
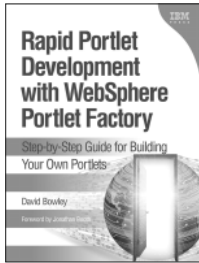


WebSphere Application Server Administration Using Jython

Robert A. Gibson, Arthur Kevin McGrath,
Noel J. Bergman



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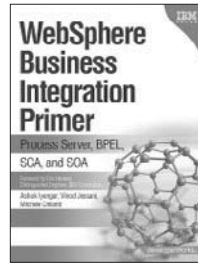
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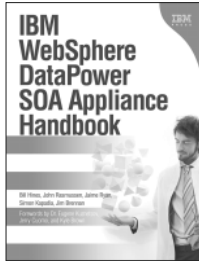
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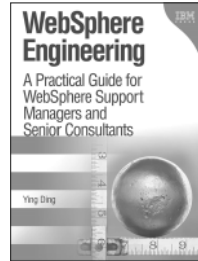
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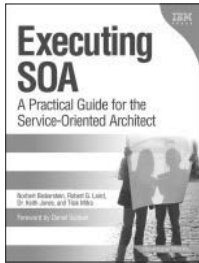
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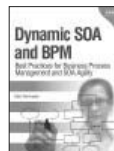
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From the authors

Speaking with one voice, we wish to dedicate this book to the Gibson family.

From Bob Gibson

I thank God for his countless gifts and blessings and dedicate this work to my bride of 30 years, Linda, and our children. I'm sorry for all the time that this has required, but I have thought of you all throughout its development. I also thank everyone who helped make this book a reality. I could not have done this without your assistance, nor would it have been anywhere as good as you have helped make it.

From Arthur Kevin McGrath

I dedicate this book to Bob Gibson's children and to my niece, Katie Scalzo. Katie and the Gibson kids have a love for life and a dedication to their families that commands the respect and admiration of all of us.

From Noel J. Bergman

I thank my friends and family for putting up with my lack of social time while working on two books, a day job, and involvement with The Apache Software Foundation.

Contents at a Glance

	Acknowledgments	xxi
	About the Authors	xxiii
Chapter 1	Introduction	1
Chapter 2	Jython Fundamentals	5
Chapter 3	Jython Statements	27
Chapter 4	Jython Classes	63
Chapter 5	Jython Modules	87
Chapter 6	wsadmin	113
Chapter 7	Introduction to Admin Objects	129
Chapter 8	The AdminConfig Object	149
Chapter 9	The AdminControl Object	167
Chapter 10	The AdminApp Object	185
Chapter 11	The AdminTask Object—Server Management	199
Chapter 12	Scripting and Security	241
Chapter 13	Databases and Authorization	277
Chapter 14	Messaging	301
Chapter 15	Administering Web Services	345
Chapter 16	Version 7.0 Scripting Libraries	393
	Index	449

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Contents

Acknowledgments	xxi
About the Authors	xxiii
Chapter 1 Introduction	1
Why Is This Book Necessary?	1
About the Websphere Application Server Product	2
This Book and Its Organization	2
Chapter 2 Jython Fundamentals	5
Introduction	6
Data Types	6
Numbers	7
Strings	8
Tuples	11
Lists	12
Accessing Sequence Elements	12
Dictionaries	14
Additional Information Types	15
Literals (Constants)	15
Variables Names (Identifiers)	15
Variables	16
Expressions	18
String Operators	19
Statement Separator	25
Comments	26
Coding Conventions	26
Summary	26

Chapter 3	Jython Statements	27
Expression Statements		27
The print Statement		27
Assignment Statements		28
Packing and Unpacking		30
Augmented Assignment		32
Slices		32
Simple Statements		35
The assert Statement		35
The break Statement		36
The continue Statement		36
The del Statement		36
The exec Statement		38
The import Statement		39
The pass Statement		39
The raise Statement		39
Control Flow		39
Compound Statements		42
The if Statement		42
loop Statements		42
The while Statement		43
The for Statement		44
The try Statement		47
Functions		49
Function Definitions		50
Namespaces		51
The global Statement		51
Function Parameters		53
The return Statement		58
Default Parameter Evaluation		60
Summary		62
Chapter 4	Jython Classes	63
Class Statement		63
Example class Definition		64
Object Instantiation		66
Built-in Constants		66
Built-in Data Types		67
List Methods		67
Dictionary Methods		69
String Methods		71
String Formatting		74
Built-in Functions		77
Summary		86

