Pro ASP.NET for SQL Server

High Performance Data Access for Web Developers

Brennan Stehling

Pro ASP.NET for SQL Server: High Performance Data Access for Web Developers Copyright © 2007 by Brennan Stehling

All rights reserved. No part of this work may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage or retrieval system, without the prior written permission of the copyright owner and the publisher.

ISBN-13 (pbk): 978-1-59059-860-3 ISBN-10 (pbk): 1-59059-860-1

Printed and bound in the United States of America 987654321

Trademarked names may appear in this book. Rather than use a trademark symbol with every occurrence of a trademarked name, we use the names only in an editorial fashion and to the benefit of the trademark owner, with no intention of infringement of the trademark.

Lead Editors: Jonathan Gennick, Jim Huddleston

Technical Reviewer: Vidya Vrat Agarwal

Editorial Board: Steve Anglin, Ewan Buckingham, Gary Cornell, Jonathan Gennick, Jason Gilmore, Jonathan Hassell, Matthew Moodie, Jeffrey Pepper, Ben Renow-Clarke, Dominic Shakeshaft,

Matt Wade, Tom Welsh Project Manager: Kylie Johnston Copy Editors: Sharon Wilkey, Ami Knox

Assistant Production Director: Kari Brooks-Copony

Production Editor: Ellie Fountain

Compositor: Diana Van Winkle, Van Winkle Design

Proofreader: April Eddy Indexer: Carol Burbo

Cover Designer: Kurt Krames

Manufacturing Director: Tom Debolski

Distributed to the book trade worldwide by Springer-Verlag New York, Inc., 233 Spring Street, 6th Floor, New York, NY 10013. Phone 1-800-SPRINGER, fax 201-348-4505, e-mail orders-ny@springer-sbm.com, or visit http://www.springeronline.com.

For information on translations, please contact Apress directly at 2855 Telegraph Avenue, Suite 600, Berkeley, CA 94705. Phone 510-549-5930, fax 510-549-5939, e-mail info@apress.com, or visit http://www.apress.com.

The information in this book is distributed on an "as is" basis, without warranty. Although every precaution has been taken in the preparation of this work, neither the author(s) nor Apress shall have any liability to any person or entity with respect to any loss or damage caused or alleged to be caused directly or indirectly by the information contained in this work.

The source code for this book is available to readers at http://www.apress.com in the Source Code/Download section.

Contents at a Glance

About the Author	X
About the Technica	al Reviewer
Acknowledgments	;
Introduction	
CHAPTER 1	Getting Started
CHAPTER 2	Data Model Choices37
CHAPTER 3	Database Management55
CHAPTER 4	Databound Controls73
CHAPTER 5	SQL Providers111
CHAPTER 6	Caching 147
CHAPTER 7	Manual Data Access Layer191
CHAPTER 8	Generated Data Access Layer
CHAPTER 9	Deployment
CHAPTER 10	A Sample Application
APPENDIX	Photo Album
INDEX	399

Contents

About the Author		. XI
About the Technic	cal Reviewer	xiii
Acknowledgment	ts	X۷
•)	
indoddolloll		
CHAPTER 1	Getting Started	. 1
	Preparing Your Environment	. 1
	Project Organization	. 2
	Common Folders	. 4
	Datasource Configuration	. 5
	Code and Database Separation	. 7
	Managing Provider Services	. 7
	Using the Command Line	. 8
	Mixing and Matching Providers	11
	Configuring Providers	11
	Membership Configuration	13
	Roles Configuration	14
	Profile Configuration	15
	Creating Users and Roles	18
	Securing the Admin Section	34
	Creating the Admin User	35
	Summary	36
CHAPTER 2	Data Model Choices	07
UNAPIEN Z	Data Model Giloices	31
	The Data Access Application Block	37
	Data Access Code Snippets	39
	Sample Database	46
	Trivial Data Examples	47
	Nontrivial Data Examples	49
	Typed DataSet	49
	Nontyped DataSet	51
	DataReader	53

	DataObject
CHAPTER 3	Database Management55
	Using Database Projects55Visual Studio56SQL Server Management Studio57Managing Stored Procedures57Managing Indexes and Constraints62Performance Considerations65Stability Considerations70Unit Tests for Data70Continuous Integration71Summary71
CHAPTER 4	Databound Controls73
	DetailsView73FormView74GridView76Editing and Validating Fields77Binding Input Parameters81Binding Input Parameters with a Control81Binding Input Parameters Programmatically82Binding a User Control83Embedding Databound Controls84ViewState and Databinding87Session and ViewState87Paging88Disabling ViewState89ControlState vs. ViewState89Creating a Databound Control91Getting the Data94Getting the Total Rows Count97Wiring the Pager Events98Creating PersonRow101Persisting ViewState Manually105Working Without ViewState107Walking the Debugger109Summary110

