Managing
the New Enterprise

Harris Kern • Randy Johnson
Michael W. Hawkins • Andrew Law
with William Kennedy

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The Proof, Not the Hype

Harris Kern, Randy Johnson, Michael Hawkins, and Andrew Law
with William Kennedy

SunSoft Press
A Prentice Hall Title

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Dedication

We dedicate this book to two close friends and associates: to Karin Ellison, Manager, SunSoft Press, without her keen guidance and support and without her relentless involvement, our first book, Rightsizing the New Enterprise: The Proof, Not the Hype, *wouldn't have been the huge success it is today; and to Paul Lawryk, Group Manager Market and Account Development, for backing us at Sun. Paul is a rare Marketing individual who truly understands the commercial enterprise.*

We also dedicate this book to the CEO and one of the co-founders of Sun Microsystems, Scott McNealy. He got us into this New Enterprise with his now infamous dictum: "No more mainframe MIPS!"

Foreword

This Really *Is* Proof, Not Hype!

I first met Harris Kern and Randy Johnson when they approached SunWorld Online magazine about publishing a feature story that described how Sun Microsystems transitioned their mainframe-only data center to incorporate mission-critical distributed UNIX systems to run Sun's multi-billion dollar worldwide enterprise.

Intrigued by their enthusiasm, I decided to have a closer look. I'll never forget my first visit and seeing Sun's empty "glass house"—the huge data center once used for Sun's mainframe-based operations. It reminded me of an abandoned gymnasium after a Saturday night sock hop. I also remember an empty side room where once, I was told, a procession of technicians used to wait patiently to fix problems and mount tapes. It was an unusual introduction to the New UNIX Enterprise—nothing to see, nothing "happening." Or so it appeared.

Later I attended a presentation Harris and Randy prepared for a dozen IT staff from a major drug company. This was my introduction to the now famous "Harris & Randy Show." It was exciting and informative. They just spent five bruising years figuring out how to run a large, serious, growing business on UNIX-based distributed client/server systems and now they were describing their experiences and telling others how to do it. Harris bounded around the room answering a wide range of questions from strategy to technical detail, from UNIX to MVS. Randy leaned against a wall and smiled as he calmly furnished supplemental information to that of his peripatetic partner.

Harris and Randy had an answer for every question, no matter how arcane or remote. But there was something more important than answers to lots of questions, and I believe everyone understood the significance of the real issues. These were not boy geniuses, these were real people doing the real thing—running Sun's business-critical applications on distributed UNIX systems. They didn't talk about a small prototype or some irrelevant research project. They

addressed relevant issues and provided insight into real experiences—some good, some bad. Sure, they made mistakes—they had the scars to prove it—but in the end they actually did it. This was a story worth telling.

These guys were describing unique experiences and transferring valuable knowledge to one small group at a time. I had to find a way to get these guys into wholesale. So I persuaded them to start a monthly column—The UNIX Enterprise—in our magazine. With help from editor William Kennedy, the column became one of our most successful—and controversial.

Like me, I'm sure you've been reading about the high cost of client/server computing. Distributed computing has many advantages, the pundits say, but saving money isn't one of them. You'll need to double your staff; your experienced staff will quit; and you'll lose control over systems management and security. If that isn't bad enough, you'll probably be fired before anyone reaps the benefits of your work.

For two years Harris and Randy have been telling our readers the exact opposite: Distributed client/server computing *is* more cost effective than mainframe-based computing. It *can* be centrally managed effectively without losing any of the benefits of distribution. The UNIX cowboys can learn mainframe disciplines and the mainframers can learn UNIX-based client/server computing. And your customers in the business units can be persuaded to follow centrally controlled distributed computing—and like it.

So who's right? That's a difficult question, but I do know one thing. While highly paid consultants and prototypers continue to struggle, Harris and Randy have successfully managed the transition of a large mainframe-based company with islands of UNIX computing to a tightly integrated distributed client/server-based company with dramatically enhanced efficiencies—smaller staff, frozen budget, and no new mainframes.

Harris and Randy and their staff bled—a lot. They tried it the wrong way many times before figuring out the right way while learning a lot of lessons along the way. Their column and first book *Rightsizing the New Enterprise* (which has been a great success!) and now this book bring those lessons to you.

