Book Reviews

Friedhelm Schmidt

The SCSI Bus and IDE Interface. Protocols, Applications and Programming

Addison–Wesley Publishing Company, Wokingham, England, 1995, pp. ix, 301, ISBN 0–201–42284–0; translated from the German edition *SCSI-Bus und IDE-Schittstelle*

Both SCSI (Small Computer System Interface) and IDE (Integrated Disk Electronics) are ANSI (American National Standard Institute) standard interfaces widely used in modern computers, covering the whole palette from simple PCs to workstations and mainframes. While the simpler IDE hard disk interface targets the lower end PCs, SCSI finds its application in interconnecting diverse parts of a computer system be they hard disks, CD-ROMs, tape drives, printers or the like. Because of their broad utilization the need arises for an adequate reference material clarifying the usually cryptic standard documents. Thus, this book represents a good choice which will help design engineers in their everyday work.

The book consists of 25 short chapters structured into three parts: an introduction, and those devoted to the respective interfaces. The book is complemented by 5 appendices, a glossary, an index, and the accompanying diskette with a SCSI monitor program.

The first part of the book includes three chapters with some basic information on the historical development of SCSI and IDE as well as a short review of competing interfaces. Some rudiments of computer organization is provided, too. An abstract model for peripheral interfaces is introduced which is subsequently used throughout the book.

In its 5 chapters the second part elaborates on the IDE interface. The physical interface proper, the IDE protocol and the model of the IDE disk drive with respective commands are given. The limits of IDE drives are listed and the sector addressing modes described.

The core of the book is Part III (17 chapters) which covers SCSI related material. After a background introduction on the evolution of the SCSI, bus specific topics are detailed. These include SCSI hardware, the bus protocol and commands. All the three versions (SCSI-1, SCSI-2 and SCSI-3) are included and the differences among them stressed. The connection of the standard peripheral devices is explained in a number of short dedicated chapters; along with conventional devices such as hard disks, tape drives, CD-ROMs and printers, also scanners, communication devices, optical and WORM drives and medium-changer devices are described. To supplement the hardware issues a chapter deals with specialized software drivers, as e.g. ASPI (Advanced SCSI Programming Interface). Part III ends with a description of a SCSI controller chip.

Being basically a manual, this is a very readable book. It explains all the issues relevant for IDE and SCSI interfacing, and addresses both design and application engineers and advanced users. In my opinion *The SCSI Bus and IDE Interface. Protocols, Applications and Programming* is a book to be kept within reach and as such it is to be recommended.

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Ian Theakston

NetWare LANs: Performance and Troubleshooting

Addison–Wesley Publishing Company Inc., 1995, pp. xiii, 381, ISBN 0–201–63175–X

Formerly director of strategy and technical monitor for Azlan, one of the largest and longest established UK Novell distributors, Ian Theakston later established his own network consultancy company. By his own words, in the past few years he was something of an evangelist for the cause of PC LANs. It is sad to know that this book is his last, for Ian died in an accident during the final preparation of its manuscript.

I have been dealing with NetWare for quite a long time, knowing it since version 1.0, and spent endless hours in troubleshooting and performance tuning. During this time I had the opportunity to leaf through numerous books written on various aspects of NetWare, most of them being simply restructured and recompiled NetWare manuals. Well, it is notorious that NetWare manuals, while thorough, are difficult to use for an average NetWare user, so this recompilations have certainly found their readers. It is also well known that you need a lot more than manuals to effectively tune and troubleshoot NetWare LANs, and that good literature in this field is very rare. Biased with this experience I took Theakston's book, thinking that I will find nothing but repeated explanations of NetWare commands and options: it turned to be one of the rare gems. Contrary to some other examples, this book is not just a collection of "tips and tricks for NetWare" The author developed a structured approach to performance tuning and troubleshooting which, although presented on NetWare LANs, could be applied more generally as well. He stressed the importance of network analysis and documenting, and proposed a structured "check-lists" for first level troubleshooting of NetWare and LANs in general. The coverage is also wider than NetWare itself (it covers NetWare/286, NetWare v3.1X and NetWare v4.X) and deals with LANs such as Ethernet and Token Ring, as well as the interaction with applications and other operating systems, respectively. I found a lot of inspirational moments and several real eye-openers in it. The book is an invaluable companion to all

LAN administrators, integrators, managers and everyone who is involved in day-to-day operation of LANs.

NetWare LANs: Performance and Troubleshooting is very well structured, consisting of 25 chapters, 8 appendices and a very good index. Alas, the book has an intrinsic flaw, one which is an inseparable companion to all books dealing with specific products of the market: at the moment of publishing it is already made partly obsolete by the quick development of new product versions. Obviously, the book did not cover some new features of NetWare 4.1, and there is no mention of Microsoft Windows 95. Although a great part of the book will still be interesting in the years to come, it is sheer loss for the NetWare community that Ian will not be able to prepare further editions and keep them up to date with the new developments.

