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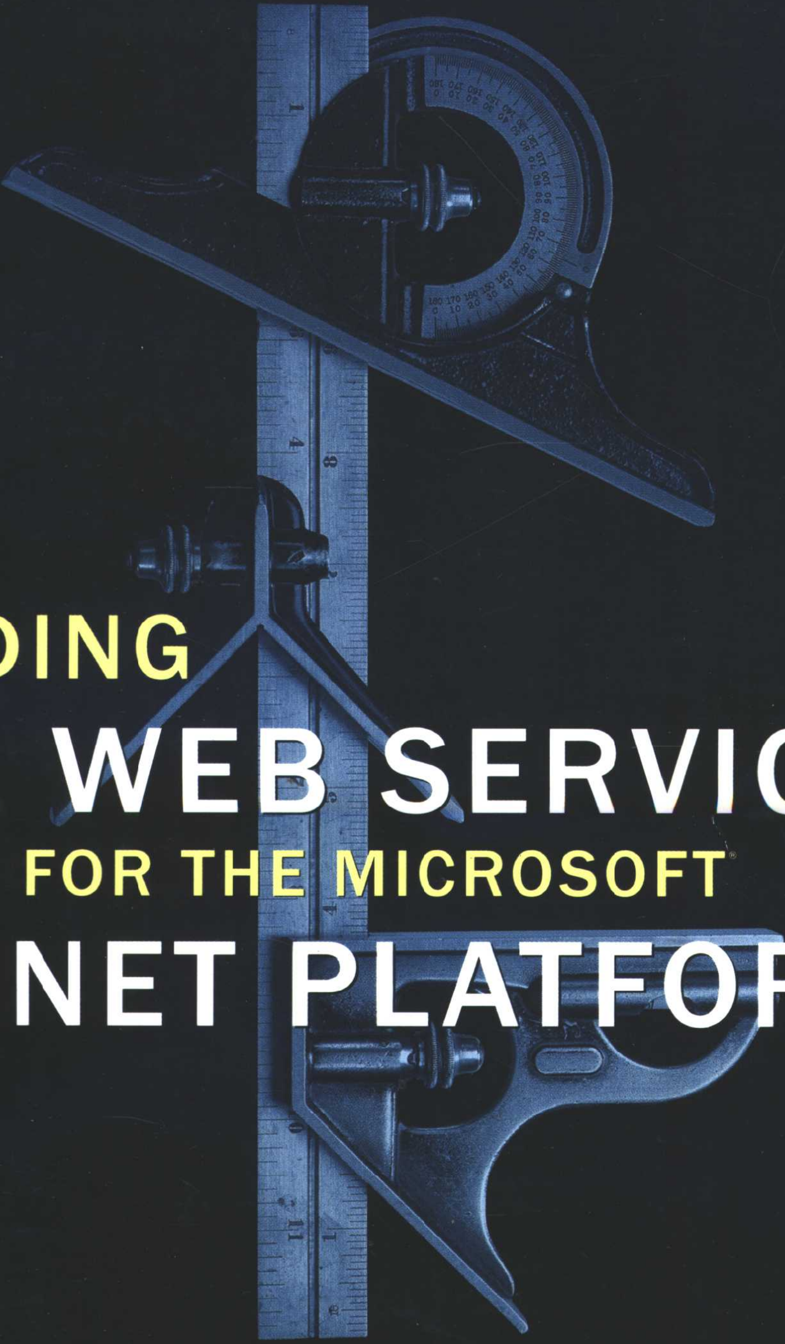

BUILDING XML WEB SERVICES FOR THE MICROSOFT® .NET PLATFORM

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Scott Short

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Building XML Web Services for the Microsoft.NET Platform

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Praise for
Building XML Web Services for the Microsoft .NET Platform

Great description of where Web services are today and how to get bootstrapped building your own.
Henrik Frystyk Nielsen
SOAP, HTTP, and GXA Specification Coauthor
Microsoft Corporation

