumed. What You Will Learn Make your own iterator types, allocators, and thread pools. Master every standard container and every standard algorithm. Improve your code by replacing new/delete with smart pointers. Understand the difference between monomorphic algorithms, polymorphic algorithms, and generic algorithms. Learn the meaning and applications of vocabulary type, product type and sum type. In Detail Modern C++ has come a long way since 2011. The latest update, C++17, has just been ratified and several implementations are on the way. This book is your guide to the C++ standard library, including the very latest C++17 features. The book starts by exploring the C++ Standard Template Library in depth. You will learn the key differences between classical polymorphism and generic programming, the foundation of the STL. You will also learn how to use the various algorithms and containers in the STL to suit your programming needs. The next module delves into the tools of modern C++. Here you will learn about algebraic types such as std::optional, vocabulary types such as std::function, smart pointers, and synchronization primitives such as std::atomic and std::mutex. In the final module, you will learn about C++'s support for regular expressions and file I/O. By the end of the book you will be proficient in using the C++17 standard library to implement real programs, and you'll have gained a solid understanding of the library's own internals. Style and approach This book takes a concise but comprehensive approach to explaining and applying the C++ STL, one feature at a time.

Over 25 hands-on recipes to create robust and highly-efficient cross-platform distributed applications with the Boost.Asio library About This Book Build highly efficient distributed applications with ease Enhance your cross-platform network programming skills with one of the most reputable C++ libraries Find solutions to real-world problems related to network programming with ready-to-use recipes using this detailed and practical handbook Who This Book Is For If you want to enhance your C++ network programming skills using the Boost.Asio library and understand the theory behind development of distributed applications, this book is just what you need. The prerequisite for this book is experience with general C++11. To get the most from the book and comprehend advanced topics, you will need some background experience in multithreading. What You Will Learn Boost your working knowledge of one of the most reputable C++ networking libraries—Boost.Asio Familiarize yourself with the basics of TCP and UDP protocols Create scalable and highly-efficient client and server applications Understand the theory behind development of distributed applications Increase the security of your distributed applications by adding SSL support Implement a HTTP client easily Use iostreams, scatter-gather buffers, and timers In Detail Starting with recipes demonstrating the execution of basic Boost.Asio operations, the book goes on to provide ready-to-use implementations of client and server applications from simple synchronous ones to powerful multithreaded scalable solutions. Finally, you are presented with advanced topics such as implementing a chat application, implementing an HTTP client, and adding SSL support. All the samples presented in the book are ready to be used in real projects just out of the box. As well as excellent practical examples, the book also includes extended supportive theoretical material on distributed application design and construction. Style and approach This book is a set of recipes, each containing the statement and description of a particular practical problem followed by code sample providing the solution to the problem and detailed step-by-step explanation. Recipes are grouped by topic into chapters and ordered by the level of complexity from basic to advanced.

This book analyzes the application of the legal principle of non-discrimination in the context of energy network operation. Since the early 1990s, the duty not to discriminate has applied to energy network operators, in order to achieve a liberalized European energy market in which European consumers have a free and real choice of energy supplier. The book provides guidance to those working in the context of the non-discrimination obligation, such as energy network operators, regulatory authorities, national courts, and other energy market players, as well as those studying the rules for (academic) research purposes. The book's conclusions serve as a tool for critical consideration and offer suggestions for improvements to the legal framework and its application on a European, as well as a national, level. Several questions are answered, including why energy network operators have a non-discrimination obligation in the context of energy market liberalization, how European law has tried to remove and control the discrimination problem since the early 1990s, and when different treatment of energy network users amounts to 'forbidden' discrimination. The book's conclusions are underpinned by comparisons with competition law, public procurement law, and telecommunications law, as well as a case study on how energy network operators and regulators in several Member States currently interpret and apply the non-discrimination obligation. (Series: Energy & Law - Vol. 15)

