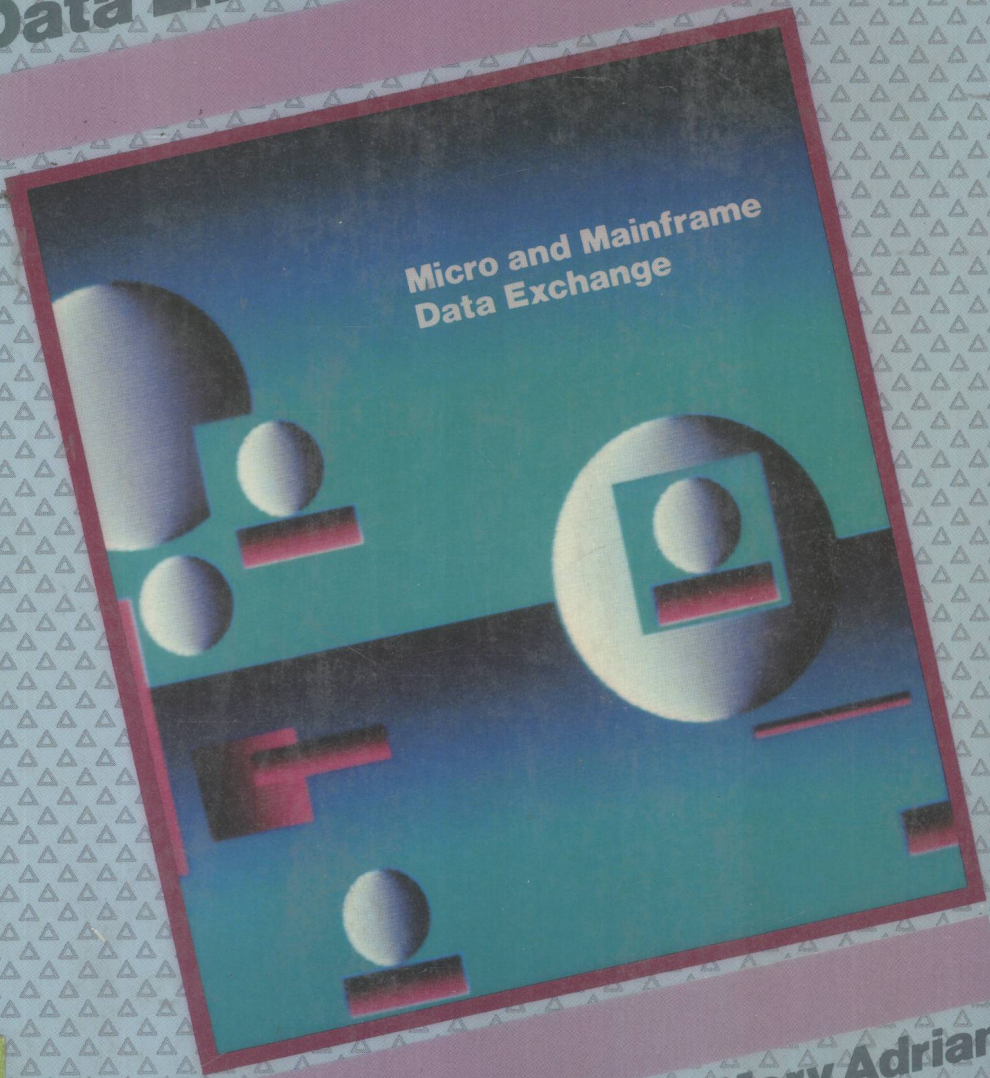
Computing That Works

# The Workstation Data Link

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# Dedication

To Frank da Cruz of Columbia University, who taught me more in three night classes than I had learned in the previous year. To Michael Camp of Tangram, Mussie Shore at Lotus, Yvon Leveille at Micro Tempus, and especially Roby Millstein at VM Personal Computing and my good friend Bill Thornton, I owe a profound debt for their time and enthusiasm. To Jack Armstrong of Cullinet and Dave Feldstein of Information Builders, whose vision and conceptual skills helped me to articulate my thoughts, I owe a surpassing debt.. To the New York Personal Computer User's Group, which has provided me with a platform and a forum for meeting and discussing issues with the leaders of the industry, and to the editor of their newsletter, Hy Bender, my gratitude for their faith and support. To Stephen Levin, grateful thanks for many hours of productive work together as computing professionals and valuable hours discussing the use of the language. To the good people of New Jersey Transit, on whose trains this book was largely written on a precariously perched laptop (and almost lost one frightening night but for the couretesy and attention of a diligent conductor), my thanks. To my parents, who stopped having the vaguest idea just what I did for a living years ago, thank you for the support and confidence you invested in me, and the belief in myself you nurtured. Finally, to my wife, Barbara, who has put up with a driven and determined husband who kept disappearing downstairs in the late evening, after the children were in bed, to pound away at the keyboard until he was too tired to do much except stagger up to sleep, thanks for your patience and understanding. Barbara, this book is for you

# Preface

The wealth of issues associated with what is often called "micro-to-mainframe" is daunting for the most technical of computer users. Imagine the perplexity of the novice, or of the manager who is more concerned with productivity and results than with technical specifications as he or she tries to reach a decision in this complex area.

The author has, at various times and on various systems, played all three of these roles, sometimes at the same time. This is precisely the difficulty in heterogeneous networking — many of us have achieved moderate, or even high, levels of technical competence in one or more environments, only to find that it simply is not enough.