Now I'd like to introduce two other gentlemen who are the world's foremost experts in their respective fields—the new co-authors of this book: Andrew Law and Michael Hawkins. As Harris and Randy travel around the world they have the opportunity to meet with the most outstanding people in the IT industry. In doing so they searched for the best systems management and network experts to contribute to the latest book. Andrew and Michael are definitely two of the best.

They found Andrew in their own backyard. Andrew, who was working as part of the key staff responsible for transitioning Sun to a distributed UNIX environment, is an outstanding systems management expert. His expertise in systems management tools, standards, and procedures and real-life experiences managing distributed systems are invaluable contributions to this book.

Harris found Michael living and working on a tropical island in Southeast Asia. Michael is a world-renowned network expert. He provides valuable insights based on real-life experiences implementing and managing large heterogeneous networks around the world—from the Middle East to North America and Europe and throughout Asia and the South Pacific.

As you read, keep reminding yourself that this isn't a "book of theory"; these guys walk the walk, and have the bloody feet to show for it. Folks, there's no going back. Mainframe-based systems won't get you into the next century in competitive shape. It's distributed, client/server computing—or nothing. Read this book. Keep it by your nightstand for inspiration. Hand out copies to your key people. You'll be glad you did.

— Michael McCarthy,
President and Publisher of
SunWorld Online

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We thank Dennis Horgan for providing the case study in Chapter Eleven and for believing in and implementing a true client/server, mission-critical production environment based on the standards, procedures, and disciplines we preach.

Thanks to Shannon Law for her support and patience because of the numerous hours that Andrew spent with the book instead of with her. And special thanks to Christine Kong for accompanying Shannon while her author husband was preoccupied with this book.

We also thank Linda Flores, Mathew Ricks, Debbie Bentz, Jim Heredia, Ruey-Chyi Wang, Pedro Lay, Jay Raman, Karen Chau, Terry Beyer, and Cheryl Wallace; Richard Webster for assisting us as he did with our first book; Karen Chau, for her work on Change Control; Mary Jimenez and Rich Stehn for their work on processes.

A very special thanks to our friend Rachel Pong for believing in us and giving us the opportunity to implement our methodologies in a production environment.

And a special thanks to our close friends (Mark Gray, Mike Henriksen, and Steve Mertz) at Bell Plaza Chiropractic (Sunnyvale, California) for keeping our bodies together so we could stay focused during this ordeal.

A very special thanks to the Sun Sales and Marketing organizations throughout the world for supporting us and our first book.

Preface

In our first book, *Rightsizing the New Enterprise*, we presented our real-world experiences—the proof, not the hype—transitioning Sun Microsystems' corporate production-computing systems from a central mainframe to a distributed client/server environment. We talked about the new technologies and the role of Information Technology (IT) in this new computing paradigm. The goal is to "rightsize" the enterprise; to get the right information to the right people to support business requirements.

In this book, *Managing the New Enterprise*, we expand on the themes of the first book, *Rightsizing the New Enterprise*, and discuss how to build and manage a heterogeneous client/server environment. We describe in detail the key technology support infrastructures, including networking, data centers, and system administration. We also explain how IT must change to manage the New Enterprise.

What is this New Enterprise? It's what businesses or corporations must do to survive in the 1990s. Businesses are changing and so must IT to meet the new business requirements. Global competition is becoming more intense, profit margins are falling. To remain competitive, the New Enterprise must diversify and focus on products and services that provide a competitive advantage, all this while reducing costs.

When we were "volunteered" to transition Sun's production systems to client/server distributed computing in late 1989, most of our issues dealt with the new technologies. We had to invent, develop, and implement new technologies to meet IT goals in the new environment. Our goal was to provide the same reliability, availability, and serviceability (RAS) that we delivered in our mainframe environment. If we didn't, our customers—the users—would blame you know what? That's right: the new technologies! Even at Sun, which was in the vanguard promoting the new computing paradigm for businesses.

In today's world, the tools and technologies that help IT build, implement, and deliver RAS-disciplined, mission-critical applications are now commercially available and mature. Managing the New Enterprise is no longer a technology

problem. It's all about change. It's a cultural issue. IT must change the way they do business to survive. And the key to success is to re-engineer IT. We had to re-engineer ourselves while re-engineering business practices to be successful and to survive. We had to deal with executives who were advising that we "blow up the glass house." They felt there was no longer a need for any centralized IT functions like a data center. We proved them wrong! How? Read this book and find out.