Scott made me jealous—that's how good this book is.
Keith Ballinger
Program Manager, ASP.NET Web Services and GXA Specifications Coauthor
Microsoft Corporation

As programmers move from DCOM to the .NET platform, they are faced with the challenge of learning the details of Microsoft's architecture for both Web services and .NET Remoting. Scott provides programmers with a great jump start in building distributed applications by covering the essential details and explaining the difference between two different technologies.
Ted Pattison
Technologist and Author
DevelopMentor

This is a clear and concise book for developers who want to move beyond the hype and start building Web services for real.
James Utzschneider
Creator of UDDI
Microsoft Corporation

Scott hits the nail on the head with clear and concise coverage of topics that all Web service developers should know about. If you buy just one book on Web services, this should be the one.
Jeff Prosise
Cofounder and Author
Wintellect

This book provides developers with a practical guide for building Web services on the .NET platform. In it, Scott shares his knowledge and real-world expertise for building XML Web services.
Rob Howard
Program Manager, ASP.NET Team
Microsoft Corporation

Acknowledgments

As with any project of this magnitude, it took a considerable amount of effort from a lot of people to deliver a complete manuscript.

I couldn't ask for a more supportive and loving family. I would like to extend a very special thank you to my wife, Suzanne. Without your support, I never could have completed this book. You supported my decision to write this book even though you were pregnant with our first child when I signed the contracts and you gave birth to our son, Colin Patrick Short, toward the beginning of the project.

I would also like to thank my son Colin for being such a good little proofreader as he quietly sat in my lap as I typed, at least for the first 15 to 30 minutes. Now that the book is done, Daddy has much more time to play!

I have the unique opportunity to work for Microsoft but still enjoy the sunshine and the great skiing that Colorado has to offer. I would like to thank the Microsoft Rocky Mountain District management team for supporting my efforts. Specifically, I would like to thank Catharine Morris for your creativity in making this happen. Jim Sargent, Larry Shaw, Laura Neff, and Scott Johnson, without your support, this project would never have gotten off the ground. Catharine and Jim, good luck with your new positions at corporate. I miss you both!

I work with a very talented group of peers in Colorado and throughout Microsoft. Of those, I would like to thank Michel Barnett and Joe Hildebrand for your peer reviews of the first couple of chapters and Karsten Januszewski for reviewing the Discovery chapter.

I would also like to thank Mike Howard and Peter Roxburg. Your contributions to the manuscript directly affected getting this book in the hands of the readers in a timely fashion. Thank you both for reading my nagging e-mails about topics I wanted covered in your material.

I would also like to thank the Microsoft Press project team. You guys have been incredibly supportive throughout the entire project. David Clark and I met early on to discuss potential projects. David, thank you for thinking of me when the opportunity to write the Web services title presented itself. Kathleen Atkins was the enforcer. Kathleen, thank you for taking on the unenviable task of ensuring that I didn't slip the schedule too much. Dail Magee Jr. helped ensure the technical accuracy of the content. Dail, thank you for your colorful commentary in the edited text. I too believe that "the publishing industry went astray when it stopped using scrolls." Ina Chang had the responsibility of transforming my raw material into prose.

Through the course of the project, there were quite a few late nights in which I found myself staring at my computer screen completely exhausted and unmotivated. During these times, I would often fire up my Web browser and look at Jeff Prosise's *Book Blog* (*http://www.wintellect.com/about/instructors/prosise/blog/*), his online diary of the book-writing experience. Reading through a couple of entries always seemed to provide motivation to crank out a few more pages. Jeff, thank you for your inspiration as well as taking the time to give me advice now and then.

Finally I would also like to thank all of the folks in the product group for their support with this project. You all gave me the best material in the industry to write about. Specifically, I would like to thank Keith Ballinger, Rob Howard, Karsten Januszewski, Angela Mills, Jonathan Hawkins, Peter de Jong, Scott Guthrie, and Oliver Sharp.