Foundations of Python Network Programming

Programming with POSIX Threads

Mastering Complexity with ACE and Patterns, Portable Documents

C++ Network Programming, Volume I

The Boost C++ Libraries

Boost. Asio C++ Network Programming - Second Edition

Begin your programming journey with C++ including the C++20 standard. You'll start with the basics and progress through step-by-step examples to become a working C++ programmer. This book will include new features like parallelism, coroutines, modules, networking, ranges, and reflections. All you need are Beginning C++20 and any recent C++ compiler and you'll soon be writing real C++ programs. There is no assumption of prior programming knowledge. All language concepts that are explained in the book are illustrated with working program examples, and all chapters include exercises for you to test and practice your knowledge. Free source code downloads are provided for all examples from the text and solutions to the exercises. This latest edition has been fully updated to the latest version of the language, C++20, and to all conventions and best practices of modern C++. Beginning C++20 also introduces the elements of the C++ Standard Library that provide essential support for the C++20 language. What You Will Learn Begin programming with C++20 standard Carry out modular programming in C++ Work with arrays and loops, pointers and references, strings, and more Write your own functions, types, and operators Discover the essentials of object-oriented programming Use overloading, inheritance, virtual functions, and polymorphism Write generic function templates and class templates Use coroutines, parallelism, ranges, auto type declarations, move semantics, lambda expressions, and much more Who This Book Is For Programmers new to C++ and those who may be looking for a refresh primer on C++ in general.

Write code that scales across CPU registers, multi-core, and machine clusters Key Features Explore concurrent programming in C++ Identify memory management problems Use SIMD and STL containers for performance improvement Book Description C++ is a highly portable language and can be used to write both large-scale applications and performance-critical code. It has evolved over the last few years to become a modern and expressive language. This book will guide you through optimizing the performance of your C++ apps by allowing them to run faster and consume fewer resources on the device they're running on without compromising the readability of your code base. The book begins by helping you measure and identify bottlenecks in a C++ code base. It then moves on by teaching you how to use modern C++ constructs and techniques. You'll see how this affects the way you write code. Next, you'll see the importance of data structure optimization and memory management, and how it can be used efficiently with respect to CPU caches. After that, you'll see how STL algorithm and composable Range V3 should be used to both achieve faster execution and more readable code, followed by how to use STL containers and how to write your own specialized iterators. Moving on, you'll get hands-on experience in making use of modern C++ metaprogramming and reflection to reduce boilerplate code as well as in working with proxy objects to perform optimizations under the hood. After that, you'll learn concurrent programming and understand lock-free data structures. The book ends with an overview of parallel algorithms using STL execution policies, Boost Compute, and OpenCL to utilize both the CPU and the GPU. What you will learn Benefits of modern C++ constructs and techniques Identify hardware bottlenecks, such as CPU cache misses, to boost performance Write specialized data structures for performance-critical code Use modern metaprogramming techniques to reduce runtime calculations Achieve efficient memory management using custom memory allocators Reduce boilerplate code using reflection techniques Reap the benefits of lock-free concurrent programming Perform under-the-hood optimizations with preserved readability using proxy objects Gain insights into subtle optimizations used by STL algorithms Utilize the Range V3 library for expressive C++ code Parallelize your code over CPU and GPU, without compromising readability Who this book is for If you're a C++ developer looking to improve the speed of your code or simply wanting to take your skills up to the next level, then this book is perfect for you.

As networks, devices, and systems continue to evolve, software engineers face the unique challenge of creating reliable distributed applications within frequently changing environments. C++ Network Programming, Volume 1, provides practical solutions for developing and optimizing complex distributed systems using the ADAPTIVE Communication Environment (ACE), a revolutionary open-source framework that runs on dozens of hardware platforms and operating systems. This book guides software professionals through the traps and pitfalls of developing efficient, portable, and flexible networked applications. It explores the inherent design complexities of concurrent networked applications and the tradeoffs that must be considered when working to master them. C++ Network Programming begins with an overview of the issues and tools involved in writing distributed concurrent applications. The book then provides the essential design dimensions, patterns, and principles needed to develop flexible and efficient concurrent networked applications. The book's expert author team shows you how to enhance design skills while applying C++ and patterns effectively to develop object-oriented networked applications. Readers will find coverage of: C++ network programming, including an overview and strategies for addressing common development challenges The ACE Toolkit Connection protocols, message exchange, and message-passing versus shared memory Implementation methods for reusable networked application services Concurrency in object-oriented network programming Design principles and patterns for ACE wrapper facades With this book, C++ developers have at their disposal the most complete toolkit available for developing successful, multiplatform, concurrent networked applications with ease and efficiency.