CHAPTER 5	SQL Providers111
	The SqlMembershipProvider112
	Using XML Implementations113
	Setting the Database Connection
	Creating a Password Policy114
	The SqlRoleProvider
	Controlling Access by Role115
	Controlling Behavior by Role
	The SqlProfileProvider118
	Why Anonymous Profiles?
	Configuring Anonymous Profiles119
	Managing Anonymous Profiles120
	Anonymous and Authenticated Profile Differences
	Migrating from Anonymous to Authenticated121
	Creating a User122
	Dynamic Profiles and Profiles as BLOBs
	Using the Provider-Powered ASP.NET Controls
	Building a SQL Photo Album Provider
	Provider Requirements
	Configuration Section Class
	Provider Collection Class
	Abstract Provider Class
	The Provider Implementation
	Provider Service Class
	Unit Testing
	The Finished Product
	Building a SQL SiteMap Provider
	SiteMap Requirements
	Implementing SiteMapProvider
	Summary
CHAPTER 6	Caching 147
	Alternatives to Caching148
	Application State149
	Session
	ViewState150
	Current Context
	Caching Options153
	Output Caching153
	Data Caching159

	Invalidating Cached Data	164
	Absolute Expiration	164
	Sliding Expiration	164
	Cache Dependency	165
	Manual Removal	165
	SQL Cache Dependencies	165
	Using the SqlDependency and SqlCacheDependency	165
	Polling	168
	Query Notifications	172
	Troubleshooting Query Notifications	176
	Problems with Caching	186
	Performance Strategies	187
	Data Warehousing	187
	Lazy Loading	188
	Summary	189
CHAPTER 7	Manual Data Access Layer	191
	Using DataSets, Inline SQL, and Stored Procedures	191
	DataSets	192
	Inline SQL	196
	Stored Procedures	198
	Using DataObjects and the ObjectDataSource	199
	Design Contract	200
	Data Contract	201
	Testing the Design and Data Contracts	203
	Building the Database	203
	Creating the Database Structure	203
	Consolidating the Data	204
	Managing Relationships	204
	Created and Modified	205
	What About Nulls?	206
	Using Database Projects	208
	The Data Access Layer	217
	Building the Website	225
	Connecting the Data Access Layer	225
	Creating User Controls	226
	Creating the Pages	
	Summary	231

CHAPTER 8	Generated Data Access Layer233
	Code Generation
	CodeDom Namespace237
	Templating241
	SubSonic 242
	SubSonic Templating243
	Partial Classes
	Query Tool
	Scaffolding
	Blinq
	Summary
CHAPTER 9	Deployment
	Automation with MSBuild
	Deploying the Website
	Website Deployment Projects
	PostBuild Deployments
	Deploying the Database
	Generating Change Scripts271
	Automating Database Updates
	Custom Configuration Sections
	Summary
CHAPTER 10	A Sample Application
	Understanding Performance and Scalability289
	Concurrent Requests
	Bottlenecks
	Traffic Spikes291
	Distributing Traffic
	Distributing Content
	Distributing Services
	Distributing the Back End
	Planning for Scalability
	The Sample Application
	Creating the Database
	Get, Save, and Delete

	Creating Data Access Providers	303
	EventProvider Object	303
	Revised DomainObject	307
	Managing Relationships	
	Using Locations	
	Custom Configuration	314
	Configuration Grouping	315
	Declaring the Custom Configuration	317
	Configuring the Providers	318
	Creating New Providers	321
	Implementing a LINQ Provider	
	Implementing a WCF Provider	332
	WCF Service Requirements	333
	Hosting the Service	335
	Defining the DataContracts	336
	Configuring the Provider	336
	Using the Providers	337
	Summary	341
APPENDIX	Photo Album	343
	Photo Album Provider	3/13
	Configuration	
	Classes	
	Table Scripts	
	Constraints Scripts	
	Stored Procedure Scripts	
	Website Classes	
	SQL SiteMap Provider	
	Classes	
	Table Scripts	
	Stored Procedure Scripts	
INDEX		399