Introduction

Welcome to the first edition of *Maximizing Performance and Scalability with IBM WebSphere* from Apress.

Over the past three years, IBM has proven WebSphere's power by molding it into a powerful, scalable, and robust Java 2 Enterprise Edition (J2EE) application server platform. Each major release since 3.5 has included impressive redundancy, scalability, and performance features that continue to put IBM WebSphere at the forefront of high-end J2EE computing.

IBM's persistence in the areas of scalability and performance has paid off. This book is all about that—the science and art of tuning, sizing, and configuring your IBM WebSphere server platform to be optimized to maximize your organization's J2EE application cost-effectiveness.

More and more Internet sites, as well as internal corporate applications, are being built upon the IBM WebSphere platform, and therefore more than ever, it's critical to an organization's Information Technology (IT) excellence to look for ways to optimize and tune its platforms. With the help of this book, you'll see how to approach, plan, and ultimately optimize and tune your WebSphere platforms using structured and battle-proven techniques.

This book covers both WebSphere 4 and 5. As with most enterprise software suites, at any given time, IT organizations may be operating multiple versions of key software products. In WebSphere's case, having a reference guide such as this book, which covers both WebSphere 4 and the newer advanced performance features of WebSphere 5, ensures that organizations not looking to migrate off WebSphere 4.*x* immediately can still reap the benefits of optimization and tuning.

Just as you tune your car to ensure that it runs efficiently and economically, IT managers and Chief Information Officers (CIOs) should use this book to obtain the same positive results for their IBM WebSphere platform.

In summary, with the two versions of WebSphere covered in this book, the optimization and performance characteristics are subtle; however, given that a particular setting in WebSphere 4 may produce a completely different result under WebSphere 5, you'll benefit from this dual-version book.

Who Should Read This Book

This book was written for system managers, platform and J2EE architects, and IT managers. If your job involves designing and or managing WebSphere servers, then this book will be beneficial to you.

Lead and senior Java/J2EE developers can also benefit from this book. Quite often, developers don't get exposed to the important platform-specific considerations and issues when developing applications. HTTP sessions, database accesses, and the combination of failover capability and scalability are several common areas of high-end J2EE application design that often get little focus during design and development.

Therefore, senior developers can gain valuable insight into designing and developing WebSphere-deployed J2EE applications with the strategies and recommendations within this book.

How to Use This Book

This book is broken into 14 chapters. Each chapter covers a specific topic that can be read on its own as a reference guide.

The book alternatively can be read cover to cover to pick up more on the methodology and frameworks that are discussed during Chapters 1 and 2 that, with subtlety, carry through the rest of the book. In this manner, you'll discover the optimal ways to put together a WebSphere platform architecture using a baseline methodology and then design and tune your platform to operate optimally.

The underlying message that the book tries to convey is to always use a methodology and have a purpose in what you're doing.

In **Chapter 1**, you'll explore what performance is all about, why you should care about it, and how to model it. Although this may seem somewhat obvious, it's important to consider performance from the perspective of WebSphere, with a business focus. Too often system managers and architects look at performance as being totally about technology; this chapter explores what performance is really about.

Chapter 2 explores scalability, availability, and performance from the point of view of your architecture. That is, what do you need to consider in terms of scalability and availability when formulating a WebSphere platform design or architecture?

Chapter 3 looks at the WebSphere architecture. In this chapter, you'll explore all the different components and subtle differences between WebSphere 4 and 5. This is an important chapter given that you'll need to be familiar with the definitions of all the components and underlying architecture of WebSphere.

In **Chapter 4**, you'll explore and consider the technologies that make up a WebSphere platform. You'll look at key design considerations for disk systems, networks, and infrastructure concepts. From this chapter, you'll be able to select and model your WebSphere infrastructure design based on my recommendations and guidelines.

Chapter 5 explores key topological architectures that are possible with WebSphere. You'll look at good and bad platform architectures, with

recommendations for each model. I provide guidelines to help provide direction for where each different topology is best used and how to understand your requirements.

Chapter 6 starts to explore the fundamentals of tuning WebSphere. In this chapter, you'll explore tuning key components such as the WebSphere Object Request Broker (ORB), networking components, performance optimization for the integration of other systems, and much more. Using the experience and details from earlier chapters, this chapter builds on the strategy and methodology of performance optimization.

In **Chapter 7**, you'll look at WebSphere's clustering and workload management capabilities. This chapter explores how to configure, tune, and optimize your WebSphere platform for high availability and performance.

Chapter 8 looks at ensuring high performance and robustness when you interface your WebSphere platform with external systems such as Lightweight Directory Access Protocol (LDAP) and NT File System (NFS) servers.

In **Chapter 9**, you'll look at optimizing and tuning your WebSphere platform's Enterprise JavaBean (EJB) and Web container components. As you'll discover, these two components are key to your overall performance and availability of your deployed J2EE applications.

Chapter 10 explores 20 best-practice development factors that help you ensure performance, availability, and scalability of your deployed applications. As you'll explore during earlier chapters of the book, high performance and robustness don't start when the WebSphere platform architect or system managers start to model their environment. This chapter looks at some "low hanging fruit" ways to better your application development—ones that quite often cause performance and scalability problems when your applications are deployed.

Chapter 11 explores the tuning and optimization of Oracle 8*i*, Oracle 9*i*, and IBM DB2 for use with WebSphere J2EE-based applications. You'll look at core database tuning approaches as well as some optimization approaches on the WebSphere side of the JDBC-instigated transactions.

In **Chapter 12**, you'll look at what options and strategies exist for ensuring a level of high performance and robustness with your legacy systems. Legacy systems are found in all IT organizations and may extend from something as recent as a COM+ or DCOM environment through to something a little more vintage, such as a VAX-based environment. This chapter explores some methodologies and approaches to ensure a degree of performance and compartmentalization.

Chapter 13 looks at some high-quality commercial and open-source software to help profile, benchmark, and monitor your WebSphere application environment. You'll explore how to implement these types of software tools to understand your WebSphere platform's state of performance and load.

Finally, in **Chapter 14**, you'll use the details from Chapter 13 to look at how to benchmark your WebSphere platform, take those results, and then feed them back into a performance methodology. In this chapter, you'll further explore WebSphere application profiling and look at ways to use the information obtained from benchmarking and profiling tools.

What This Book Is Not

It's important to point out that this book isn't a WebSphere administration manual. Although this book can definitely complement a WebSphere administration guide, its purpose is to provide you with a strategy and methodology for planning your WebSphere platform's optimization and performance.
So often, performance and scalability, as I'll discuss in Chapter 1, is considered achievable by simply purchasing lots of capacity and hardware. This is fundamentally wrong. What this book therefore explores is why you should set certain parameters for your platform's needs.

In Closing

Use this book as a strategy. Earlier chapters provide you with the guidance and approach needed to execute your performance methodology, and later chapters in the book provide you with the know-how, guidelines, and recommendations to implement your WebSphere platform performance management strategy.