The second edition of The Boost C++ Libraries introduces 72 Boost libraries that provide a wide range of useful capabilities. They help you manage memory and process strings more easily. They provide containers and other data structures that go well beyond what the standard library offers. They make it easy to build platform-independent network applications. Simply put, these 72 libraries greatly expand your C++ toolbox. The second edition contains more than 430 examples. All examples are as short as possible, but they are complete, so you can compile and run them as is. They show you what the Boost libraries offer and give you a head start on using the libraries in your own applications. The goal of this book is to increase your efficiency as a C++ developer and to simplify software development with C++. The Boost libraries introduced in this book will help you write less code with fewer bugs and finish projects faster. You code will be more concise and self-explanatory and more easily adapted when requirements change. The second edition is based on the Boost libraries 1.55.0 and 1.56.0 with the latter version having been released in August 2014. The examples are based on C++11 and have been tested with Visual Studio 2013, GCC 4.8 and Clang 3.3 on various platforms. For Boost libraries which were incorporated into the C++11 standard library, differences between Boost and the standard library are highlighted. The Boost libraries are one of the most important and influential open source C++ libraries. Their source code is available under a permissive free software license. Several Boost libraries have been incorporated into the C++11 standard library. The Boost libraries are developed and supported by the Boost community - a worldwide developer community with a strong interest in pushing C++ boundaries further.

Boost.Asio C++ Network Programming Cookbook

Boost.Asio C++ Network Programming

Generic Programming and Design Patterns Applied

Foundations

101 Rules, Guidelines, and Best Practices

Become an expert programmer by solving real-world problems

Here is a programmer's guide to using and programming POSIX threads, commonly known as Pthreads. A "coder's book", this title tells how to use Pthreads in the real world, making efficient and portable applications. Pthreads are an important set of current tools programmers need to have in today's network-intensive climate.

A comprehensive guide to help aspiring and professional C++ developers elevate the performance of their apps by allowing them to run faster and consume fewer resources Key FeaturesUpdated to C++20 with completely revised code and more content on error handling, benchmarking,

memory allocators, and concurrent programmingExplore the latest C++20 features including concepts, ranges, and coroutinesUtilize C++ constructs and techniques to carry out effective data structure optimization and memory managementBook Description C++ High Performance, Second Edition guides you through optimizing the performance of your C++ apps. This allows them to run faster and consume fewer resources on the device they're running on without compromising the readability of your codebase. The book begins by introducing the C++ language and some of its modern concepts in brief. Once you are familiar with the fundamentals, you will be ready to measure, identify, and eradicate bottlenecks in your C++ codebase. By following this process, you will gradually improve your style of writing code. The book then explores data structure optimization, memory management, and how it can be used efficiently concerning CPU caches. After laying the foundation, the book trains you to leverage algorithms, ranges, and containers from the standard library to achieve faster execution, write readable code, and use customized iterators. It provides hands-on examples of C++ metaprogramming, coroutines, reflection to reduce boilerplate code, proxy objects to perform optimizations under the hood, concurrent programming, and lock-free data structures. The book concludes with an overview of parallel algorithms. By the end of this book, you will have the ability to use every tool as needed to boost the efficiency of your C++ projects. What you will learnWrite specialized data structures for performance-critical codeUse modern metaprogramming techniques to reduce runtime calculationsAchieve efficient memory management using custom memory allocatorsReduce boilerplate code using reflection techniquesReap the benefits of lock-free concurrent programmingGain insights into subtle optimizations used by standard library algorithmsCompose algorithms using ranges libraryDevelop the ability to apply metaprogramming aspects such as constexpr, constraints, and conceptsImplement lazy generators and asynchronous tasks using C++20 coroutinesWho this book is for If you're a C++ developer looking to improve the efficiency of your code or just keen to upgrade your skills to the next level, this book is for you.