Chapter 5	Jython Modules	87
	Jython Module Basics	87
	The import Statement	88
	nested_scopes	90
	Packages	92
	Errors and Exceptions	92
	Built-in Exceptions	93
	Functional Programming	94
	Using Java Objects and Libraries	95
	Jython Standard Library	97
	getopt() Module	100
	Regular Expressions (RegExp)	107
	Summary	112
Chapter 6	wsadmin	113
	wsadmin Options	115
	Usage Information	116
	The Java Virtual Machine Initialization Phase	116
	The wsadmin Environment Initialization Phase	116
	The Connection Phase	120
	Defining the Scripting Language	122
	Trace-Related Options	122
	wsadmin Profile Script Files	123
	Commands and Script Files	126
	Interactive/Interpretive wsadmin Session	128
	Summary	128
Chapter 7	Introduction to Admin Objects	129
	The Administrative Scripting Objects	129
	Help for the Help Object	134
	Help for MBeans	136
	Help for MBean Attributes	138
	Help for MBean Operations	140
	Help for Additional MBean Information	142
	Help for Other Administrative Objects	144
	Help for WebSphere Messages	145
	Useful Information	145
	Summary	147
Chapter 8	The AdminConfig Object	149
	AdminConfig Overview	149
	Configuration Identifier (config ID)	150
	Containment Path	151
	Configuration Types	152
	Using a config ID	153

Show and Tell Methods	155
Create and Modify Methods	160
Configuration Verification/Validation	162
Document Manipulation Methods	164
Miscellaneous Methods	164
Summary	165
Chapter 9 The AdminControl Object	167
Environment Information and Manipulation	167
MBean Support Methods	172
Objects, Names, and Instances	173
Attribute-Related Methods	174
Miscellaneous Methods	181
*_jmx Methods	183
Summary	184
Chapter 10 The AdminApp Object	185
Application Informational Methods	185
Application Installation Methods	190
Edit, Update, and Uninstall	194
Miscellaneous AdminApp Methods	196
Summary	198
Chapter 11 The AdminTask Object—Server Management	199
Introduction	199
Simple One-Line Examples	201
ServerType-Related Methods	202
Creating Servers and Clusters	205
Server-Related Commands	209
create*Server Optional and Required Steps	212
Server Template-Related Commands	214
JVM-Related Methods	216
JVM System Properties	217
JVM Properties	218
z/OS-Specific Methods	220
Miscellaneous ServerManagement Methods	220
Reference Section	223
Node Group Command Group and Core Group Command Group	224
createCoreGroup	224
createNodeGroup	224
addNodeGroupMember	224
removeNodeGroupMember	224
removeNodeGroup	225
moveClusterToCoreGroup	225
moveServerToCoreGroup	225
deleteCoreGroup	226

AdminReports Command Group	226
reportConfigInconsistencies	226
ReportConfiguredPorts	226
ClusterConfigCommands Command Group	226
createCluster	226
createClusterMember	228
deleteClusterMember	230
deleteCluster	230
ConfigArchiveOperations Command Group	231
exportServer	231
importServer	231
GenerateSecurityConfigCommand Command Group	232
generateSecConfigReport	232
PortManagement Command Group	232
listApplicationPorts	232
listServerPorts	232
ServerManagement Command Group	233
listServer	233
getServerType	233
listServerTypes	233
showServerInfo	234
showServerTypeInfo	234
createApplicationServer	234
createApplicationServerTemplate	235
deleteServer	236
setJVMProperties	236
setJVMSystemProperties	237
setProcessDefinition	237
Server Management Methods that Do Not Belong to Any Command Group	238
createServerType	238
Summary	239

Chapter 12 Scripting and Security

241

WebSphere Security Basics	241
JAAS (J2C) Aliases	242
Create a J2C (JAAS) Alias	242
Viewing JAAS Aliases	244
Modify a JAAS Alias	245
Delete a JAAS Alias	246
Configuring Application Security	249
Enabling/Disabling Administrative and Application Security	249
Mapping Java EE Roles	250