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Philip Hunter

Network Operating Systems: Making the Right Choice

Addison–Wesley Publishing Company Inc., 1995 (First printed 1994), pp. x, 298, ISBN 0–201–62766–3

The author of the book, Philip Hunter, has a long experience in the field of information technology including different professional responsibilities such as systems analyst and medical statistician for IT companies, and later becoming an information technology journalist specialised in networking and telecommunications. In this latter role he has for the last 13 years regularly written for *Computer Weekly, Information Week* and *Datacom*. He is also author of *Local Area Networks: Making the Right Choices*.

Making choices, especially the right ones, requires a good deal of understanding of the underlying processes technology and insight into the state of the art. This is what the book is really delivering to the reader, this time in the area

of network operating systems (NOSs). In the manner of the seasoned journalist (*Quis? Quid? Quale? Quando? Quomodo? Cur?*) the author answered questions that readers should have asked themselves. These questions include the following ones: What is a network operating system and when do I need one? What are the main types of NOSs and how do they differ? Are there low-cost simple NOSs available for small LANs? How do I choose a suitable NOS for my systems? Can I have more than one NOS running on my network? How does the NOS provide the LAN with access to other networks and computer systems? What is the role of the NOS in network management? What are application programming interfaces (APIs) and how are they supported in the NOS? What is network computing and what is the role of the NOS in this? How is NOS likely to evolve? What should be more obvious than to make chapter titles out of these questions? Following such a scheme the author organized the book and made each chapter a thorough answer to its title. If you are asking yourself some of the above questions, or have the feeling that you should have asked yourself something about NOSs but never found the right questions, then read *Network Operating Systems: Making the Right Choice*. The book is doing very well in explaining the jargon that shrouds the field of network operating systems and networks proper. It is also very up-to-date in describing the state of the art in this area.

The book consists of 10 chapters. An additional chapter elaborates the case study of *Bass Group plc*, describing how issues raised in the book have been tackled by a major NOS user. There are also 11 appendices covering some side issues, all of which unfortunately seem to be too short and too long at the same time: too short to clarify the issue with enough detail and too long to waste space on such skin-deep coverage. Some annotated bibliography would be more gladly seen instead. Indeed, the book includes no bibliography at all. The index is well composed and very usable.

The book *Network Operating Systems: Making the Right Choice* by Philip Hunter should not be considered as a textbook on NOSs, and the author himself did not ever presume such a consideration. Rather, it is targeted to managers of small and middle-sized companies to help them make right choices while planning their future

corporate networks. In this role, in my opinion, it could prove very successful.

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C Program Design For Engineers

Addison–Wesley Publishing Company, Reading, Massachusetts, 1995, pp. xvii, 644, ISBN 0–201–59064–6.

The C language was originally designed as a programming language for the UNIX operating system. Over the years, however, the power and flexibility of C, together with the availability of high-quality compilers have made it almost the standard programming language for a wide variety of applications. This book is intended to be a textbook for a first course in programming for engineering majors. It assumes no prior knowledge of computers and programming. The book teaches a disciplined approach to solving problems and to applying well-known engineering methods to design C programms. The text introduces implementations of basic numerical and statistical methods commonly used by engineers. The examples also cover some problems taken from engineering disciplines, including space exploration, DNA mapping and image enhancement.

The usefulness of the book is enhanced by a number of self-check exercises at the end of each section and chapter. Each chapter ends with a set of programming projects. The book contains a wide variety of programming examples. Syntax and program style rules are outlined. Each chapter discusses common programming errors.

The introductory chapter is written for readers not familiar with computers and programming languages. The authors present a brief history of computing and describe the basic components of computers. They also outline the strategy for solving problems and reveal the steps required

to convert these solutions into executable computer programs.

Chapter 2 begins with a discussion on how to apply software development methods to solve programming problems. It introduces the C programming language, describing statements for performing computations and for getting input data and displaying results.

Data Types, Operators and Simple Functions takes a closer look at floating point, integer and character data types. It also describes standard library functions most often used in numerical problems and explains how a user can define simple functions of his own.

Follows a chapter on selection structures in which logical statements and branching statements (if and switch) are extensively dealt with. The next chapter introduces C control statements while and for, which enable rapid repetition of groups of commands.

Modular Programming introduces functions, analyzing both functions that return a single result and void functions. The chapter includes a section on scope of names and on recursive functions.

Chapter 7 gives a detailed presentation on arrays, including the use of individual array elements or whole array as input and output arguments. This chapter also deals with strings as a special case of one-dimensional arrays of characters. Follows a chapter on multidimensional arrays.

