Concurrency Lock Concurrent Linked List In Java

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Concurrency Lock Concurrent Linked List In Java ***2021-11-02***

NOELLE ANDREWS

Static Analysis Springer Science & Business Media
This Expert Guide gives you the techniques and technologies in embedded multicore to optimally design and implement your embedded system. Written by experts with a solutions focus, this encyclopedic reference gives you an indispensable aid to tackling the day-to-day problems when building and managing multicore embedded systems. Following an embedded system design path from start to finish, our team of experts takes you from architecture, through hardware implementation to software programming and debug. With this book you will learn: • What motivates multicore • The architectural options and tradeoffs; when to use what • How to deal with the unique hardware challenges that multicore presents • How to manage the software infrastructure in a multicore environment • How to write effective multicore programs • How to port legacy code into a multicore system and partition legacy software • How to optimize both the system and software • The particular challenges of debugging multicore hardware and software Examples demonstrating timeless implementation details Proven and practical techniques reflecting the authors' expertise built from years of experience and key advice on tackling critical issues
Parallel Computing Technologies CRC Press
Threads are a fundamental part of the Java platform. As multicore processors become the norm, using concurrency effectively becomes essential for building high-performance applications. Java SE 5 and 6 are a huge step forward for the development of concurrent applications, with improvements to the Java Virtual Machine to support high-performance, highly scalable concurrent classes and a rich set of new concurrency building blocks. In Java Concurrency in Practice , the creators of these new facilities explain not only how they work and how to use them, but also the motivation and design patterns behind them. However, developing, testing, and debugging multithreaded

programs can still be very difficult; it is all too easy to create concurrent programs that appear to work, but fail when it matters most: in production, under heavy load. Java Concurrency in Practice arms readers with both the theoretical underpinnings and concrete techniques for building reliable, scalable, maintainable concurrent applications. Rather than simply offering an inventory of concurrency APIs and mechanisms, it provides design rules, patterns, and mental models that make it easier to build concurrent programs that are both correct and performant. This book covers: Basic concepts of concurrency and thread safety Techniques for building and composing thread-safe classes Using the concurrency building blocks in java.util.concurrent Performance optimization dos and don'ts Testing concurrent programs Advanced topics such as atomic variables, nonblocking algorithms, and the Java Memory Model

Distributed Computing Springer

This festschrift was written in honor of Andrew William (Bill) Roscoe on the occasion of his 60th birthday, and features tributes by Sir Tony Hoare, Stephen Brookes, and Michael Wooldridge. Bill Roscoe is an international authority in process algebra, and has been the driving force behind the development of the FDR refinement checker for CSP. He is also world renowned for his pioneering work in analyzing security protocols, modeling information flow, human-interactive security, and much more. Many of these areas are reflected in the 15 invited research articles in this festschrift, and in the presentations at the "BILL-60" symposium held in Oxford, UK, on January 9 and 10, 2017.

Concurrent Programming on Windows John Wiley & Sons

Programming multi-core and many-core computing systems Sabri Pllana, Linnaeus University, Sweden Fatos Xhafa, Technical University of Catalonia, Spain Provides state-of-the-art methods for programming multi-core and many-core systems The book comprises a selection of twenty two chapters covering: fundamental techniques and algorithms; programming approaches; methodologies and frameworks; scheduling and management; testing and evaluation methodologies; and case studies for programming multi-core and many-core systems. Program development for multi-core processors, especially for heterogeneous multi-core processors, is significantly more complex than for single-core processors. However, programmers have been traditionally trained for the development of sequential programs, and only a small percentage of them have experience with parallel programming. In the past, only a relatively small group of programmers interested in High Performance Computing (HPC) was concerned with the parallel programming issues, but the situation has changed dramatically with the appearance of multi-core processors on commonly used computing systems. It is expected that with the pervasiveness of multi-core processors, parallel programming will become mainstream. The pervasiveness of multi-core processors affects a large spectrum of systems, from embedded and general-purpose, to high-end computing systems. This book assists programmers in mastering the efficient programming of multi-core systems, which is of paramount importance for the software-intensive industry towards a more effective product-development cycle.