Do you need to develop flexible software that can be customized quickly? Do you need to add the power and efficiency of frameworks to your software? The ADAPTIVE Communication Environment (ACE) is an open-source toolkit for building high-performance networked applications and next-generation middleware. ACE's power and flexibility arise from object-oriented frameworks, used to achieve the systematic reuse of networked application software. ACE frameworks handle common network programming tasks and can be customized using C++ language features to produce complete distributed applications. C++ Network Programming, Volume 2, focuses on ACE frameworks, providing thorough coverage of the concepts, patterns, and usage rules that form their structure. This book is a practical guide to designing object-oriented frameworks and shows developers how to apply frameworks to concurrent networked applications. C++ Networking, Volume 1, introduced ACE and the wrapper facades, which are basic network computing ingredients. Volume 2 explains how frameworks build on wrapper facades to provide higher-level communication services. Written by two experts in the ACE community, this book contains: An overview of ACE frameworks Design dimensions for networked services Descriptions of the key capabilities of the most important ACE frameworks Numerous C++ code examples that demonstrate how to use ACE frameworks C++ Network Programming, Volume 2, teaches how to use frameworks to write networked applications quickly, reducing development effort and overhead. It will be an invaluable asset to any C++ developer working on networked applications.

Presents a collection of reusable design artifacts, called generic components, together with the techniques that make them possible. The author describes techniques for policy-based design, partial template specialization, typelists, and local classes, then goes on to implement generic components for smart pointers, object factories, functor objects, the Visitor design pattern, and multimethod engines. c. Book News Inc.

Hands-On Network Programming with C

Master the art of optimizing the functioning of your C++ code, 2nd Edition

C++ Network Programming, Volume 2

Exploring SE for Android

C++ Coding Standards

Learning C++ Functional Programming

Learn effective C++ network programming with Boost.Asio and become a proficient C++ network programmer About This Book Learn efficient C++ network programming with minimum coding using Boost.Asio Your one-stop destination to everything related to the Boost.Asio library Explore the fundamentals of networking to choose designs with more examples, and learn the basics of Boost.Asio Who This Book Is For This book is for C++ Network programmers with basic knowledge of network programming, but no knowledge of how to use Boost.Asio for network programming. What You Will Learn Prepare the tools to simplify network programming in C++ using Boost.Asio Explore the networking concepts of IP addressing, TCP/IP ports and protocols, and LAN topologies Get acquainted with the usage of the Boost libraries Get to know more about the content of Boost.Asio network programming and Asynchronous programming Establish communication between client and server by creating client-server application Understand the various functions inside Boost.Asio C++ libraries to delve into network programming Discover how to debug and run the code successfully In Detail Boost.Asio is a C++ library used for network programming operations. Organizations use Boost because of its productivity. Use of these high-quality libraries speed up initial development, result in fewer bugs, reduce reinvention-of-the-wheel, and cut long-term maintenance costs. Using Boost libraries gives an organization a head start in adopting new technologies. This book will teach you C++ Network programming using synchronous and asynchronous operations in Boost.Asio with minimum code, along with the fundamentals of Boost, server-client applications, debugging, and more. You will begin by preparing and setting up the required tools to simplify your network programming in C++ with Boost.Asio. Then you will learn about the basic concepts in networking such as IP addressing, TCP/IP protocols, and LAN with its topologies. This will be followed by an overview of the Boost libraries and their usage. Next you will get to know more about Boost.Asio and its concepts related to network programming. We will then go on to create a client-server application, helping you to understand the networking concepts. Moving on, you will discover how to use all the functions inside the Boost.Asio C++ libraries. Lastly, you will understand how to debug the code if there are errors found and will run the code successfully. Style and approach An example-oriented book to show you the basics of networking and help you create a network application simply using Boost.Asio, with more examples for you to get up and running with Boost.Asio quickly.