Review the Current and Available Mappings	251
Mapping Roles to Users and/or Groups	251
Enable/Disable Java 2 Security	253
LDAP Failover	255
Viewing the Hosts	257
Adding Additional LDAP Hosts	258
Setting the Host List	258
Removing LDAP Hosts	259
Federated Registries (and Other Essentially Undocumented Scripting Areas)	260
Multiple Security Domains (WebSphere V7)	261
Additional Security Topics	263
Bus Security	263
Datasources	263
Web Services	264
AdminTask Security Reference	264
SecurityConfigurationCommands Group	264
SecurityDomainCommands Group	270
SecurityRealmInfoCommands	272
WIMManagementCommands	273
WizardCommands	274
JACCUtilityCommands	275
IdMgrRepositoryConfig	275
Chapter 13 Databases and Authorization	277
Database Basics	277
Terminology	278
A Simple Example	278
Troubleshooting Configuration Problems	280
Advanced Settings	284
Databases Reference Section	291
JDBCProviderManagement Group	291
VariableConfiguration Group	294
Useful MBeans	296
Summary	300
Chapter 14 Messaging	301
An Introduction to Messaging	301
Messaging Basics	302
Terminology	303
Example: Creating a Bus	303
Example: Deleting a Bus	308

Security	310
Enabling Bus Security	311
Example: Enabling Bus Access Security	312
Example: Enabling Transport Security	314
Reference Section	317
Creating Message Buses	317
Deleting a Bus and Bus Components	326
Modifying a Bus and Bus Components	329
Displaying Buses and Bus Components	334
Bus Security	337
Summary	344

Chapter 15 Administering Web Services 345

Web Services Basics	346
WS-I Profiles	346
WSDL and SOAP	347
A Web Service Example	348
Web Services Runtimes	351
Managing Web Services	352
Exploring Web Services	353
Listing Web Services	353
Listing Web Services Information	354
Exporting the WSDL for a Web Service	355
Web Service Policy Sets	355
Policy Set Bindings	362
Policy Set Attachment	368
Policy Topics Summary	371
Additional Topics	371
Enable/Disable Endpoints	371
WS-Notification	371
Web Services and the Service Integration Bus	372
Mediations	372
Web Services Gateway	372
Online References	372
AdminTask Web Services Reference	373
SIBWebServices Group	374
KeyManagerCommands	377
KeyStoreCommands	378
KeySetCommands	381
PolicySetManagement Group	382
WebServicesAdmin Group	390

Chapter 16	Version 7.0 Scripting Libraries	393
Library Organization		393
Scripting Library Help		397
Default Failure Action		398
AdminApplication Script Library Module		399
AdminApplication Group 1—Install and Uninstall Applications		400
AdminApplication Group 2—Query Application Configurations		403
AdminApplication Group 3—Update Applications		404
AdminApplication Group 4—Export Applications		406
AdminApplication Group 5—Configure Application Deployment		407
AdminApplication Group 6—Start/Stop Applications		408
Business-Level Applications (AdminBLA)		409
Java 2 Connector (AdminJ2C) Library Module		412
AdminJDBC Library Module		414
AdminJMS Library Module		416
AdminResources Library Module		423
AdminAuthorizations Library Module		428
AdminClusterManagement Library Module		430
AdminServerManagement Library Module		432
AdminServerManagement: Group 1—Server Configuration		433
AdminServerManagement: Group 2—ServerTracingAndLogging Configuration		437
AdminServerManagement: Group 3—OtherServicesConfiguration		439
AdminNodeGroupManagement Library Module		445
AdminNodeManagement Library Module		446
AdminLibHelp and AdminUtilities Library Modules		447
Summary		447
Index		449

Acknowledgments

Although it has been stated before, it bears repeating: Books do not come together without a great deal of time and effort. It is probably a good thing that we don't realize just how much time and effort we are committing to when we first sign up for a task of this size. Nor does a book make it through the process without help and support from an entire community. It is an enormous undertaking, and we could not have done it without a great deal of assistance.

First, we would like to thank IBM for providing its amazing WebSphere Application Server product. It is function-rich and contains so many features that it is difficult for any one person to know all of its capabilities. If it were not an important and valuable product, there would be little need for a book like this.

We would also like to thank our colleagues for their continued support during the time required to pull all of this information together. We would especially like to thank our reviewers who made time in their busy schedules to help make this a better book: Ty Shrake, Bill Holtzhauser, Mike Shenhouse, Rich Montjoy, Peter Neergaard, Peter Jakab, Preston Law, and Gale Botwick.