Key features: Lessons, challenges, and roadmaps ahead. Contains real world examples and case studies. Helps programmers in mastering the efficient programming of multi-core and many-core systems. The book serves as a reference for a larger audience of practitioners, young researchers and graduate level students. A basic level of programming knowledge is required to use this book.

Distributed Computing Pearson Education

Revised and updated with improvements conceived in parallel programming courses, The Art of Multiprocessor Programming is an authoritative guide to multicore programming. It introduces a higher level set of software development skills than that needed for efficient single-core programming. This book provides comprehensive coverage of the new principles, algorithms, and tools necessary for effective multiprocessor programming. Students and professionals alike will benefit from thorough coverage of key multiprocessor programming issues. This revised edition incorporates much-demanded updates throughout the book, based on feedback and corrections reported from classrooms since 2008 Learn the fundamentals of programming multiple threads accessing shared memory Explore mainstream concurrent data structures and the key elements of their design, as well as synchronization techniques from simple locks to transactional memory systems Visit the companion site and download source code, example Java programs, and materials to support and enhance the learning experience

Shared-Memory Synchronization Springer

Learn the art of building intricate, modern, scalable, and concurrent applications using Scala About This Book Make the most of Scala by understanding its philosophy and harnessing the power of multicores Get acquainted with cutting-edge technologies in the field of concurrency, through practical, real-world applications Get this step-by-step guide packed with pragmatic examples Who This Book Is For If you are a Scala programmer with no prior knowledge about concurrent programming, or seeking to broaden your existing knowledge about concurrency, this book is for you. Basic knowledge of the Scala programming language will be helpful. Also if you have a solid knowledge in another programming language, such as Java, you should find this book easily accessible. What You Will Learn Get to grips with the fundamentals of concurrent programming on modern multiprocessor systems Build high-performance concurrent systems from simple, low-level concurrency primitives Express asynchrony in concurrent computations with futures and promises Seamlessly accelerate sequential programs by using data-parallel collections Design safe, scalable, and easy-to-comprehend in-memory transactional data models Transparently create distributed applications that scale across multiple machines Integrate different concurrency frameworks together in large applications Develop and implement scalable and easy-to-understand concurrent applications in Scala 2.12 In Detail Scala is a modern, multiparadigm programming language designed to express common programming patterns in a concise, elegant, and type-safe way. Scala smoothly integrates the features of object-oriented and functional

languages. In this second edition, you will find updated coverage of the Scala 2.12 platform. The Scala 2.12 series targets Java 8 and requires it for execution. The book starts by introducing you to the foundations of concurrent programming on the JVM, outlining the basics of the Java Memory Model, and then shows some of the classic building blocks of concurrency, such as the atomic variables, thread pools, and concurrent data structures, along with the caveats of traditional concurrency. The book then walks you through different high-level concurrency abstractions, each tailored toward a specific class of programming tasks, while touching on the latest advancements of async programming capabilities of Scala. It also covers some useful patterns and idioms to use with the techniques described. Finally, the book presents an overview of when to use which concurrency library and demonstrates how they all work together, and then presents new exciting approaches to building concurrent and distributed systems. Style and approach The book provides a step-by-step introduction to concurrent programming. It focuses on easy-to-understand examples that are pragmatic and applicable to real-world applications. Different topics are approached in a bottom-up fashion, gradually going from the simplest foundations to the most advanced features.

Concurrency in .NET Pearson Education

This book constitutes the refereed proceedings of the 18th International Conference on Principles of Distributed Systems, OPODIS 2014, Cortina d'Ampezzo, Italy, in December 2014. The 32 papers presented together with two invited talks were carefully reviewed and selected from 98 submissions. The papers are organized in topical sections on consistency; distributed graph algorithms; fault tolerance; models; radio networks; robots; self-stabilization; shared data structures; shared memory; synchronization and universal construction.