Who Should Read This Book

Managing the New Enterprise is intended for the chief information officer (CIO), vice president of IT, chief technologist, architects, and line managers within IT (applications developers, networking specialists, telecommunications professionals, and computer operators) who are facing the challenges of building and managing the New Enterprise. This book is a survival guide. It's about how you must change to be successful.

About the Authors

Harris Kern was Sun's data center and system administration manager in Milpitas, California. Mr. Kern joined Sun in August 1988 as the technical support manager responsible for establishing and supporting a mainframe production environment. From 1990 to 1992, he implemented the tools, processes, and procedures to support Sun's first 24-hour, 7-day-per-week UNIX production environment for mission-critical applications. Without any new headcount he successfully transitioned his mainframe organization to support UNIX while maintaining their legacy environment.

Between 1984 and 1988, Mr. Kern worked at Fujitsu as the manager of computer systems, responsible for worldwide data communications and the HP data center. While at Fujitsu, he developed, documented, and implemented systems, standards, procedures, and an organizational structure encompassing all systems operations. He also established performance guidelines, measurement tools, and other management controls to ensure optimal service and support. Prior to Fujitsu, Mr. Kern spent ten years at GTE Inc. as a senior systems programmer and technical support manager.

Randy Johnson is a full-time rightsizing consultant (President of R&H Associates, Inc.). Prior to this, he held two key positions in Sun Microsystems' IT department. During the first two years, Mr. Johnson was responsible for

implementing Sun's wide area network. Later, he took over management of Sun's Corporate Data Center and was responsible for integrating client/server operations with the existing mainframe operational standards.

Before joining Sun, Mr. Johnson held various positions related to networking and data center management in mainframe environments. At National Semiconductor Corp. he was director of their worldwide SNA network. Prior to National, he was director of computer operations at Braniff Airlines. Mr. Johnson also worked at Federal Express Corporation, where he was part of the team that implemented their package tracking system. Overall, Mr. Johnson has more than 25 years of experience in the high-tech industry.

Michael Hawkins has been designing, implementing, and managing networks for more than 15 years, serving large companies in the oil and financial sectors. He was an engineer at NCR in 1978 and a customer engineer at IBM from 1979 to 1980. In 1980 he joined the Distributed Processing Division at the Arabian American Oil Company in Saudi Arabia, where he was involved with a large international SNA network for five years. He joined the Asian Development Bank in Manila, Philippines in 1984 where he is presently a senior computer systems specialist and head of technical planning and security. He is also an advisor to Network Research International, Inc. and Internetworking Institute, Inc., which provide network consulting services and seminars to corporations in the Asian region. His expertise includes large, multivendor, multiprotocol networks, SNA integration, network management, security, and e-mail integration. He earned a B.S. degree in Electrical Engineering and Computer Science from the University of California, Berkeley; an M.S. degree in Computer Science from Ateneo de Manila University; and an M.A. degree in Economics from the University of Oklahoma.

Andrew Law was an advisory systems programmer at Sun Microsystems' Milpitas Data Center. He spearheaded the development of a client/server Production Acceptance process to support mission-critical production applications, developed and implemented a tape management system for backup and restore, systems monitoring scripts, and many tools and standards to manage production systems. He is a pioneer in the evaluation of software and hardware products to support network and system management processes.

From 1983 to 1987 Mr. Law was a software engineer for Boole and Babbage and Syntelligence, building performance management software and expert systems. At Olivetti AI Center, he was responsible for porting an expert system to multiple platforms and transitioned himself to become a systems administrator. He supported 2 servers and 25 workstations at SRI International AI Center in 1989 and joined Sun in 1990. At Sun his group was responsible for supporting 250

mission-critical production servers on 9 subnets. Mr. Law holds a Bachelor's degree in Computer Science from University of California, Berkeley, and has a Master's degree in Statistics from California State University, Hayward.

William Kennedy, Ph.D., has more than 15 years experience in software development and computer publishing. He is a founder and current president of ActivMedia, Inc., a market research and new media development firm specializing in UNIX and Internet-related marketing and support. Prior to forming the new company, Dr. Kennedy was senior editor in charge of features and columns for *Advanced Systems* (formerly *SunWorld*) Magazine, which covered UNIX and related applications and technologies for the New Enterprise. Dr. Kennedy also served as editor-in-chief for several other magazines owned by International Data Group, including *inCider* and *MacComputing*. His Ph.D. was conferred in 1980 by the Department of Biochemistry and Biophysics at Loyola University of Chicago.

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