In determining how to structure this book, then, we have tried to offer a number of perspectives. In Part One, we begin with a perspective on why the issues which follow are significant. Their role in the everyday business functioning of the modern corporation is discussed here, but equally important is an understanding of the context.

The business that seeks competitive advantage, then, is likely to look for new opportunities. For the less adventurous souls, those who believe that, as often as not, the pioneers may be identified by the arrows in their backs, there is benefit to be found simply in keeping aware of what those pioneers will be doing.

We move on to a discussion of the complete link, circa 1988, with some hints at what is likely to come. The set of functions that a link should have is discussed, along with occasional pointers to products that offer some of the functions noted.

As we go on to Chapter 3, we are beginning the most technical part of the book. A discussion of mainframe data architectures is presented in order to help familiarize both the manager and the PC technical specialist with some perspective on just how corporate data in a host-based environment typically is stored. The host-based components are the core of Part One; the business perspective in Chapter 1 and the fundamental model in Chapter 2 are largely for context.

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From data architectures, we move to Chapter 4 and mainframe communications, specifically, IBM's SNA. We cover the composition of messages at a descriptive level, rather than byte-by-byte. It is not critical to understand what each bit of a message header does, but highly useful to be aware that the addition, processing, and stripping of those headers is how SNA provides the requisite services to route, prioritize, and supply facilities to those messages' users.

In Chapter 5, we begin by considering the alternative network architecture prevailing throughout the non-IBM mainframe world — the Open Systems Interconnect Reference Model promulgated by the International Standards Organization. (This will fortunately be referred to simply as the OSI model subsequently.) In the same chapter, we move to a discussion of local area network technologies and protocols because there is significant overlap.

Chapter 6 bridges us into the PC environment with a look at data communications from the asynchronous side. We discuss some of the issues relating to telephone carriers, asynch protocols, and the like. This is as important as the SNA and OSI discussions in understanding the transport component of the link.

In Chapter 7 we turn to an examination of the link in more detail. Its place in the model and its importance to the business are further explored. We discuss where corporate data is found, unattended systems, the multiple source problem, and more.

In Chapter 8, we deal with the practical matters — how links are implemented, what the physical issues are, and so on. We talk about the options: 3270, RJE, synchronous, asynchronous, and what they all can mean to you.

A discussion of the workstation concept itself brings us to the thrid and last component of our model in Chapter 9. The presentation services required of the complete link are keyed on the services the workstation provides to its users. Accordingly, in Chapter 9 we discuss in some detail the analytical tools of both host and workstation environments, address issues of transparency and programmability, and tackle the fourth generation languages.

Chapter 10 is called A View From the Desk, and it is a turnabout on our earlier perspective. We hope that the mainframe-oriented reader will find some elucidation of the point of view taken by the micro user. The forbidding nature of the host environment is noted, as well as the more common elements of the business issues from the local side.

Like any technology, the data link products have their share of remarkable successes. Wedding technology to vision, and bringing

that vision to market successfully in a technical environment dominated by giants, is a substantial undertaking. To elucidate some of these problems, and to give some historical perspective on the state of the market today, we look at four of the more interesting products in the market.

The archetypal coax connectivity product is certainly the ubiquitous IRMA from DCA. Since information about this product is likely to be the most easily obtained of all, we have kept that to a minimum, providing instead a rare treat — a discussion of the real history involved, based on discussions with one of the engineers responsible for the first board. The meeting of opportunity and vision is clearly present here in Chapter 11, and the story is fascinating.

From the asynch communications market, we look at RELAY from VM Personal Computing, a product that emerged early and has continued to grow steadily both in technical accomplishment and market share. Chapter 12 looks at some of the purely business-related aspects of the product's history, including how marketing and sales were approached.

On the host side, there have been visionaries as well. From an early idea about the use of mainframe storage to today's vision of the mainframe itself as simply another component in the information network, Micro Tempus has pioneered software concepts. In Chapter 13 we trace some of that history as well as some of the technical aspects of the leading virtual disk technology. Today, IBM itself is eching their design with the SRPI approach to data management and movement.

The final product we consider may some day be the one historians look back on as the critical business decison for Lotus Development Corporation. With their early purchase of The Application Connection, Lotus gained a first foothold in the host data marketplace long before any of its micro-based rivals, a situation that continues to this day. We look in some depth at the architecture of T-A-C and its implementation, as well as providing some idea of its roots in the little consulting firm that created iLink.

In Chapter 15, we consider early 1988 developments involving Microsoft, Ashton-Tate, and others. No doubt, as we go to press, Lotus is announcing further elements of its strategy involving IBM itself and Gupta's SQLBase. The LU 6.2 marketplace is beginning to deliver on its early promise, with everyone from Novell to Apple announcing products, and IBM's Extended Edition still a question mark.

To wrap it up, then, we close with a look at the original micro-to-mainframe marketplace — the 3270 emulation boards. How is that faring as we move into a new era at the workstation? The answer may surprise you. We writers like to be at the cutting edge, of course, and it's no surprise that we like to talk about the newest and most exciting developments. But with good reason, the vendors of 3270 boards feel that they have years of good sales ahead of them. In Chapter 16, we talk about why that is so. It's going to be a fascinating year.

We follow the last chapter with a glossary of commonly used terms. There are a bewildering number of them, but this book will get you well on your way to mastering the Workstation Data Link.

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Part One

# Models and Mainframes

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