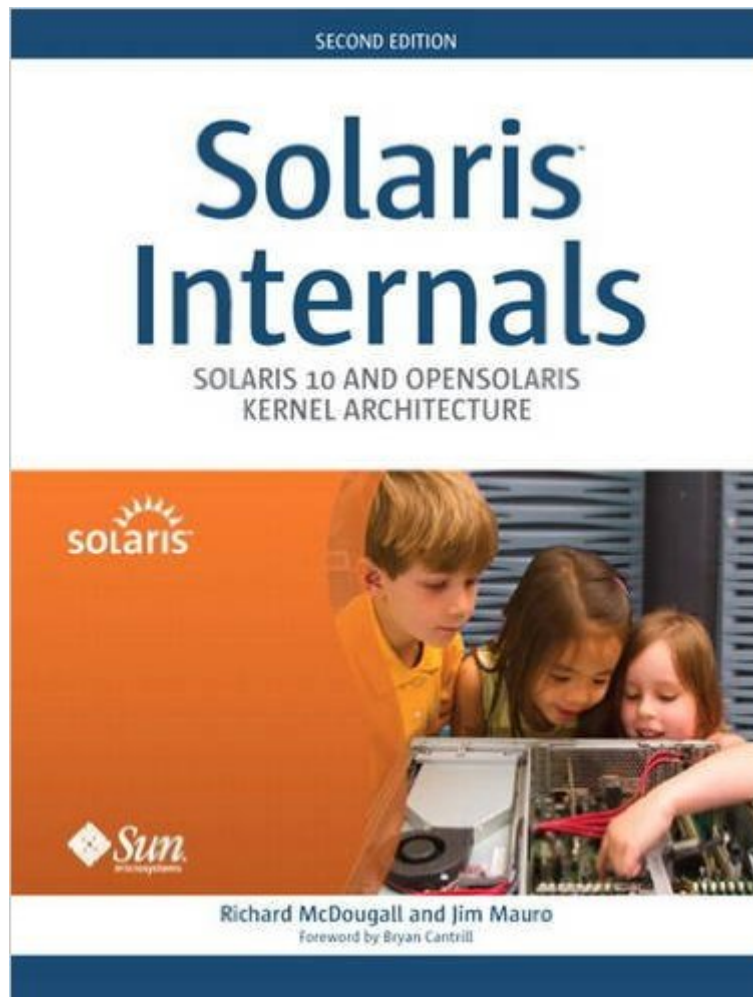


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# Solaris Internals: Solaris 10 And OpenSolaris Kernel Architecture (paperback) (2nd Edition)



## Synopsis

"The Solaris<sup>®</sup> Internals volumes are simply the best and most comprehensive treatment of the Solaris (and OpenSolaris) Operating Environment. Any person using Solaris--in any capacity--would be remiss not to include these two new volumes in their personal library. With advanced observability tools in Solaris (like DTrace), you will more often find yourself in what was previously uncharted territory. Solaris<sup>®</sup> Internals, Second Edition, provides us a fantastic means to be able to quickly understand these systems and further explore the Solaris architecture--especially when coupled with OpenSolaris source availability." --Jarod Jenson, chief systems architect, Aegis

"The Solaris<sup>®</sup> Internals volumes by Jim Mauro and Richard McDougall must be on your bookshelf if you are interested in in-depth knowledge of Solaris operating system internals and architecture. As a senior Unix engineer for many years, I found the first edition of Solaris<sup>®</sup> Internals the only fully comprehensive source for kernel developers, systems programmers, and systems administrators. The new second edition, with the companion performance and debugging book, is an indispensable reference set, containing many useful and practical explanations of Solaris and its underlying subsystems, including tools and methods for observing and analyzing any system running Solaris 10 or OpenSolaris." --Marc Strahl, senior UNIX engineer

Solaris<sup>®</sup> Internals, Second Edition, describes the algorithms and data structures of all the major subsystems in the Solaris 10 and OpenSolaris kernels. The text has been extensively revised since the first edition, with more than 600 pages of new material. Integrated Solaris tools and utilities, including DTrace, MDB, kstat, and the process tools, are used throughout to illustrate how the reader can observe the Solaris kernel in action. The companion volume, Solaris<sup>®</sup> Performance and Tools, extends the examples contained here, and expands the scope to performance and behavior analysis. Coverage includes: Virtual and physical memory Processes, threads, and scheduling File system framework and UFS implementation Networking: TCP/IP implementation Resource management facilities and zones

The Solaris<sup>®</sup> Internals volumes make a superb reference for anyone using Solaris 10 and OpenSolaris.

