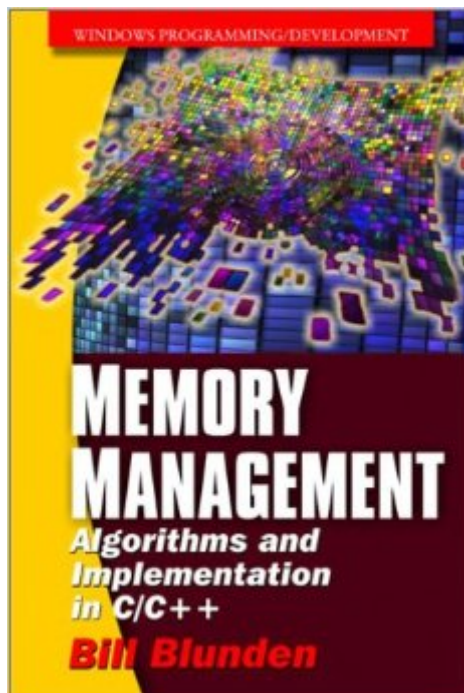# Memory Management Algorithms And Implementation In C/C++ (Windows Programming/Development)

Synopsis

Memory Management: Algorithms and Implementation in C/C++ presents several concrete implementations of garbage collection and explicit memory management algorithms. Every implementation is complemented by an in-depth presentation of theory, followed by benchmark tests, a complete listing of C/C++ source code, and a discussion of each implementationâ ™s trade-offs. Find out how memory is managed at the hardware level by the processor. Discover the ways in which different operating systems take advantage of processor facilities to provide memory services via the system call interface. Understand how development libraries and run-time systems build upon the operating system services to manage memory on behalf of user applications. Learn about five complete memory management subsystems that utilize both explicit and automatic collection algorithms.

Book Information

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Customer Reviews

This book, is one of the few computer books I have read from cover to cover - code listings are easy to scan/skip, and the book itself is not huge (however the cost seems fairly high for the size).This book is clearly written, and well researched. It is not for beginners.This book spends time on the hardware aspects of Memory management based on the Intel 386 and above architecture. Real Mode versus protected mode and how the processor design allows for memory protection in protected mode.This is then followed by a survey of Operating Systems, from DOS to Linux to

Windows - which is moving from the simple to the complex - and how the OS provides Memory Management services.Then the development of computer languages, and how they allow for memory management starting with COBOL and moving on to Object oriented C++ and Java Virtual Machines.Finally the last part of the book has a lot of code listings with very simplistic memory management and moving into slightly more complex algorithms for memory management for programs. The focus is on introducing multiple approaches and how to measure the real performance of each - some parts of this part of the book seemed like they were repeating the same text in making comments about the code.Overall, I liked the book. I read the Pentium Protected Mode architecture book last year, and it prepared me for this book.I have not done much assembly level x86 programming, but enough to understand what was being shown in the early examples.The book has a very good bibilography of sources for each chapter - six long chapters.

Memory allocation is a fascinating area, ripe in trade-offs and cutting-edge research. In this book, Bill Blunden manages to provide a pretty-good overview of the topic.It begins with an introduction of the lowest levels - the hardware, namely the CPU memory management unit. Then it goes on to explain how operating systems manage memory - segmentation, paging, virtual memory and what's between them. Next, memory is examined on the programming-language level - compiler-level and heap allocation mechanisms in Fortran, COBOL, Pascal, C and finally Java.The second part of the book is the practice: the author implements several manual memory management schemes (own implementations of malloc/free) in C++, and compares them in terms of performance and other characteristics (like memory fragmentation). Finally, he implements a couple of simple garbage collectors (reference-counting, and mark-sweep), and in the last chapter of the book also briefly mentions the important topic of sub-allocators (also known as "pools" or "arenas").Overall, I enjoyed the book. But I do have a few points of (constructive) criticism. First of all, the book is a bit too conversational for such a technical work. It feels like a collection of blog posts, and thus also lacks in depth. For example, the section on memory management of Windows is quite disappointing. As much as I can admire the author's attempt to show his exploration process armed by various tracing and monitoring tools, much of this information is well known and has been described. Instead, I would expect a more thorough presentation of the topic.The other problem is the C++ code. C++ code in books is a pet peeve of mine - for some reason it tends to be exceptionally bad in most of them, and this book is no exception.

Memory Management Algorithms And Implementation In C/C++ (Windows

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