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About the Authors

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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 Jython¹ 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 documentation²). 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.

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 book⁵ 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.

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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Index

A

abs(x) method, 77

accessing

 dictionaries, 14

 sequence elements, 12-13

addGroupToBusConnector-
Role method, 338

addGroupToDefaultRole
method, 338

addGroupToDestinationRole
method, 338

addGroupToTopicRole
method, 339

addGroupToTopicSpaceRoot-
Role method, 340

adding

 content, 209

 hosts, 258

 libraries, 395

 resources to security

 domains, 262

addNodeGroupMember
command, 224

addPartialAppToAnApp-
WithUpdateCommand()
method, 406

addPolicyType command,
382

addSIBusMember method,
318-320

addSIBWSInboundPort
method, 376

addSIBWSOutboundPort
method, 376

addUpdateSingleModuleFile-
ToAnAppWithUpdate-
Command() method, 405

addUserToBusConnectorRole
method, 338

addUserToDefaultRole
method, 338

addUserToDestinationRole
method, 339

addUserToTopicRole
method, 340

addUserToTopicSpaceRoot-
Role method, 340

AdminApp command, 355

AdminApp object, 199

 application installation

 methods, 204-208

 editing, 208-210

 methods, 199-212

 updating, 208-210

AdminApp.getDeployStatus()
method, 204

AdminApp.isAppReady()
method, 200

AdminApp.updateInteractive(
) method, 208

AdminApplication objects

 AdminAuthorizations

 modules, 428-430

 AdminClusterManagemen-
t modules, 430-432

 AdminJ2C modules,

 412-414

 AdminJDBC modules,

 414-416

 AdminJMS modules,

 416-423

- AdminNodeGroupManagement modules, 445-446
- AdminNodeManagement modules, 446-447
- AdminResources modules, 423-427
- AdminServerManagement modules, 432-445
 - business-level applications, 409-412
 - scripting libraries, 399-409
- AdminApplication.getAppDeploymentTarget() method, 404
- AdminAuthorizations modules, 428-430
- AdminBLA scripting library files, 409-412
- AdminClusterManagement modules, 430-432
- AdminConfig object, 149
 - config ID, 150-155
 - configuration types, 152-153
 - containment paths, 151
 - create/modify methods, 160-162
 - document manipulation methods, 164
 - methods, 164-165
 - overview of, 149-150
 - show/tell methods, 155-159
 - verification, 162-163
- AdminConfig.create() method, 211
- AdminConfig.getid() method, 151
- AdminConfig.hasChanges() method, 162
- AdminConfig.list() method, 152
- AdminConfig.parents() method, 160
- AdminConfig.remove() method, 162
- AdminConfig.reset() method, 352
- AdminConfig.save() method, 352
- AdminConfig.show() method, 153
- AdminConfig.showall() method, 156
- AdminConfig.types() method, 160
- AdminConfig.validate() method, 163
- AdminControl object, 167
 - attributes, 174-181
 - environment information, 167-172
 - MBean support methods, 172-173
 - methods, 181-182
 - methods*_imx, 183-184
 - names, 173-174
- AdminControl.startServer() method, 168
- administration
 - objects, 129-134
 - documentation, 145-147
 - Help, 134-145
 - security, enabling, 249-250
 - Web services, 352
 - exporting WSDL, 355
 - KeyManager commands, 377
 - KeySet commands, 381-382
 - KeyStore commands, 378-381
 - listing, 353-354
 - navigating, 353-355
 - overview, 346-350
 - policy sets, 355-365, 367-371
 - PolicySetManagement group, 382-390
 - references, 373-376
 - runtimes, 351-352
 - SIBWebServices group, 374-377
 - SOAP, 347
 - topics, 371-372
 - WebServicesAdmin group, 390-392
 - WS-I profiles, 346-347
 - WSDL, 347
- wsadmin program, 113-115
 - commands, 126-128
 - connecting, 120
 - defining scripting languages, 122
 - environment initialization, 116-120
 - JVM initialization, 116
 - options, 115
 - profile script files, 123-126
 - tracing, 122
 - usage information, 116
- AdminJ2C modules, 412-414
- AdminJDBC modules, 414-416
- AdminJMS modules, 416-423
- AdminLibHelp module, 447
- AdminNodeGroupManagement modules, 445-446
- AdminNodeManagement modules, 446-447
- AdminReports Command Group command, 226

