



微软编程圣典丛书（影印版）

Microsoft® Press



XML

解决方案（影印版）

[美] Jake Sturm 著

Developing
XML
Solutions

Enable seamless
business-to-business
data exchange with
XML, BizTalk™,
and **SOAP**

北京大学出版社

<http://cbs.pku.edu.cn>

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内 容 简 介

本书为在企业系统内使用 XML 访问、处理和交换数据提供了专业指导。本书内容全面,检验了最新的与 XML 相关的数据交换技术,并说明了 XML 如何与进行分布式计算的 Microsoft DNA 结构相适应;对 Microsoft Visual Basic 编程语言、Microsoft Visual Basic、VBScript 和 Microsoft JScript 的技术实例进行了探讨,以阐明如何为客户/服务器、n-tier 系统及其他方案建立专门的 XML 解决方案。

本书内容丰富,语言流畅,是 IT 从业者的一本很好的参考书。

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书 名: XML 解决方案 (影印版)

责任著作者: [美] Jake Sturm 著

标准书号: ISBN 7-900632-58-1 / TP · 43

出 版 者: 北京大学出版社

地 址: 北京市海淀区中关村北京大学校内 100871

网 址: <http://cbs.pku.edu.cn>

电 话: 出版部 62752015 发行部 62754140 62765127 编辑室 62765126

电 子 信 箱: zpup@pup.pku.edu.cn

排 版 者: 北京东方人华科技有限公司

印 刷 者: 中国科学院印刷厂

发 行 者: 北京大学出版社

经 销 者: 新华书店

787 毫米×1000 毫米 16 开本 27.25 印张 660.1 千字

2001 年 4 月第 1 版 2001 年 4 月第 1 次印刷

定 价: 68.00 元(含光盘)

出版前言

如果用一个成语来概括国内计算机图书市场的现状，当谓之“汗牛充栋”。然而，如果您是一位从事计算机应用系统开发或管理的中、高级专业人士，很可能发现这貌似种类齐全的计算机图书中，为您量身定做的并不多见。

依据多年从事计算机图书工作所积累的经验，以及与 IT 领域广泛而深入的接触所获取的信息，我们认识到，具有相当的专业深度和技术前沿性的图书，是计算机专业人员的迫切需要，当然，也是我们从事计算机图书工作、服务专业领域的一大着眼点。

基于这一点，2000 年元月，我们与微软出版社(Microsoft Press)达成合作协议，成立微软图书影印中心，独家代理微软出版社图书影印版在中国大陆的出版、发行，为 IT 业界提供及时的专业技术服务。选题和策划上的匠心独运，使得我们的影印书成为计算机图书中的标新立异者。这里，有四大特色值得读者朋友予以关注：

首先，这是微软出版社第一次授权在中国大陆影印、发行它的版权书。在选题上，可以说独辟蹊径。在内容上，立足技术广度和深度，系统推介微软产品。所有这些，都是目前国内一般计算机图书所无法比拟的。

其次，我们的理念是为国内计算机专业人员学习前沿性的微软技术提供服务。为此，我们不但与微软公司紧密协作与沟通，及时掌握微软最新技术动向，而且组织了精干的工作人员，倾力于微软影印书的出版和发行。

再者，微软影印书主要面向中、高级专业人员，印量有限。这类书的读者对象有较强的针对性，一般来说，包括 IT 决策人员，中、高级开发人员，以及中、高级系统管理人员。因而，我们将每套书的印数控制在 1000~2000 册之间。

最后，微软图书影印版几乎与原版书保持同步发行，最大限度地满足了国内读者跟踪微软最新技术的需求。软件升级越来越快，新软件令人目不暇接。作为技术载体之一的图书，只有迅速作出反应，把新软件介绍给读者，才能赢得他们的青睐。总之，兵贵神速，这是我们的目标。

正应验了前人的预言，21 世纪是一个信息时代。软件作为信息系统的神经，在我们生活的这个时代里发挥着举足轻重的作用，而微软公司和它推出的各种软件，更是令世人为之瞩目。我们将立足图书，继续并扩大与微软公司的合作，在中国信息产业的发展道路上留下自己的足迹。

出版者

2000 年 10 月

Acknowledgements

I would like to begin by recognizing the work of the two primary editors of this book: Denise Bankaitis and Julie Xiao. A book is created by a team consisting of the author and the editors, and my two editors have made this one of the best book teams I have worked with. Denise has reviewed the grammar, flow, and content of this book, and she has greatly improved the book's readability. Julie, the technical editor, has carefully checked the technical content of this book. Julie's job has been especially difficult due to the constantly changing W3C specifications, the new releases of products, and the lack of documentation on the most current XML technologies. Julie has consistently looked through the text and has located errors and inconsistencies, and in this way has made a substantial contribution to this book. I also want to thank Marc Young, who did the technical editing in the earlier chapters of the manuscript, and Jennifer Harris, who served as the manuscript editor at the beginning of the project. I would also like to thank the following individuals for their contributions to the book: Gina Cassill, principal compositor; Patricia Masserman, principal proofreader/copy editor; Joel Panchot, interior graphic artist; and Richard Shrout, indexer.