Database Systems for Advanced Applications Springer Nature

A definitive guide to mastering and implementing concurrency patterns in your applications Key FeaturesBuild scalable apps with patterns in multithreading, synchronization, and functional programmingExplore the parallel programming and multithreading techniques to make the code run fasterEfficiently use the techniques outlined to build reliable applicationsBook Description Selecting the correct concurrency architecture has a significant impact on the design and performance of your applications. This book explains how to leverage the different characteristics of parallel architecture to make your code faster and more efficient. To start with, you'll understand the basic concurrency concepts and explore patterns around explicit locking, lock free programming, futures & actors. Then, you'll get insights into different concurrency models and parallel algorithms and put them to practice in different scenarios to realize your application's true potential. We'll take you through multithreading design patterns, such as master, slave, leader, follower, map-reduce, and monitor, also helping you to learn hands-on coding using these patterns. Once you've grasped all of this, you'll move on to solving problems using synchronizer patterns. You'll discover the rationale for these patterns in distributed & parallel applications, followed by studying how

future composition, immutability and the monadic flow help create more robust code. Toward the end of the book, you'll learn about the actor paradigm and actor patterns - the message passing concurrency paradigm. What you will learnExplore parallel architecture Get acquainted with concurrency models Internalize design themes by implementing multithreading patterns Get insights into concurrent design patterns Discover design principles behind many java threading abstractions Work with functional concurrency patternsWho this book is for This is a must-have guide for developers who want to learn patterns to build scalable and high-performing apps. It’s assumed that you already have a decent level of programming knowledge.

Web Information Systems Engineering – WISE 2018 Springer

The Handbook of Data Structures and Applications was first published over a decade ago. This second edition aims to update the first by focusing on areas of research in data structures that have seen significant progress. While the discipline of data structures has not matured as rapidly as other areas of computer science, the book aims to update those areas that have seen advances. Retaining the seven-part structure of the first edition, the handbook begins with a review of introductory material, followed by a discussion of well-known classes of data structures, Priority Queues, Dictionary Structures, and Multidimensional structures. The editors next analyze miscellaneous data structures, which are well-known structures that elude easy classification. The book then addresses mechanisms and tools that were developed to facilitate the use of data structures in real programs. It concludes with an examination of the applications of data structures. Four new chapters have been added on Bloom Filters, Binary Decision Diagrams, Data Structures for Cheminformatics, and Data Structures for Big Data Stores, and updates have been made to other chapters that appeared in the first edition. The Handbook is invaluable for suggesting new ideas for research in data structures, and for revealing application contexts in which they can be deployed. Practitioners devising algorithms will gain insight into organizing data, allowing them to solve algorithmic problems more efficiently.

CONCUR 2007 - Concurrency Theory Springer

Summary Concurrency in .NET teaches you how to build concurrent and scalable programs in .NET using the functional paradigm. This intermediate-level guide is aimed at developers, architects, and passionate computer programmers who are interested in writing code with improved speed and effectiveness by adopting a declarative and pain-free programming style. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the Technology Unlock the incredible performance built into your multi-processor machines. Concurrent applications run faster because they spread work across processor cores, performing several tasks at the same time. Modern tools and techniques on the .NET platform, including parallel LINQ, functional programming, asynchronous programming, and the Task Parallel Library, offer powerful alternatives to traditional thread-based concurrency. About the Book Concurrency in .NET teaches you to write code that delivers the speed you need for performance-

sensitive applications. Featuring examples in both C# and F#, this book guides you through concurrent and parallel designs that emphasize functional programming in theory and practice. You'll start with the foundations of concurrency and master essential techniques and design practices to optimize code running on modern multiprocessor systems. What's Inside The most important concurrency abstractions Employing the agent programming model Implementing real-time event-stream processing Executing unbounded asynchronous operations Best concurrent practices and patterns that apply to all platforms About the Reader For readers skilled with C# or F#. About the Book Riccardo Terrell is a seasoned software engineer and Microsoft MVP who is passionate about functional programming. He has over 20 years' experience delivering cost-effective technology solutions in a competitive business environment. Table of Contents PART 1 - Benefits of functional programming applicable to concurrent programs Functional concurrency foundations Functional programming techniques for concurrency Functional data structures and immutability PART 2 - How to approach the different parts of a concurrent program The basics of processing big data: data parallelism, part 1 PLINQ and MapReduce: data parallelism, part 2 Real-time event streams: functional reactive programming Task-based functional parallelism Task asynchronicity for the win Asynchronous functional programming in F# Functional combinators for fluent concurrent programming Applying reactive programming everywhere with agents Parallel workflow and agent programming with TPL Dataflow PART 3 - Modern patterns of concurrent programming applied Recipes and design patterns for successful concurrent programming Building a scalable mobile app with concurrent functional programming

The Garbage Collection Handbook "O'Reilly Media, Inc."