- AdminResources modules, 423-427
 - AdminServerManagement modules, 432-445
 - AdminTask methods, 145
 - databases. *See* databases
 - security, 264
 - server management, 199-200
 - command, 209-212
 - creating clusters, 205-209
 - examples, 201-202
 - JVM methods, 216-217
 - JVM properties, 218-219
 - JVM system properties, 217-218
 - methods, 202-205
 - references, 223-239
 - template-related
 - commands, 214-216
 - z/OS methods, 220-223
 - AdminTask.listPolicySets() method, 356
 - AdminTask.listServerTypes() method, 203
 - AdminTask.listWebServices-Operations command, 354
 - AdminTask.modifySIB* methods, 312
 - AdminUtilities module, 447
 - advanced settings, databases, 284-291
 - aliases, J2C, 242-249
 - AllAuthenticated group, 311
 - append(item) method, 67
 - applications
 - AdminApp object, 199
 - application installation methods, 204-208
 - editing, 208-210
 - methods, 199-204, 210-212
 - updating, 208-210
 - business-level, 409-412
 - deploying, 407-408
 - exporting, 406
 - Federated registries, 260-261
 - messaging, 301-302
 - creating buses, 303-308
 - deleting buses, 308-310
 - references, 317-327
 - security, 310-317
 - terminology, 303
 - names, 203
 - policy sets, 356
 - security, 241-242
 - configuring, 249-253
 - enabling, 249-250
 - J2C, 242-249
 - Java, 253-255
 - servers, 2
 - starting, 408-409
 - stopping, 408-409
 - updating, 404-406
 - wsadmin program, 113-115
 - commands, 126-128
 - connecting, 120
 - defining scripting languages, 122
 - environment
 - initialization, 116-120
 - JVM initialization, 116
 - options, 115
 - profile script files, 123-126
 - tracing, 122
 - usage information, 116
 - applying config IDs, 153-155
 - arbitrary function parameters, 55-58
 - archive files, 116
 - arithmetic operators, 18
 - assert statements, 35-36
 - assignment statements, 16, 28-30
 - augmented, 32
 - packing/unpacking, 30-31
 - slices, 34
 - attachments, policy sets, 361-371
 - attributes
 - AdminControl object, 174-181
 - MBean Help object, 138-140
 - missing, 155
 - policy, 360
 - RW, 177
 - augmented assignment statements, 32
 - authentication
 - data entry, creating, 244
 - LDAP failover, 255-260
 - authorization
 - AdminAuthorizations
 - library module, 428-430
 - buses, 313
 - databases, 277
 - advanced settings, 284-291
 - overview of, 277-280
 - references, 291-300
 - troubleshooting, 280-284
 - autoloading scriptLibraries, 395
 - availability of objects, 133
- B**
- backslash (\) character, 9
 - beanDescriptions.py, 143
 - beanInformation.py, 144