I would like to acknowledge Dan Rogers and Kevin McCall, who are in charge of Microsoft's BizTalk Server group and who have answered numerous questions for me.

Writing this book has required the use of numerous XML tools. I would like to acknowledge the people at Extensibility, Inc., who have answered many questions and provided me with their tool XML Authority. I would also like to acknowledge Vervet for the use of XML Pro, Microstar for Near and Far, and Icon Information-Systems for XML Spy. These are all great XML tools that often work together and have helped me build the examples in this book. In addition to the tools I just mentioned, the wide range of products and tools created by Microsoft—from IE 5 to BizTalk server—are making XML part of corporate solutions today. Without these tools and products, this book could never have been completed.

I would also like to acknowledge my family—Gwen, Maya, William, Lynzie, and Jillian—who once again had to sacrifice their time with me so that I could complete this book.

Finally, I would like to acknowledge you, the reader. Thank you for purchasing this book, and may this book help you understand XML and how to use it in your future work.

Introduction

This book is intended for anyone who wants a glimpse into the next generation of enterprise development. If you want to develop an understanding of Extensible Markup Language (XML) and learn how to use XML for business-to-business (B2B) communications, learn what the Simple Object Access Protocol (SOAP) and BizTalk extensions are, and learn how to use Microsoft Internet Explorer 5 with XML, this book will provide the information you need. You are assumed to have a basic understanding of Microsoft Visual Basic and the Visual Basic Integrated Development Environment (IDE). Developers will find code samples, a discussion of the Internet Explorer 5 document object model, and many more topics. Web developers will find material on using XML to build Web pages. Senior developers and managers will find discussions on how XML can be integrated into the enterprise. Some of the World Wide Web Consortium (W3C) specifications discussed in this book are not final, and they are changing constantly. It is recommended that you visit the W3C Web site at <http://www.w3.org> often for the updated specifications.

WHAT IS IN THIS BOOK

This book provides a detailed discussion of what XML is and how it can be used to build a Digital Nervous System (DNS) using the Microsoft Windows DNA framework with SOAP 1.1, BizTalk Framework 2.0, and Internet Explorer 5. The book is divided into two parts. Part I covers all the essential elements of XML and enterprise development using SOAP and BizTalk. Part II covers XML and Windows DNA. It discusses how to use Internet Explorer 5 and the Windows DNA framework to build enterprise systems. Throughout the book, you will find code samples that will bring all the ideas together.

Part I: Introducing XML

Chapter 1 discusses how XML fits within the enterprise. It provides an overview of DNS, XML, and knowledge workers and includes a discussion of where XML solutions fit into the DNS.

Chapter 2 gives a general overview of markup languages. The chapter begins with a brief history of markup languages. Next, the three most important markup languages are discussed: Standard Generalized Markup Language (SGML), Hypertext Markup Language (HTML), and XML.

Chapter 3 covers the basic structure of an XML document. Topics include XML elements, attributes, comments, processing instructions, and well-formed documents. Some of the more common XML tools will be discussed and demonstrated in this chapter.

Chapter 4 introduces the *document type definition (DTD)*. The DTD is an optional document that can be used to define the structure of XML documents. This chapter provides an overview of DTDs, discusses the creation of valid documents, and describes the DTD syntax and how to create XML document structures using DTDs.

Chapter 5 examines DTD entities. This chapter shows you how to declare external, internal, general, and parameter entities and how these entities will be expanded in the XML document and the DTD.

Chapter 6 covers four of the specifications that support XML: XML Namespaces, XML Path Language (XPath), XML Pointer Language (XPointer), and XML Linking Language (XLink). This chapter provides an overview of namespaces, including why they are important and how to declare them. The chapter will also cover how XPath, XLink, and XPointers can be used to locate specific parts of an XML document and to create links in an XML document.

Chapter 7 covers XML schemas. This chapter discusses some of the shortcomings of DTDs, what a schema is, and the elements of a schema.