User-defined structure types are the topic of the ninth chapter — here a special attention is paid to structure data types as I/O parameters and functions returning some structure. Chapter 10 explores in depth the use of file input/output and compares text and binary files. *Programming in the Large* examines difficulties associated with the development of large software projects. The modularization of large projects is discussed, dealing with procedural and data abstraction, information hiding and code reusability.

Although the whole book contains a lot of examples involving computational methods, the concluding chapter *Introduction to Numerical Methods* focuses on some computational methods that are widely used in engineering applications.

This book is ideal for engineers — absolute beginners who have never programmed and who intend to start using the C language for developing their own applications. Compared to competitive introductory textbooks which usually include rather abstract examples, one of the obvious strengths of this book are the practical examples which will help an engineer to better understand the concepts of C. Another outstanding quality of the book is the instructive approach with exercises evenly distributed through the chapters.

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X Window System User's Guide

The X Window system became an ultimate choice for windowing on UNIX platforms, with implementations on personal computers as well. The book carrying the title *X Window System User's Guide* should be a useful guide for an X Windows end user. Unfortunately, the authors either chose a wrong title for the book, or simply didn't cover the subject well.

The book is constituted of eight chapters and two appendices. Appendix 1 is a glossary of terms, while Appendix 2 gives answers to Frequently Asked Questions.

Chapter 1 is an introductory chapter where the authors briefly examine the history of MIT's project Athena within which the X Window system was developed, and its various releases.

Chapter 2 gives an overview of various X Window System components. This chapter is, however, poorly organized and doesn't have a good balance with respect to the importance of particular components. Therefore, an unexperienced reader can't get a clear picture of how an X Window system works, and on the other side, the experienced user doesn't get any useful information. For example, the chapter begins with

explanations of very basic terms like icon, cursor and screen, while only few pages later the text becomes full of terms like BOOTP, RARP, XDMCP which are not properly explained. Instead of covering the X Window principles and basic functions, the chapter titled *X Window System architecture* only brings confusion to the reader.

Chapter 3 starts with a few sentences on the Open Look standard and continues with the explanation of startup and customization files for the Open Look window manager. Once again, the reader is confused by examples lacking a proper explanation. Furthermore, there is a duplicated example of the .openwin-menu configuration file in the same chapter. Chapter 4 is conceptually equal to Chapter 3, covering the MOTIF window manager, and showing the same obstacles as the previous chapter.

Chapter 5 is intended to cover X Window implementations on PCs and Macintoshes. Conceptually inappropriate, the chapter starts with an installation guide for the PC-Xview software product, which is definitely not interesting to the majority of readers, since the pertinent instructions can quite probably be found (if necessary at all) in the accompanying software manual. The same applies for the DESQview/X product coverage which comes as the following item in the book. As for Macintosh computers, the main topic is how to establish a connection for a Planer X session. In my opinion this procedure is irrelevant and certainly not very interesting for most of the readers. The authors persist with such an approach, unnecessarily dealing with details of particular software installation and usage, instead of giving an overview of concepts and comparison of available X products for personal computers, which would surely be more useful.

Chapter 6 should cover X terminal devices, but once again the authors make the same mistake as before, and present a specific procedure without proper descriptions and explanations, this time for the NCD X terminal configuration. This chapter definitely does *not* "provide detailed information on how to select and configure an X terminal" as the authors state in the summary section.

Chapter 7 is intended to cover the installation of X software for various UNIX platforms. It starts with *Installing OpenWindows V3.2 on a SUN Sparcstation under Solaris 2.2*. It is clear from the subtitle, that the authors once again concentrated onto very specific details. Following this is a section under the title *Getting to know your mouse*, while File Manager, Mailtool and Calendar Manager applications are explained in the subsequent sections. These explanations are very much like those appearing in SUN's documentation and, therefore, quite unnecessary. The rest of the chapter describes using and customizing of AIXwindows on IBM platforms. Some examples from the fourth chapter are, however, repeated.

The last chapter gives a brief explanation of some commonly used X Window commands and aplications (xclock, xinit, xdpyinfo, x11perf) and provides an account of the font system usage. To make the book more usable, this chapter should be extended on the account of previous chapters.

The book is intended for a wide range of X Window System end users. The authors however took too much care of details specific for a few commercial products. As a result, the book is not as useful as a user's guide should be. The hidden value of the book are the answers to Frequently Asked Questions (Appendix 2), picked from the Usenet newsgroup comp.windows.x. However, a serious book on X shouldn't let this be its only value.

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Alan Southerton

The Shell Hackers Guide to X and Motif
Custom Power Tools & Window Manager Tricks

John Wiley & Sons, Inc., New York, 1994, pp. xvii, 382, ISBN 0–471–597228 (book), ISBN 0–471–597236 (book/disk set).