## Book Information

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## Customer Reviews

This book is actually just one of a two volume set - "Solaris Internals" for developers, and "Solaris Performance and Tools" for system administrators. I will speak of the second edition of "Solaris Internals", since I am not a system administrator by trade. "Solaris Internals" is the badly needed update for the only book that I know of that contains information on how Solaris implements functions behind the application programming interfaces. This information will be most helpful to application developers, device driver and kernel module developers, and advanced system administrators that are responsible for performance tuning and capacity planning. The book reads like a combination computer architecture and operating systems manual, and though it can be a bit dry at times, it was meant to be a reference book that professionals can go to for the details. In that sense, the first edition never failed me. In fact, if you are not familiar with the concepts of computer architecture and operating systems theory in general, this book will probably be over your head. From perusing the second edition, the format seems to be very much the same in the second edition, just with expanded material reflecting the additional features of Solaris 10. Also, if you are into Solaris systems programming as I am, another essential volume is "Solaris Systems Programming". That book is also very dry reading, but it has what you need to know in order to write code with system calls to the Solaris operating system. I show the table of contents below:

Part One: Introduction to Solaris Internals  
Chapter 1 -- Introduction  
Part Two: The Process Model  
Chapter 2 -- The Solaris Process Model  
Chapter 3 -- Scheduling Classes and the Dispatcher  
Chapter 4 -- Interprocess Communication  
Chapter 5 -- Process Rights Management  
Part Three: Resource Management  
Chapter 6 -- Zones  
Chapter 7 -- Projects, Tasks, and Resource Controls  
Part Four: Memory  
Chapter 8 -- Introduction to Solaris Memory  
Chapter 9 -- Virtual Memory  
Chapter 10 -- Physical Memory  
Chapter 11 -- Kernel Memory  
Chapter 12 -- Hardware Address Translation  
Chapter 13 -- Working with Multiple Page Sizes in Solaris  
Part Five: File Systems  
Chapter 14 -- File System Framework  
Chapter 15 -- The UFS File System  
Part Six: Platform Specifics  
Chapter 16 -- Support for

NUMA and CMT Hardware Chapter 17 -- Locking and Synchronization Part Seven:

Networking Chapter 18 -- The Solaris Network Stack Part Eight: Kernel Services Chapter 19 -- Clocks and Timers Chapter 20 -- Task Queues Chapter 21 -- kmdb Implementation

Well written and detailed. If you wish or need to know about the internals of Solaris this book is the source. This is a second edition and covers 10 and updates information on 8 and 9. The first edition covered 2.5.1, 2.6, and 7. I liked the first edition and waited for this edition based on the books/authors web site and have not be disappointed. Highly recommended, a reasonable background in OS theory is helpful with the type of material covered here - but not required - it will aid in understanding however. Recommended more general OS books would include "Operating System Concepts" by A. Silberschutz, J. Peterson, P. Galvin, "Operating Systems" by A. Tanenbaum, A. Woodhull, and "Unix Internals" by Uresh Vahalia among others.

Do you want to know how the Solaris kernel works? This is the book for you! If you've read any of the other titles by these authors you'll know how clear and succinctly written this book is. The book is not your normal 2nd edition "nip and tuck", it's a rewrite! One of the things I really like about this book is that it describes the internal theory and implementation of many kernel subsystems, but is not a code walk through or reiteration of other books / manuals. The book covers many of the new and recent features of Solaris, so it's also valuable for long time Solaris engineers that need to keep updated. People that are new to UNIX internals will also like this book as it starts with the assumption of some UNIX principles (but not too much), and takes you a \*lot\* further. There are pointers to other material for the truly adventurous, and small examples with sample output that keep the subject material relevant and enable to reader to make the connection between the theory and their system. Very highly recommended!

Mate this volume with "Solaris Performance and Tools", grab a few dumps and you will rule the Solaris universe. Only one thing could be better - the close proximity and availability of the previous Solaris Internals book, as the depth of discussion and explanatory diagrams are occasionally a bit better in the earlier book even though it covers only release 7 through 9. System programmers really must have this book. If you want to get the best from you machines you really must understand how DTRACE can make your life streets better than it is and that requires this book, eventually. Recommended. Resources: Solaris Performance and Tools: DTrace and MDB Techniques for Solaris 10 and OpenSolaris (Mauro, McDougall, Gregg 2006) Solaris Internals: Core

Kernel Architecture(Mauro, McDougall 2001)

This book should be in the library of any serious Solaris administrator. It is not a book for beginners, but it is well-organized and well-explained. The authors went to a great deal of trouble to clean up the parts of the original edition that were not as easily understood, and their effort shows. The examples are clear and well-explained, and the information is indexed and cross-referenced in a way that makes it easy to follow threads across chapters. The authors of this book have been extraordinarily generous with their time and energy. Jim Mauro was very encouraging and helpful in explaining topics which found their way onto my web site and into my book. The entire community owes these gentlemen a debt of gratitude for their professionalism and their generosity. Scott Cromar

Author: Solaris Troubleshooting Handbook

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