Introduction

You can hardly pick up a technical magazine, developer conference brochure, or corporate IT strategy document without seeing a reference to Web services. So what is all the hype about? Simply put, Web services allow developers to create unrestricted applications—applications that span different operating systems, hardware platforms, and geographic locations. In this book, I explain what Web services are and how you can leverage the Microsoft .NET platform to build and consume them.

Whom This Book Is For

To get the most out of this book, you should be an experienced programmer. The platform on which you have gained your experience is not important. However, you should have a reasonable handle on object-oriented concepts and basic programming constructs.

You should also have some familiarity with basic C# syntax. All examples in this book are written in C#. But even if your primary development language is not C#, the examples are simple enough that you should be able to easily port them to other .NET languages, such as Microsoft Visual Basic.

How This Book Is Organized

Developers generally fall into two groups: those who like to learn the underpinnings of a technology before they use it, and those who have little concern about what is going on under the hood and feel comfortable using a tool set that abstracts many of the details. I personally fall into the former category and, chances are, if you have purchased a 400-plus page book dedicated to Web services, so do you. Therefore, I've decided to take a bottom-up approach to presenting Web services and the support that the .NET platform provides for building and consuming them.

It is hard to make sense of the details unless you have a good grounding in how Web services fit into the overall solution, so the first two chapters of the book provide the necessary background. In Chapter 1, I explain the rationale behind Web services. I also present an overview of the underlying protocols and explain how they build on one another to provide an overall solution.

Chapter 2 offers a high-level overview of how to use Microsoft Visual Studio .NET to create and consume Web services hosted on the ASP.NET platform. My primary goals in this chapter are to give you an appreciation of how well the ASP.NET runtime abstracts the underlying protocols for the developer and to explain where the protocols come into play in the context of a functioning Web service.

In Chapters 3 through 5, I discuss the core underlying Web services protocols in detail—what some might consider too much detail. Frankly, much of the content in these chapters could have gone into the appendix, but unfortunately the limitations of the publishing process prevented me from making such a drastic change to the structure of the book. So you will have to wait until the second edition.

Meanwhile, I recommend that you skim those chapters the first time through. As you become more involved with Web services, you can give them a more thorough read. There is no better way to advance your understanding of Web services than to have a deep understanding of the underlying protocols, especially if you need to interoperate with a Web service that is hosted on another platform.

In Chapters 6 through 8, I get into the heart of the book and explain ASP.NET and Remoting, the core .NET technologies that enable developers to quickly build and consume Web services. These seemingly overlapping technologies have distinctly different goals. The primary focus of ASP.NET Web services is to maintain the fidelity of the instances of XML datatypes passed between the client and the server. This is in sharp contrast to Remoting, in which the primary focus is to maintain the fidelity of the instances of .NET types passed between the client and the server. In time, these two goals will be achieved by a unified technology set.

In the remaining chapters of the book, I cover specific topics relevant to most production-quality Web services. Chapter 9 explains how to leverage UDDI and DISCO to advertise your Web service and discover other Web services. In Chapter 10, I examine strategies for ensuring that your Web services are secure. In Chapter 11, I explain how to debug your Web service. Chapter 12 offers strategies for ensuring that your Web service meets your scalability and availability needs. Finally, in Chapter 13, I examine some of the problems involved in building Web services today and introduce emerging technologies that are aimed at addressing these problems.

If You Are in a Hurry

Sometimes I have been engaged in a project for which I need to use a technology that I know little or nothing about. In these cases, I try to learn just enough about the technology to solve the problem at hand. When you find yourself in such a situation, take advantage of the fact that I wrote each chapter of this book to be read individually, without requiring the previous chapters as background. For example, you can pick up the book and start reading Chapter 6, the ASP.NET chapter, without first reading the chapters on SOAP, XML Schema, or WSDL.