This book is intended for those who want to learn how to effectively customize X Window

environments without attempting to force them-selves into programming in C or to learn some visual scripting language. As the author stated, his book is the result of his frustration with various UNIX desktop managers he worked with. As a Product Review Editor of *UNIX-World Magazine*, he has been dealing with various UNIX products developed for various platforms. Unfortunately, every platform has had a different desktop manager forcing him to spend many hours customizing his environment in an attempt to achieve the level of functionality one is used to. Finally, he decided to write his own tool, called Xmenus, for modifying menus, colors, fonts, mouse behaviour and other X and Motif resources and functionality, using bare shell scripts.

This book is much more than a description of Xmenus. It covers a great deal of X Window and Motif concepts, terms and functionality, which may be useful for different levels of users: from UNIX newbies familiar with basic UNIX commands only, to administrators and programmers who may find good recipes in it.

The book consists of ten chapters, five appendices and an index. In the introductory chapter the author gives a very clear description of some basic X terms like client, server, window manager etc. which often confuse the novice user. This chapter continues with a survey of UNIX variants and the history of X. Chapter 2 is devoted to starting an X session. The author discusses pros and cons for using xinit and xdm and gives some examples of startup scripts and resource files.

The following three chapters are concerned with X and Motif resources and Motif menu functions. Here the reader will learn how to display the resources loaded for some client, which can be very useful when there are no installed visual resource editors. An interesting sample script file is given for displaying the loaded resources and the filenames associated with them. In this part of the book the author also elaborates on resource setting precedence; since resource setting precedence usually happens to be quite confusing, the inclusion of this topic is a good choice. The various examples presented in this part of the book may be used as an interactive tutorial for setting some common X and Motif resources like window geometry, colors, fonts

or bitmaps. A quick reference manual for Motif menu functions is also given.

Chapter 6 is dedicated to Motif Menus. Here the author gives examples of .mwmrc files which are responsible for basic menu look appearing on the screen when clicking on the main window. In this chapter the reader can find a review and a short description of Motif functions categories as are sizing, movement, focus, colormap, management, execution, internal, menu and binding ones.

The rest of the book is about the look and the functionality of the author's Xmenu — a menu system intended to be a Swiss army knife to X desktop management (the author himself calls it "Motif Army knife" and my impression is that its purpose exactly fits this name).

In the appendices the reader can find more examples of useful scripts, a survey of Xterm escape sequences and a user guide for Xmenu.

In the plentitude of books covering X Window paradigms, toolkits, resources, programming and the like, *The Shell Hackers Guide to X and Motif* can find its place as an easy-to-understand tutorial for the novice X user and an interesting cookbook for advanced users, respectively. A lot of concise examples give one the opportunity to interactively try and see the results of many shell commands and scripts which he/she will probably find useful for incorporating in his/her own code. For those who want to effectively manage and customize their X windows environment this book is warmly recommended because of its well-written text (it does not contain the infinity of never described abbreviations so common in UNIX books) and many useful examples which are included on an accompanying disk.

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Digital Image Processing

Addison–Wesley Publishing Company, Reading, Massachusetts, 1992, pp. xvi, 716, ISBN 0–201–50803–6.

The book *Digital Image Processing* by Gonzalez and Woods, is based on *Digital Image Processing* written by Gonzalez and Wintz (1977) and its second edition published in 1987, is a third-generation book which contains 151 new sections, over 250 new figures and over 150 new references. It covers new topics such as neural networks, morphology, and knowledge-based image analysis systems.

A brief overview of the chapters is as follows. Chapter 1 deals with the components of image processing systems and describes image acquisition, storage and displaying.

Chapter 2 gives digital image fundaments: from elements of visual perception, through sampling and quantization to imaging geometry. The image transforms (DFT, FFT, Walsh, Hadamard, Haar and Hotelling) are described in Chapter 3.

Chapter 4 extensively treats image enhancement techniques (enhancement by point processing, spatial filtering, enhancement in frequency domain, color image processing).

Chapter 5 deals with techniques for image restoration.

Chapter 6 covers the topics of data compression: image compression models, error-free compression, lossy compression and image compression standards.

Chapters 7, 8 and 9 deal with techniques suitable for image analysis. Chapter 7 describes segmentation and contains material ranging from edge segmentation, adaptive thresholding, region-oriented segmentation to the use of object motion in segmentation. Representation schemes, boundary and regional descriptors and morphology are described in Chapter 8.

Chapter 9 is an entirely new one. It deals with recognition and interpretation and covers a broad range of recognition techniques: minimum-distance, correlation and Bayes recognition schemes, perceptrons and neural networks. The different knowledge representation schemes used for image interpretation are also described in this Chapter. The book contains two appendices. Appendix A contains Fortran subroutines for displaying gray-level images. Appendix B contains a set of coded images suitable for experimenting with the methods discussed in the text.

The book *Digital Image Processing* by Gonzalez and Woods can be recommended as a basic text for further study, practice and research in the field of image processing and understanding.

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