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WebSphere Application Server Administration Using Jython

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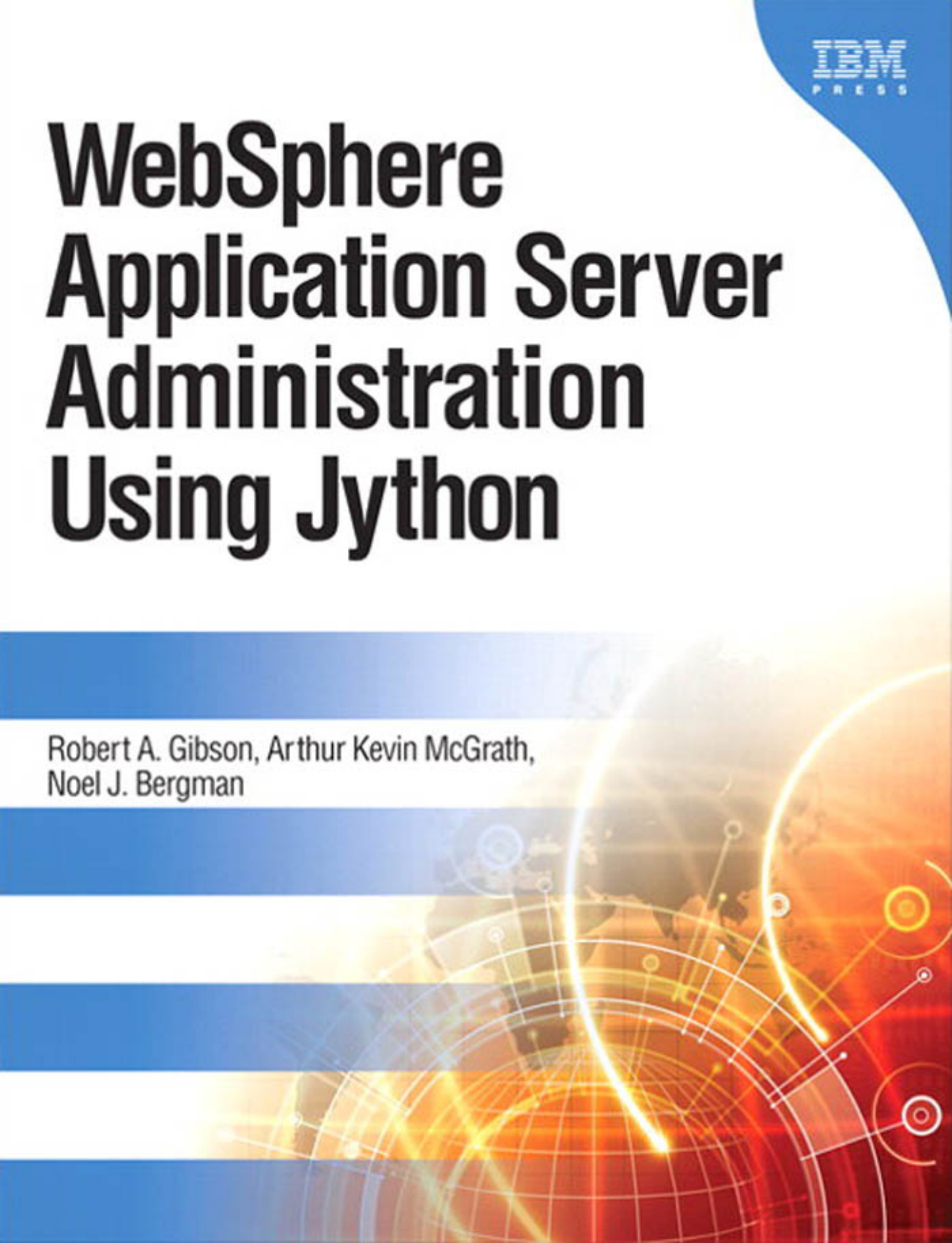

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CHAPTER 1

Introduction

Why Is This Book Necessary?

For years we have been enthusiastically pounding the table, so to speak, saying that scripting is "where it's at!" for WebSphere® administrators. All the while, we (along with our students) have wished for a book that would enable more people to use Jython[1] for their scripting needs. We finally got together and set out to write one, and we hope this book addresses not only our own desires and demands but yours as well.