Chapter 8 is all about SOAP, version 1.1. This chapter covers the problems associated with firewalls and procedure calls and using SOAP for interoperability. Examples demonstrate how to use SOAP in enterprise solutions.

Chapter 9 examines the BizTalk Framework 2.0. A detailed discussion of BizTalk tags and BizTalk schemas is provided. The next generation of products that will support BizTalk is also discussed. The rest of the chapter focuses on using BizTalk in enterprise solutions.

Part II: XML and Windows DNA

Chapter 10 provides an overview of the Windows DNA framework and the two fundamental models of the Windows DNA framework: the logical and physical models. This chapter focuses on the logical three-tier model, which is defined by the services performed by components of the system. These services fall into three basic categories: user services components, business services components, and data services components. The chapter ends with a discussion of Windows DNA system design.

Chapter 11 covers the majority of the objects in the XML Document Object Model (DOM). This chapter examines how to use the DOM and provides numerous code samples showing how to work with the DOM objects. The DOM objects not covered in Chapter 11 are discussed in Chapter 12.

Chapter 12 discusses how to present XML data in a Web browser using Extensible Stylesheet Language (XSL), how to transform XML documents using XSL Transformations (XSLT), and how to build static user services components using XML. The rest of the chapter examines XSL and XSLT support in the XML DOM and programming with XSL and XSLT.

Chapter 13 covers the creation of dynamic Web-based user services components using Dynamic HTML (DHTML) and the XML Data Source Object (DSO) available in Internet Explorer 5. This chapter will discuss how to use DHTML to create user services components that can respond directly to input from users. The rest of the chapter covers how to use the XML DSO to work directly with XML data embedded in HTML code.

Chapter 14 examines how XML can be used to build business services components. This chapter shows you how to create business services components using HTML Components (HTC).

Chapter 15 explores using XML in the data services component. This chapter discusses using ActiveX Data Objects (ADO) with XML, the Microsoft XML SQL Server Internet Server Application Programming Interface (ISAPI) extension, and the XSL ISAPI extension. The SQL ISAPI extension allows data in a SQL Server 6.5 or 7.0 database to be retrieved directly through Microsoft Internet Information Server (IIS) as XML. The XSL ISAPI extension allows XSL documents to be automatically converted to XML when a browser other than Internet Explorer 5 requests data.

Chapter 16 introduces Microsoft BizTalk Server 2000. BizTalk Server 2000 allows corporations to pass information within the corporation and between the corporation and its partners using XML.

XML TOOLS

There are a number of XML tools available to assist you in developing XML applications. You will find some of these tools used in examples throughout this book. The tools I use are XML Authority from Extensibility, Inc., XML Spy from Icon Information-System, and XML Pro from Vervet Logic. XML Authority provides a comprehensive design environment that accelerates the creation, conversion, and management of XML schemas. XML Spy is a tool for viewing and editing an XML document. XML Pro is an XML editing tool that enables you to create and edit XML documents using menus and screens. You can download Extensibility's tools from www.extensibility.com, XML Spy from <http://xmlspy.com>, and XML Pro from www.vervet.com.

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USING THE COMPANION CD

The CD included with this book contains all sample programs discussed in the book, Microsoft Internet Explorer 5, third-party software, and an electronic version of the book. You can find the sample programs in the Example Code folder.

To use this companion CD, insert it into your CD-ROM drive. If AutoRun is not enabled on your computer, run StartCD.exe in the root folder to display the Start menu.

Installing the Sample Programs

You can view the samples from the companion CD, or you can install them onto your hard disk and use them to create your own applications.

Installing the sample programs requires approximately 162 KB of disk space. To install the sample programs, insert the companion CD into your CD-ROM drive and run Setup.exe in the Setup folder. Some of the sample programs require that the full version of Internet Explorer 5 be installed to work properly. If your computer doesn't have Internet Explorer 5 installed, run ie5setup.exe in the MSIE5 folder to install Internet Explorer 5. If you have trouble running any of the sample files, refer to the Readme.txt file in the root directory of the companion CD or to the text in the book that describes the sample program.

You can uninstall the samples by selecting Add/Remove Programs from the Microsoft Windows Control Panel, selecting Developing XML Solutions Example Code, and clicking the Add/Remove button.