So, without further ado, here is what I recommend you do if you want to get up to speed as quickly as possible developing and consuming Web services:

Skim through Chapter 1 to get a sense of how the technologies and protocols that compose Web services fit together.

Read Chapter 2, and load Visual Studio .NET to follow the steps presented as I build two simple applications. This will help familiarize you with developing basic Web services using the Visual Studio .NET tool set.

Pick out the important pieces of Chapter 6 that apply to your project.

Read the "Interactive Debugging" section of Chapter 11, which is about debugging Web services using the Visual Studio .NET debugger.

Read Chapters 9 and 10 (on Discovery and Security, respectively) as needed.

Throughout the course of the project, thoroughly read Chapters 6 and 7 to get a concise but in-depth overview of how to use the ASP.NET platform to develop and consume Web services.

Finally read the other chapters as needed for your project. For example, if you plan to leverage UDDI, read Chapter 9 for relevant information about publishing your Web services and discovering other Web services.

System Requirements

To work through all the samples in this book, you need the hardware and software listed in Table I-1.

Table I-1 **Hardware and Software Requirements**

Component	Requirements
Visual Studio .NET	Enterprise Architect, Enterprise Developer, Professional, or Academic Edition
Processor	Pentium III class, 600 MHz or faster
RAM	128 MB or more for Windows 2000 or Windows XP Professional and 256 MB or more for Windows .NET Server
Hard disk	500 MB on the system drive and 3 GB on the installation drive
Operating system	Windows .NET Server, Windows XP, Windows 2000 or Windows NT 4.0
CD-ROM or DVD-ROM drive	Required
Video	800×600 high color (16-bit or higher)
Mouse	Microsoft mouse or compatible pointing device

The Companion CD

Many of the samples in this book were too long to print in their entirety without interruption by explanatory text. In reading reviews of other technical books, I have learned that some readers do not like this approach. If you prefer to see a sample application in its entirety, you can go to the companion CD, which contains most of the source code presented in the book.

You can view the contents of the CD by inserting it into your CD-ROM drive. If you have the Windows autorun feature enabled, a splash screen will appear and provide you with options for use.

If you don't feel like lugging around your laptop along with this book, then bag the book! The companion CD also contains an electronic version of the book (an eBook). One of the best features of the eBook is that it is fully searchable. For information about installing and using the eBook, see the Readme.txt file in the \eBook folder.

Support

I have made every effort to ensure the accuracy of the contents of this book and the accompanying code on the companion CD. Despite my efforts, some errors and omissions inevitably occur in this text. Therefore, monitor the list of updatesandcorrectionsthatwillbepostedat*http://www.microsoft.com/mspress/support/*
.

If you find what you believe is an error or have a suggestion as to how I could improve the book, please send correspondence to either of the following addresses:

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Me a handsomely consructed credit card validation component. Well documented hard working and looking to become part of a fast moving application with a positive vision for reuse.
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Weekends and
SOAP
56 kbps
XML
WSDL
Technical specification
TRANSACTION COMPLETE

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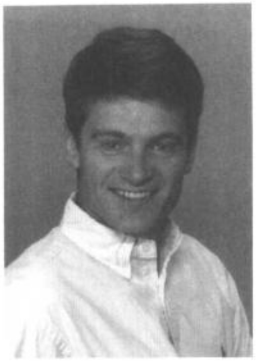

Scott Short is currently a Senior Consultant with Microsoft Consulting Services. He works with a number of high-tech companies, helping them develop scalable, available, and maintainable e-business applications. He is always interested in working with companies to solve challenging problems, so feel free to contact him at *sshort@microsoft.com*.

Scott has also contributed to a number of books about developing .NET applications and is a frequent speaker at professional developer conferences.

Scott's primary motivation for moving to Colorado was to be closer to the Rocky Mountains. When not glued to his computer, Scott enjoys spending time with his family and friends skiing, backpacking, hiking, and rock climbing. He also loves spending evenings with his wife Suzanne and his son Colin.

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