Websphere's robust and versatile scripting facility differentiates the IBM® WebSphere Application Server product from competitors in the Java™ EE server marketplace. As convenient and friendly as the Integrated Console can be, the true power for administrators is in scripting. This is probably evident to anyone who has had to configure something on multiple machines or perform the same configuration numerous times.

IBM's support for scripting that is built into the WebSphere platform is staggering. As you delve into it, you discover all sorts of hidden capabilities and ease-of-use features and quickly develop a greater understanding of how WebSphere fits together. Were we to deliver a book containing but a single page on each aspect of the available script objects, you'd need a forklift to take it home. Instead, we've hopefully provided you with a book that helps prepare you for a journey of discovery. We have documented and explained the scripting concepts, the core objects, and many of our favorite techniques, while demonstrating some new ones of our own.

[1] Jython is an implementation of the Python programming language that executes on a Java Virtual Machine.

If you will, think of WebSphere as a healthy, bio-diverse, coral reef, rich in wildlife. In this book, we teach you to master the core concepts necessary to explore the reef and introduce you to many of our favorite reef denizens. Afterward you will be prepared to explore more of the reef on your own, discovering for yourself more of the richness that IBM has built into WebSphere. Once you've mastered the core concepts, self-discovery becomes important; each new product layered on WebSphere (for example, WebSphere Enterprise Service Bus and WebSphere Process Server) and each new version adds more and more scripting capabilities. So in the way of the ancient parable, we will not only give you some fish, but also teach you to fish.

We hope that you enjoy the book...and the journey.

—Bob, Kevin, and Noel

About the WebSphere Application Server Product

The WebSphere Application Server is a large and complex product. As such, it is function-rich and can be configured and used in numerous ways. But you probably know that already. The kind of person likely to pick up this book and consider buying it is someone who has an understanding of what the WebSphere Application Server is and just how challenging its administration can be. It is also likely that you have either tried administering the product or might be wondering how to administer it using scripting. If you've gone down this road on your own, you have probably had some challenging moments (alright, hours) attempting to get your scripts to "behave." That is what this book is all about.

This book is not for the novice WebSphere Application Server administrator. It doesn't define or explain J2EE™ or an application server. Definitions and explanations of foundational topics are available elsewhere (see the online documentation[2]). This book is focused on the topic of scripting for the WebSphere Application Server environment.

In writing this book, we spent a great deal of time trying to understand this beast and what is required to administer a WebSphere Application Server using the examples that exist in the available documentation. As a WebSphere Application Server technical support analyst and team lead, and as instructors, we have also spent a great deal of time sharing our knowledge of this topic with others. That, too, is what this book is about—sharing some of what we have learned with those who are interested in learning.

This Book and Its Organization

We tried to organize this book in an easy-to-understand manner. To begin, we discuss Jython.[3] Chapters 2 through 5 describe Jython with enough detail that those unfamiliar with it should be able to readily "pick up" the language and use it effectively.

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[2] http://www.IBM.com/software/webservers/appserv/was/library/.

[3] Python is a programming language, and Jython is an implementation of that language. We won't worry about this distinction and will continue to refer to it as the Jython programming language for simplicity's sake.

It should be noted that this book is not meant to be an introduction to programming or even an introduction to the Jython programming language. We could easily fill hundreds more pages on just the topic of "Programming with Jython." There are lots of books, papers, and websites that discuss the syntax and semantics of Python and therefore the Jython programming language.[4] This book is not intended to replace nor duplicate the information available elsewhere. If you already feel comfortable with Jython (or more precisely Python) as a programming language, you might be able to skip the chapters that describe Jython and begin with Chapter 6.

For those readers who might be less familiar with Jython as a programming language, this book attempts to present the rules, characteristics, and properties of Jython in a logical order, so as to build a solid foundation of information. A little is presented at time and then revisited and expanded upon, providing reinforcement through repetition. Additionally, each chapter is filled with working examples to help you better understand not only the Jython code, but the wsadmin scripting objects as well. Almost all of the examples described are available from the IBM Press website for this book[5] and are provided to minimize the need to search other sources for useful examples.