Electronic Version of the Book

The complete text of *Developing XML Solutions* has been included on the companion CD as a fully searchable electronic book. To view the electronic book, you must have a system running Microsoft Windows 95, Microsoft Windows 98, Microsoft Windows NT 4 Service Pack 3 (or later), or Microsoft Windows 2000. You must also have Microsoft Internet Explorer 4.01 or later and the latest HTML Help components installed on your system. If you don't have Internet Explorer 4.01 or later, the setup wizard will offer to install a light version of Internet Explorer 5, which is located in the Ebook folder. The Internet Explorer setup has been configured to install the minimum files necessary and won't change your current settings or associations.

System Requirements

The XML samples in this book can be run using a computer that has at least the following system requirements.

- 486 or higher processor
- Windows 95, Windows 98, Windows NT 4.0, or Windows 2000
- Visual Basic 6 (If you want to perform the Visual Basic examples in the book, you will need to have this installed on your computer.)

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Every effort has been made to ensure the accuracy of this book and the contents of the companion CD. Microsoft Press provides corrections for books through the World Wide Web at the following address: <http://mspress.microsoft.com/support/>.

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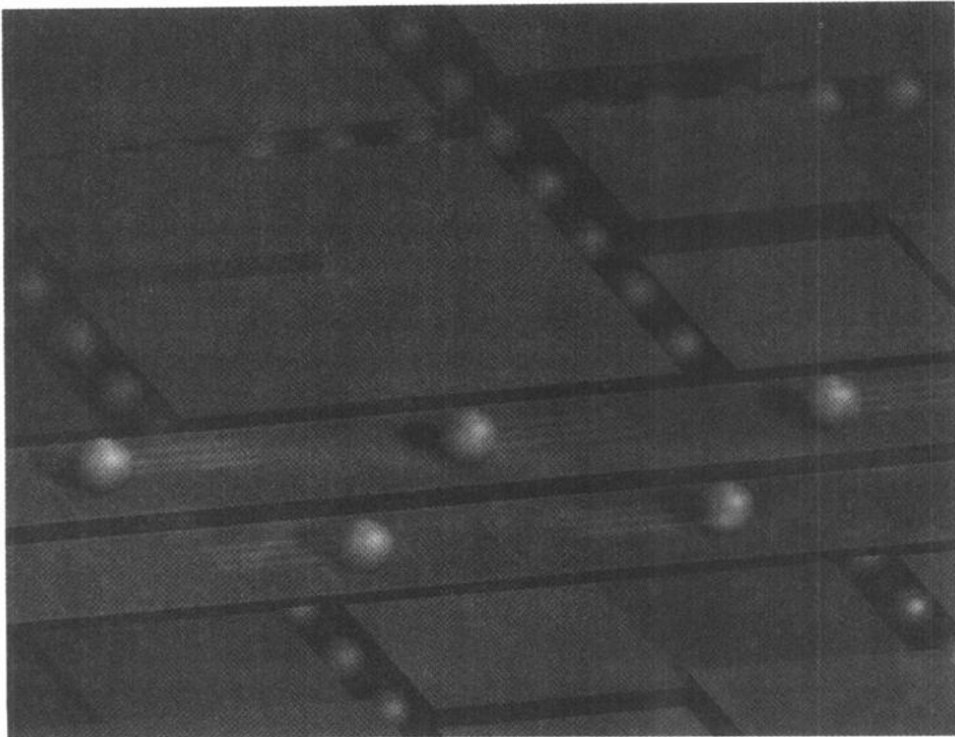
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Part I

Introducing XML



Chapter 1

XML Within the Enterprise

The last four decades of the twentieth century witnessed the birth of the Computer Age. Computers have become an essential tool for nearly every corporate worker. Personal computers are now found in over 50 percent of U.S. households, and with this proliferation has come the explosion of the Internet. The Internet has not only changed the way consumers gather information and make their purchases, but it has also completely changed the way corporations must do business.

Today corporations must be able to respond quickly to market pressures and must be able to analyze large quantities of data to make appropriate decisions. To be of any use to the corporation, this data must be accurate, relevant, and available immediately. As we will see in this chapter, a *Digital Nervous System (DNS)* will provide the corporation with a computer and software infrastructure that will provide accurate, relevant data in a timely manner. One of the most important elements of the DNS is the movement of data. In many circumstances, the ideal way to move this data will be in *Extensible Markup Language (XML)* format.

XML can be used to create text documents that contain data in a structured format. In addition to the data, you can include a detailed set of rules that define the structure of the data. The author of the XML document defines these rules. For example, you could create a set of rules that can be used for validating Microsoft Exchange e-mail documents, Microsoft SQL Server databases, Microsoft Word documents, or any type of data that exists within the corporation.