The 8th International Conference on Principles of Distributed Systems (OPODIS 2004) was held during December 15 –17, 2004 at Grenoble, France.

Handbook of Data Structures and Applications Springer Nature

This book constitutes the proceedings of the 16th International Conference on Parallel Computing Technologies, PaCT 2021, which was held during September 13-18, 2021. The conference was planned to take place in Kaliningrad, Russia, but changed to an online event due to the COVID-19 pandemic. The 24 full and 12 short papers included in this book were carefully reviewed and selected from 62 submissions. They were organized in topical sections as follows: parallel programming methods and tools; applications; memory-efficient data structures; experimental studies; job management; essential algorithms; computing services; and cellular automata.

Java Concurrency in Practice Apress

"This book is organized around three concepts fundamental to OS construction: virtualization (of CPU and memory), concurrency (locks and condition variables), and persistence (disks, RAIDS, and file systems"--Back cover.

Principles of Distributed Systems Springer

Beginning and experienced programmers will use this

comprehensive guide to persistent memory programming. You will understand how persistent memory brings together several new software/hardware requirements, and offers great promise for better performance and faster application startup times—a huge leap forward in byte-addressable capacity compared with current DRAM offerings. This revolutionary new technology gives applications significant performance and capacity improvements over existing technologies. It requires a new way of thinking and developing, which makes this highly disruptive to the IT/computing industry. The full spectrum of industry sectors that will benefit from this technology include, but are not limited to, in-memory and traditional databases, AI, analytics, HPC, virtualization, and big data. Programming Persistent Memory describes the technology and why it is exciting the industry. It covers the operating system and hardware requirements as well as how to create development environments using emulated or real persistent memory hardware. The book explains fundamental concepts; provides an introduction to persistent memory programming APIs for C, C++, JavaScript, and other languages; discusses RMDA with persistent memory; reviews security features; and presents many examples. Source code and examples that you can run on your own systems are included. What You'll Learn Understand what persistent memory is, what it does, and the value it brings to the industry Become familiar with the operating system and hardware requirements to use persistent memory Know the fundamentals of persistent memory programming: why it is different from current programming methods, and what developers need to keep in mind when programming for persistence Look at persistent memory application development by example using the Persistent Memory Development Kit (PMDK)Design and optimize data structures for persistent memoryStudy how real-world applications are modified to leverage persistent memoryUtilize the tools available for persistent memory programming, application performance profiling, and debugging Who This Book Is For C, C++, Java, and Python developers, but will also be useful to software, cloud, and hardware architects across a broad spectrum of sectors, including cloud service providers, independent software vendors, high performance compute, artificial intelligence, data analytics, big data, etc.

Structural Information and Communication Complexity Springer Science & Business Media

This book constitutes the refereed proceedings of the 17th International Conference on Principles of Distributed Systems, OPODIS 2013, held in Nice, France, in December 2013. The 19 papers presented together with two invited talks were carefully reviewed and selected from 41 submissions. The conference is an international forum for the exchange of state-of-the-art knowledge on distributed computing and systems. Papers were sought soliciting original research contributions to the theory, specification, design and implementation of distributed systems.

Networked Systems Springer

Published in 1996, Richard Jones's Garbage Collection was a milestone in the area of automatic memory management. The field has grown considerably since then, sparking a need for an updated look at the latest state-of-the-art developments. The Garbage