Learn to build applications faster and better by leveraging the real power of Boost and C++ About This Book Learn to use the Boost libraries to simplify your application development Learn to develop high quality, fast and portable applications Learn the relations between Boost and C++11/C++4/C++17 Who This Book Is For This book is for developers looking to improve their knowledge of Boost and who would like to simplify their application development processes. Prior C++ knowledge and basic knowledge of the standard library is assumed. What You Will Learn Get familiar with new data types for everyday use Use smart pointers to manage resources Get to grips with compile-time computations and assertions Use Boost libraries for multithreading Learn about parallel execution of different task Perform common string-related tasks using Boost libraries Split all the processes, computations, and interactions to tasks and process them independently Learn the basics of working with graphs, stacktracing, testing and interprocess communications Explore different helper macros used to detect compiler, platform and Boost features In Detail If you want to take advantage of the real power of Boost and C++ and avoid the confusion about which library to use in which situation, then this book is for you. Beginning with the basics of Boost C++, you will move on to learn how the Boost libraries simplify application development. You will learn to convert data such as string to numbers, numbers to string, numbers to numbers and more. Managing resources will become a piece of cake. You'll see what kind of work can be done at compile time and what Boost containers can do. You will learn everything for the development of high quality fast and portable applications. Write a program once and then you can use it on Linux, Windows, MacOS, Android operating systems. From manipulating images to graphs, directories, timers, files, networking – everyone will find an interesting topic. Be sure that knowledge from this book won't get outdated, as more and more Boost libraries become part of the C++ Standard.

C++ is one of the most important and influential programming languages for application development. It supports the modular, object- oriented and generic programming models and its flexibility has been one of the main reasons why it has been so successful. With the emergence of the Boost Libraries (www.boost.org) we see that C++ is brought to a new level, namely a set of reusable and modular template libraries that C++ developers can use in their applications. This book is dedicated to a number of Boost libraries for higher-order functions, data types and data structures, libraries for text and string processing, multi-threading, random number generation and more. We also discuss how Boost and design patterns are used to promote the flexibility of code. Each library is described in a step-by-step manner. Numerous examples are given to show the functionality of each library. The full source code is freely available to purchasers of the book. Coverage Includes Understanding and using 30 major Boost libraries. Learn about higher-order functions, data structures, memory management, multi-threading and more. Using Boost in new and existing applications. Integrating Boost and the Gang-Of-Four design patterns. Ready-to-run projects for Visual Studio. Appendices and exercises."

Boost.Asio C++ Network Programming CookbookPackt Publishing Ltd

Systematic Reuse with ACE and Frameworks

Seamless R and C++ Integration with Rcpp

C++ by Example

The ACE Programmer's Guide

The The Modern C++ Challenge

Quick Recipes on Symbian OS

Coming to grips with C++11 and C++14 is more than a matter of familiarizing yourself with the features they introduce (e.g., auto type declarations, move semantics, lambda expressions, and concurrency support). The challenge is learning to use those features effectively—so that your software is correct, efficient, maintainable, and portable. That's where this practical book comes in. It describes how to write truly great software using C++11 and C++14—i.e. using modern C++. Topics include: The pros and cons of braced initialization, noexcept specifications, perfect forwarding, and smart pointer make functions The relationships among std::move, std::forward, rvalue references, and universal references Techniques for writing clear, correct, effective lambda expressions How std::atomic differs from volatile, how each should be used, and how they relate to C++'s concurrency API How best practices in "old" C++ programming (i.e., C++98) require revision for software development in modern C++ Effective Modern C++ follows the proven guideline-based, example-driven format of Scott Meyers' earlier books, but covers entirely new material. "After I learned the C++ basics, I then learned how to use C++ in production code from Meyer's series of Effective C++ books. Effective Modern C++ is the most important how-to book for advice on key guidelines, styles, and idioms to use modern C++ effectively and well. Don't own it yet? Buy this one. Now". -- Herb Sutter, Chair of ISO C++ Standards Committee and C++ Software Architect at Microsoft