- bindings
 - assignment statements, 30
 - deleting, 365
 - policy sets, 362-371
 - slices, 32-33
 - bitwise operators, 21
 - Boolean operators, 21
 - break statements, 36
 - Browser security role, 311
 - built-in
 - constants, 66
 - data types, 67
 - exceptions, 93-94
 - functions, 77-86
 - buses
 - creating, 303, 306-308
 - deleting, 308-310, 326
 - messaging, 303
 - modifying, 329
 - security, 263, 311-314, 337
 - viewing, 334
 - business-level applications, 409-412
 - busMembers element, 305
- C**
- callable(object) method, 78
 - capabilities, 1
 - capitalize() method, 71
 - CellStatus.py, 171
 - center(width) method, 71
 - chains, 315
 - changeClusterShortName() method, 220
 - changeServerGenericShortName() method, 220
 - changeServerSpecificShortName() method, 220
 - characters, escape sequences, 9
 - chr(i) method, 78
 - classes
 - hierarchies, 93
 - statements, 63-66
 - ClassNotFoundException, 282
 - clear() method, 69
 - client-side policy
 - attachments, 368
 - cloning security domains, 261
 - clusters
 - AdminClusterManagement library module, 430-432
 - creating, 205-209
 - code conventions, 26
 - commands
 - AdminApp, 355
 - AdminTask.listWebServicesOperations, 354
 - command line options, 117
 - configureSingleSignon, 269
 - copySecurityDomain, 271
 - copySecurityDomainFromGlobalSecurity, 270
 - create, 210
 - createAuthDataEntry, 265
 - createGroup, 273
 - createSecurityDomain, 270
 - createUser, 273
 - deleteAuthDataEntry, 265
 - deleteGroup, 274
 - deleteSecurityDomain, 271
 - deleteUser, 273
 - dir(), 395
 - duplicateMembershipOfGroup, 274
 - duplicateMembershipOfUser, 274
 - getActiveSecuritySettings, 266
 - getSingleSignon, 269
 - getUserRegistryInfo, 269
 - IdMgrRepositoryConfig group, 275-276
 - isAppSecurityEnabled, 275
 - isJACCEnabled, 275
 - isSingleSecurityDomain, 275
 - JACCUtilityCommands group, 275
 - KeyManager, 377
 - KeySet, 381-382
 - KeyStore, 378-381
 - listAuthDataEntries, 265-266
 - listInterceptors, 270
 - listRegistryGroups, 272
 - listSecurityDomains, 271
 - listSecurityRealms, 273
 - manageprofiles, 203
 - SecurityConfiguration-Commands group, 264-270
 - SecurityDomain-Commands group, 270-271
 - SecurityRealmInfo-Commands group, 272-273
 - servers, 209-216
 - serverStatus, 172
 - setAdminActiveSecuritySettings, 266-267
 - setAppActiveSecuritySettings, 267-268
 - setGlobalSecurity, 274
 - unsetAppActiveSecuritySettings, 268-269
 - WIMManagement-Commands group, 273-274
 - WizardCommands group, 274-275
 - wsadmin programs, 126-128
 - comments, 26, 116
 - comparison operators, 22
 - compile(patternString [, flags]) method, 109

- compile(string, filename, kind) method, 78
- complex(real[, imag]) method, 78
- components, buses
 - deleting, 326
 - modifying, 329
 - viewing, 334
- compound statements, 41
 - for, 44-46
 - if, 42
 - loop, 42
 - try, 47-48
 - while, 42-43
- config ID, 150-155, 404, 414, 433, 446
- configureSessionManagementForAnApplication() method, 408
- configureSingleSignon command, 269
- configuring
 - AdminConfig objects, 149-150
 - config ID, 150-155
 - configuration types, 152-153
 - containment paths, 151
 - create/modify methods, 160-162
 - document manipulation methods, 164
 - methods, 164-165
 - show/tell methods, 155-159
 - verification, 162-163
 - applications
 - Java 2 security, 253-255
 - security, 249-253
 - databases, 277-280
 - advanced settings, 284-291
 - references, 291-300
 - troubleshooting, 280-284
 - hosts, 258-259
 - IdMgrRepositoryConfig group, 275-276
 - J2C (JAAS) aliases, 243-244
 - JACCUtilityCommands group, 275
 - messaging, 301-302
 - creating buses, 303-308
 - deleting buses, 308-310
 - references, 317-327
 - security, 310-317
 - terminology, 303
 - permissions, 314
 - policy set bindings, 365
 - SecurityConfiguration-Commands group, 264-270
 - SecurityRealmInfo-Commands group, 272-273
 - servers, 205-209
 - commands, 209-212
 - JVM methods, 216-217
 - JVM properties, 218-219
 - JVM system properties, 217-218
 - references, 223-239
 - template-related commands, 214-216
 - z/OS methods, 220-223
 - SIBs, 307
 - strings, 74-77
 - WIMManagement-Commands group, 273-274
 - WizardCommands group, 274-275
- ConnectionPool, 283
- connections
 - leaks, tracing, 284
 - messages, 121
 - wsadmin program, 120
- Connector security role, 311
- connectSIBWSEndpoint-Listener method, 375
- constants, built-in, 66. *See also* literals, 8-15
- constructors, finding, 142-143
- constructs, OOP, 63
 - built-in
 - constants, 66
 - data types, 67
 - functions, 77-86
 - class statements, 63-66
 - dictionary methods, 69-71
 - instantiation, 66
 - list methods, 67-68
 - string methods, 71-77
- containers, EJB, 351
- containment paths, 151
- content, adding, 209
- continue statements, 36
- control flow, 39-41
- conventions, code, 26
- convertToCluster.py, 164
- copy() method, 69
- copyBinding command, 389
- copying
 - bindings, 363
 - slices, 32-33
- copyPolicySet command, 388
- copySecurityDomain command, 271
- copySecurityDomainFrom-GlobalSecurity command, 270
- count(item) method, 67
- count(substring[, start [, end]]) method, 71