Collection Handbook: The Art of Automatic Memory Management brings together a wealth of knowledge gathered by automatic memory management researchers and developers over the past fifty years. The authors compare the most important approaches and state-of-the-art techniques in a single, accessible framework. The book addresses new challenges to garbage collection made by recent advances in hardware and software. It explores the consequences of these changes for designers and implementers of high performance garbage collectors. Along with simple and traditional algorithms, the book covers parallel, incremental, concurrent, and real-time garbage collection. Algorithms and concepts are often described with pseudocode and illustrations. The nearly universal adoption of garbage collection by modern programming languages makes a thorough understanding of this topic essential for any programmer. This authoritative handbook gives expert insight on how different collectors work as well as the various issues currently facing garbage collectors. Armed with this knowledge, programmers can confidently select and configure the many choices of garbage collectors. Web Resource The book's online bibliographic database at www.gchandbook.org includes over 2,500 garbage collection-related publications. Continually updated, it contains abstracts for some entries and URLs or DOIs for most of the electronically available ones. The database can be searched online or downloaded as BibTeX, PostScript, or PDF. E-book This edition enhances the print version with copious clickable links to algorithms, figures, original papers and definitions of technical terms. In addition, each index entry links back to where it was mentioned in the text, and each entry in the bibliography includes links back to where it was cited.

Operating Systems Springer

The three-volume set LNCS 12681-12683 constitutes the proceedings of the 26th International Conference on Database Systems for Advanced Applications, DASFAA 2021, held in Taipei, Taiwan, in April 2021. The total of 156 papers presented in this three-volume set was carefully reviewed and selected from 490 submissions. The topic areas for the selected papers include information retrieval, search and recommendation techniques; RDF, knowledge graphs, semantic web, and knowledge management; and spatial, temporal, sequence, and streaming data management, while the dominant keywords are network, recommendation, graph, learning, and model. These topic areas and keywords shed the light on the direction where the research in DASFAA is moving towards. Due to the Corona pandemic this event was held virtually.

Concurrent Patterns and Best Practices Springer

This book constitutes the refereed post-proceedings of the 4th International Conference on Networked Systems, NETYS 2016, held in Marrakech, Morocco, in May 2016. The 22 full papers and 11 short papers presented together with 19 poster abstracts were carefully reviewed and selected from 121 submissions.They report on best practices and novel algorithms, results and techniques on networked systems and cover topics such as multi-core architectures, concurrent and distributed algorithms, parallel/concurrent/distributed programming, distributed databases,

cloud systems, networks, security, and formal verification.

Principles of Distributed Systems Packt Publishing Ltd

This volume presents the refereed proceedings from the 14th International Symposium on Static Analysis. The papers address all aspects of static analysis, including abstract domains, abstract interpretation, abstract testing, compiler optimizations, control flow analysis, data flow analysis, model checking, program specialization, security analysis, theoretical analysis frameworks, type-based analysis, and verification systems.

The Art of Multiprocessor Programming, Revised Reprint Pragmatic Bookshelf

Your software needs to leverage multiple cores, handle thousands of users and terabytes of data, and continue working in the face of both hardware and software failure. Concurrency and parallelism are the keys, and Seven Concurrency Models in Seven Weeks equips you for this new world. See how emerging technologies such as actors and functional programming address issues with traditional threads and locks development. Learn how to exploit the parallelism in your computer's GPU and leverage clusters of machines with MapReduce and Stream Processing. And do it all with the confidence that comes from using tools that help you write crystal clear, high-quality code. This book will show you how to exploit different parallel architectures to improve your code's performance, scalability, and resilience. You'll learn about seven concurrency models: threads and locks, functional programming, separating identity and state, actors, sequential processes, data parallelism, and the lambda architecture. Learn about the perils of traditional threads and locks programming and how to overcome them through careful design and by working with the standard library. See how actors enable software running on geographically distributed computers to collaborate, handle failure, and create systems that stay up 24/7/365. Understand why shared mutable state is the enemy of robust concurrent code, and see how functional programming together with technologies such as Software Transactional Memory (STM) and automatic parallelism help you tame it. You'll learn about the untapped potential within every GPU and how GPGPU software can unleash it. You'll see how to use MapReduce to harness massive clusters to solve previously intractable problems, and how, in concert with Stream Processing, big data can be tamed. With an understanding of the strengths and weaknesses of each of the different models and hardware architectures, you'll be empowered to tackle any problem with confidence. What You Need: The example code can be compiled and executed on *nix, OS X, or Windows. Instructions on how to download the supporting build systems are given in each chapter.