** Covers low-level networking in Python —essential for writing a new networked application protocol. * Many working examples demonstrate concepts in action -- and can be used as starting points for new projects. * Networked application security is demystified. * Exhibits and explains multitasking network servers using several models, including forking, threading, and non-blocking sockets. * Features extensive coverage of Web and E-mail. Describes Python's database APIs.*

Apply Functional Programming techniques to C++ to build highly modular, testable, and reusable code About This Book Modularize your applications and make them highly reusable and testable Get familiar with complex concepts such as metaprogramming, concurrency, and immutability A highly practical guide to building functional code in C++ filled with lots of examples and real-world use cases Who This Book Is For This book is for C++ developers comfortable with OOP who are interested in learning how to apply the functional paradigm to create robust and testable apps. What You Will Learn Get to know the difference between imperative and functional approaches See the use of first-class functions and pure functions in a functional style Discover various techniques to apply immutable state to avoid side effects Design a recursive algorithm effectively Create faster programs using lazy evaluation Structure code using design patterns to make the design process easier Use concurrency techniques to develop responsive software Learn how to use the C++ Standard Template Library and metaprogramming in a functional way to improve code optimization In Detail Functional programming allows developers to divide programs into smaller, reusable components that ease the creation, testing, and maintenance of software as a whole. Combined with the power of C++, you can develop robust and scalable applications that fulfill modern day software requirements. This book will help you discover all the C++ 17 features that can be applied to build software in a functional way. The book is divided into three modules—the first introduces the fundamentals of functional programming and how it is supported by modern C++. The second module explains how to efficiently implement C++ features such as pure functions and immutable states to build robust applications. The last module describes how to achieve concurrency and apply design patterns to enhance your application's performance. Here, you will also learn to optimize code using metaprogramming in a functional way. By the end of the book, you will be familiar with the functional approach of programming and will be able to use these techniques on a daily basis. Style and approach This book uses a module-based approach, where each module will cover important aspects of functional programming in C++ and will help you develop efficient and robust applications through gaining a practical understanding.

Master multithreading and concurrent processing with C++ About This Book Delve into the fundamentals of multithreading and concurrency and find out how to implement them Explore atomic operations to optimize code performance Apply concurrency to both distributed computing and GPGPU processing Who This Book Is For This book is for intermediate C++ developers who wish to extend their knowledge of multithreading and concurrent processing. You should have basic experience with multithreading and be comfortable using C++ development toolchains on the command line. What You Will Learn Deep dive into the details of the how various operating systems currently implement multithreading Choose the best multithreading APIs when designing a new application Explore the use of mutexes, spin-locks, and other synchronization concepts and see how to safely pass data between threads Understand the level of API support provided by various C++ toolchains Resolve common issues in multithreaded code and recognize common pitfalls using tools such as Memcheck, CacheGrind, DRD, Helgrind, and more Discover the nature of atomic operations and understand how they can be useful in optimizing code Implement a multithreaded application in a distributed computing environment Design a C++-based GPGPU application that employs multithreading In Detail Multithreaded applications execute multiple threads in a single processor environment, allowing developers achieve concurrency. This book will teach you the finer points of multithreading and concurrency concepts and how to apply them efficiently in C++. Divided into three modules, we start with a brief introduction to the fundamentals of multithreading and concurrency concepts. We then take an in-depth look at how these concepts work at the hardware-level as well as how both operating systems and frameworks use these low-level functions. In the next module, you will learn about the native multithreading and concurrency support available in C++ since the 2011 revision, synchronization and communication between threads, debugging concurrent C++ applications, and the best programming practices in C++. In the final module, you will learn about atomic operations before moving on to apply concurrency to distributed and GPGPU-based processing. The comprehensive coverage of essential multithreading concepts means you will be able to efficiently apply multithreading concepts while coding in C++. Style and approach This book is filled with examples that will help you become a master at writing robust concurrent and parallel applications in C++.

Design modern systems using effective architecture concepts, design patterns, and techniques with C++20

The C++ Programming Language

Learning Boost C++ Libraries