Chapter 6, "wsadmin," explores the **`wsadmin`** command in detail and explains the command and its parameters thoroughly. A number of the parameters don't seem to get a lot of use. That may be because when you first start using **`wsadmin`**, you can quickly get to a subset of the parameters that you use "all the time." For many tasks, this is a reasonable approach to getting the job done. However, in so doing, you might have forgotten or not even realize that some **`wsadmin`** parameter exists that might make your life easier. This chapter will help broaden your understanding of this command. You never know, you may even find something that you can use right away.

Chapter 7, "Introduction to Admin Objects," is a must-read because it explains how to configure **`wsadmin`** in order to use many of the examples shown later in the book. The **`wsadmin`** properties that are shown in this chapter (specifically the changing of the profiles directive) provide an environment upon which many of the later examples depend.

Chapter 8, "The AdminConfig Object," is the beginning of the explanation of the **`wsadmin`** scripting objects. Specifically, it explains the **`AdminConfig`** scripting object in great detail. Many administrative scripts deal primarily with the AppServer configuration use and depend upon this scripting object for the vast majority of these manipulations. A number of useful examples are provided to demonstrate just how helpful this scripting object can be.

Chapter 9, "The AdminControl Object," describes the **`AdminConfig`** scripting object in similar detail. This object is used by scripts that need to manipulate active AppServer objects (MBeans). So this chapter is full of useful information for those types of scripts.

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[4] Please note, however, that the version of Jython that is provided and supported by the wsadmin utility does not include all of the features and facilities available in the "latest and greatest" version of Python. So, keep this in mind as you are writing your wsadmin scripts.

[5] http://www.IBMPressBooks.com/title/9780137009527.

Chapter 10, "The AdminApp Object," covers the **AdminApp** scripting object in detail. This object is used to list, view, install, uninstall, and modify AppServer applications. As such, this chapter explains how to perform these operations using the **AdminApp** object methods.

Chapter 11, "The AdminTask Object—Server Management," is where we begin the description of some of the **AdminTask** scripting object methods. The **AdminTask** object is enormous. Additionally, as is explained in this chapter, the methods included vary based upon a number of factors. The scope (as in breadth and depth) of this object is huge. It includes hundreds and hundreds of methods. As such, there is no way for it to be adequately covered in a single chapter. In fact, Chapters 12 through 15 largely deal with **AdminTask** object methods. That's not all they cover, but it is at the core of each of these chapters.

Chapter 12, "Scripting and Security," deals with scripting and security. As such, it addresses a number of security-related items. Anyone who needs to administer an enterprise application server should be familiar with the topics described in this chapter.

Chapter 13, "Databases and Authorization," covers databases and authorization. Even though the configuration and administration of database-related resources can seem overwhelming, this chapter presents these topics in a simple fashion. You discover the easy way to configure the database-related resources ("the plumbing," if you will) required for interactions with a database. These explanations include descriptions about the properties you can control and those that are automatically configured for you. The chapter then moves into exploring and manipulating the more complicated aspects and properties of database-related resources and then finishes with a detailed explanation of commonly used database and authorization **AdminTask** methods.

Chapter 14, "Messaging," is all about messaging. This complicated topic is explored in detail but explained simply. The chapter starts by discussing messaging basics and then adds a discussion of security. It ends by explaining the more commonly used messaging **AdminTask** methods in great detail.

Chapter 15, "Administering Web Services," is all about Web services. So what exactly are Web services? The IBM online documentation has this to say about Web services:

> Web services are self-contained, modular applications that can be described, published, located, and invoked over a network. They implement a services-oriented architecture (SOA), which supports the connecting or sharing of resources and data in a very flexible and standardized manner. Services are described and organized to support their dynamic, automated discovery and reuse.

This chapter describes Web services and explains how they should be managed. It also discusses policies, policy sets, bindings and even the use of keystores for the security-related aspects of Web services.

Lastly, Chapter 16, "Version 7.0 Scripting Libraries," is about the scripting object libraries that are included in version 7 of the AppServer product. These Jython libraries demonstrate some techniques for the management and manipulation of AppServer entities. Some people find the programming interface provided by some of the **wsadmin** scripting objects difficult to understand and even harder to work with. These libraries present another approach and provide methods that use simpler parameter lists to some of these scripting object methods.

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