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by Peter Salus

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the bookworm

by Peter H. Salus

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There really are a lot of goodies this month. In fact, there are so many that I may end up being briefer than usual. We appealed for volunteer reviewers in the last issue. Come on! Tell me your interest(s) and I'll try you out.

Networking

I've now been using the ARPANET/Bitnet/Internet for about 25 years. I'm continually amazed by the ubiquity of both addresses and URLs. The growth from the four sites of December 1969 to the well over 100 million of December 2000 is breathtaking. So is my expectation that the Net is truly pervasive.

Elsewhere in this issue you'll see my thoughts on COOTS 6. But it's notable that one of the things central to Stu Feldman's keynote is mobility, what I used to call "location-resistant computing."

Charles Perkins has put together a really good anthology of important papers on mobility. *Ad Hoc Networking* is bound to become vital as we move toward the IP-on-everything world envisaged by Vint Cerf years ago and now coming into reality. While the military uses (Freebersyser and Leiner, pp. 29–51) are the most obvious, as each of us travels more and wants to access information wherever we are, downloading a road map or a theater schedule, finding out a sports statistic or a Supreme Court dictum, the formation of transient networks becomes vital.

I don't have the time or space to itemize the contents, but I was particularly taken by Perkins and Bhagwat (pp. 53–74) on DSDV; Johnson, Maltz, and Brock (pp. 139–172) on Dynamic Source Routing; and Toh and Vassilion on "The Effects of Beaconing on the Battery Life of Ad Hoc Mobile Computers" (pp. 299-321).

This is a very impressive set of papers.

In his keynote, Feldman mentioned Bluetooth. In his introduction, Perkins does, too. So it was with pleasure that I turned to Miller and Bisdikian.

Bluetooth Revealed is one of under a half dozen books on Ericsson's wireless specification. It's a relatively easy read and contains a useful bibliography.

Some of the largest networks in the world (e.g., Yahoo! and Hotmail) run on FreeBSD. Mittelstaedt has made the job of replicating those users a lot easier. The step-by-step is well done; the CD contains FreeBSD 4.2, XFree86 3.3.6, and hundreds of third-party packages.

Stein has modeled his networking book on Rich Stevens' exposition of TCP/IP. It's another major piece of work. If you're a Perl programmer involved with networking you will need to have this. I don't know where Stein gets the time or energy to produce good books as he does.

Internals

I enjoy reading internals books. Bach and the 4.3 and 4.4 volumes occupy a prominent place on my shelves. So does Vahalia. Now, along comes a volume by Mauro and McDougall that can be put with the other four.

The volume takes us through the kernel, but I thought the treatment of the algorithms and data structures was really fine. There's a useful bibliography and the index is good enough to enable you to employ the book as a reference.

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3-D Graphics

It took several thousand years for artists to discover ways to represent perspective and distance on a two-dimensional wall, canvas, board, or writing surface. Over the past 30 years, ways of representing space on a flat screen have increasingly occupied our time. (How I recall those SIGGRAPHs with hundreds of screens showing ray-tracing!)

About two years ago, the first version of Blender was released on the Internet by Tom Roosendael. It has been revised and improved since then, as have so many other open-source tools. Wartmann has now provided us with the first English introduction. Blender is useful for both the Web and for video, and Wartmann has written several excellent tutorials. The CD-ROM contains Blender 1.8 for Linux, FreeBSD, IRIX, Solaris, BeOS, and something called Windows.

Resurrections

By and large, I don't review second editions. This month I'm making an exception.

Kara Pritchard's Linux book is far more than an exam cram course: it is really a superb introduction to RedHat Linux. It has been thoroughly updated, and better still, it's shorter than the first edition.

Book Reviewers Needed

;login: (more specifically, Peter Salus) is looking for reviewers for books that deserve greater coverage than can be afforded within the Bookworm format. If you are interested, contact *<peter@matrix.net>*; feel free to suggest what topics you are interested in, and which book or books you might like to review.

DESIGNING STORAGE AREA NETWORKS
TOM CLARK

REVIEWED BY STEVE REAMES

Anyone who has been watching the information technology industry has noticed the increasing levels of excitement about Storage Area Networks or SANs. Marketing hype aside, SANs can provide improved reliability, ease of scalability, and simplified management of storage resources in large IT operations.

SANs have grown out of the open systems client/server world where servers running different operating systems communicate with multiple clients. LAN technologies – such as the ubiquitous Ethernet – were developed to enable individual computers to communicate with any of the servers. Most servers have their own private bank of disk drives and one or more tape drives to support the mass storage needs of their users. SANs place a network between the server and the storage, allowing multiple servers to access the same bank of disk or tape drives. Fibre Channel networks, with a data rate of 100MBps, are the current interconnect technology of choice.

Although Fibre Channel has been a standard since 1995, both Fibre Channel and SANs have remained in relative obscurity until the last two years. With the proliferation of SANs in enterprise network facilities, there is a need for books that explain the intricacies of SANs and Fibre Channel networking. Tom Clark's new book is a limited introduction to that world.

This small book, 200 pages long and 1/2-inch thick, is clearly intended to be an introductory text. The first three chapters are actually quite good and provide straightforward explanations of what can be a complex technology. Chapter 4 starts well but quickly becomes bogged down in the details of loop address negotiation in Fibre Channel Arbitrated Loops. Although this information is good for the technologist, it is a bit too much for a first exposure.

Subsequent chapters change to an erudite style of writing more suited to college textbooks or IEEE transactions. The information is there, but well-hidden in its abstraction. Paragraphs after paragraphs seem to go by without anything being said. Chapter 5, "Fibre Channel Products," is an encyclopedic-like descriptive alphabetical listing of hubs, switches, fabric modules, and other devices. Each product is described adequately, but the relationship between them remains unclear, almost as if each section was written by a different person.

The diagrams are sparse and poorly done. Standard clip-art symbols are used throughout, though this is not a weakness in itself. The problem is that the same graphic is often used to represent a hub, switch, fabric module, or Ethernet hub, and the item is often unlabeled. Diagrams that appear later in the book intermix all these items with Fibre Channel and Ethernet cables, but the connections remain undifferentiated. Using a different line weight, dashes, or even shades of gray would help immensely in figuring out which lines are Fibre Channel and which are Ethernet (a pretty important difference, in my opinion). One diagram in Chapter 5 purports to illustrate Raid mode 1+0 when in actuality it is only showing Raid mode 1.

Unfortunately, there are not many books on the market for Fibre Channel or SANs. If you have need for a brief introduction to SANs, then this book alone can provide a quick overview of the terrain, though I would stop reading at the end of Chapter 3. But if Fibre Channel and SANs are becoming an important part of your operation, I would suggest looking at some of the other more recent publications.

book reviews

PC HARDWARE IN A NUTSHELL

ROBERT BRUCE THOMPSON AND BARBARA
FRITCHMAN THOMPSON

REVIEWED BY RIK FARROW

I have sat in on PC-building BoFs at USENIX conferences and listened to some of my friends state they positively will not build or upgrade their own PCs. I actually built my first computer by soldering connectors to the motherboard and other S-100 bus card slots, a computer that not only worked, but one that I was able to sell several years later after adding a hard disk to it. So the idea of assembling a PC from parts really appealed to me.

The reality is that the naysayers are *almost* correct. Building your PC is difficult, because not only are the possibilities endless, so are the configuration problems. This is where *PC Hardware in a Nutshell* comes in.

The Thompsons have their own Web site, which includes updates to the material in the book: <*http://www.hardwareguys.com/*>. One of the things I noticed in the book was most of the emphasis is on building PCs for various flavors of Windows, so if you want help building a system that will work specifically with Linux or a BSD-variant, you are better off visiting VA Linux or BSDi, as both sites sell systems customized to support these UNIX versions.

Where I needed the most help understanding PC hardware, this book does a good job. And that is in the area of memory, motherboards, and processors. For example, you can only use certain processors with certain motherboards for a couple of reasons: the physical connections between the processor and the motherboard (Slot 1, Slot A, Socket 1, etc.) and the various support chips for that processor, such as the frontside bus, have to match. I didn't realize that I couldn't just stick in a faster Pentium III

processor, reboot, and have it run at a higher clock rate. Nope, you have to jigger your motherboard with numbers and/or BIOS settings to provide the correct clock rate (usually some fraction of the processor speed, such as one-third) before your new CPU will clock faster.

I would have loved to see some illustrations of the various slots and sockets – this book has no pictures. But, then again, that is simply my own desire to see what they are talking about. In reality, you don't look at motherboards to decide which ones to buy – you buy them based on their specs, chipsets, processor support, slots for memory and cards, and most importantly, their reputations for running the operating system of your choice.

I really enjoy one of the authors' major points: it is better to spend more money on a faster disk controller or more memory than on a faster processor. Spending $600 instead of $60 for your processor will only double your performance – not a lot of bang for your buck when you are only planning on spending $1,500.

I recommend *PC Hardware in a Nutshell* with the caveat that it will take more than what you can get out of this book to learn how to build your own PCs. It is a useful reference, not a tutorial on what is a difficult subject. Or, to quote from the authors' preface, "This should really be called *PC Hardware in a Coconut Shell.*" A useful tome.