- create commands, 210
 - create() method, 160-162
 - createApplicationServe
 - command, 234
 - createApplicationServer()
 - method, 209
 - createApplicationServer-
 - Template command, 235
 - createApplicationServer-
 - Template() method, 214
 - createAuthDataEntry
 - command, 265
 - createCluster command, 226
 - createClusterMember
 - command, 228
 - createCoreGroup
 - command, 224
 - createDataSource, 292
 - createGenericServer()
 - method, 209
 - createGenericServerTemplate
 - () method, 214
 - createGroup command, 273
 - createJDBCProvider, 291
 - createKeyManager
 - command, 378
 - createKeySet command, 381
 - createKeyStore command, 379
 - createNodeGroup
 - command, 224
 - createPolicySet
 - command, 383
 - createPolicySetAttachment
 - command, 383
 - createProxyServer() method,
 - 204, 209
 - createProxyServerTemplate()
 - method, 214
 - createSecurityDomain
 - command, 270
 - createServerType
 - command, 238
 - createServerType() method,
 - 202-203
 - createSIBDestination
 - method, 320-322
 - createSIBEngine method,
 - 322-323
 - createSIBJMSActivationSpec
 - method, 325-326
 - createSIBJMSConnectionFactory
 - method, 323-324
 - createSIBJMSQueue method,
 - 324-325
 - createSIBJMSTopic method,
 - 325
 - createSIBus method, 317-318
 - createSIBWSEndpoint-
 - Listener method, 375
 - createSIBWSInboundService
 - method, 374
 - createSIBWSOutbound-
 - Service method, 374
 - createUser command, 273
 - createWebServer() method,
 - 209
 - createWebServerTemplate()
 - method, 214
 - Creator security role, 311
 - customizing
 - databases, 284-291
 - J2C (JAAS) aliases, 245
 - references, 291-300
 - wsadmin programs, 115
 - environment
 - initialization, 116-120
 - JVM initialization, 116
 - usage information, 116
- D**
- data definition language
 - (DDL), 406
- data types, 6-7
 - built-in, 67
 - dictionaries, 14
 - lists, 12
 - numbers, 7
- sequences, accessing
 - elements, 12-13
 - strings, 8-11
 - tuples, 11
- databases
 - authorization, 277
 - advanced settings,
 - 284-291
 - references, 291-300
 - troubleshooting,
 - 280-284
 - overview of, 277-280
 - DataSources, 278-280,
 - 296-298
 - security, 263
 - DCS (Distribution and
 - Consistency Services), 315
 - DDL (data definition
 - language), 406
 - default failure actions,
 - scripting libraries, 398
 - default function parameters,
 - 53-62
 - defining scripting
 - languages, 122
 - definitions
 - classes, 66
 - functions, 49-50
 - del statements, 36
 - deleteAuthDataEntry
 - command, 265
 - deleteCluster command, 230
 - deleteClusterMember
 - command, 230
 - deleteCoreGroup
 - command, 226
 - deleteGroup command, 274
 - deletePartialAppToAnApp-
 - WithUpdateCommand()
 - method, 406
 - deleteSecurityDomain
 - command, 271
 - deleteServer command, 236

- deleteServer() method, 210
 - deleteServerTemplate()
 - method, 214
 - deleteSIBDestination
 - method, 328-329
 - deleteSIBJMSActivationSpec
 - method, 327
 - deleteSIBJMSConnectionFactory
 - method, 327
 - deleteSIBJMSQueue
 - method, 327
 - deleteSIBJMSTopic
 - method, 327
 - deleteSIBus
 - method, 327
 - deleteSingleModuleFileToAnAppWithUpdateCommand()
 - method, 405
 - deleteUser
 - command, 273
 - deleteUserAndGroupEntries()
 - method, 210
 - deleteWebServer()
 - method, 210
 - deleting
 - bindings, 365
 - buses, 308-310, 326
 - hosts, 259-260
 - J2C (JAAS) aliases, 246-249
 - servers, 207
 - deploying applications, 407-408
 - destinations, 303
 - dictionaries, 14
 - methods, 69-71
 - parameters, unpacking, 57
 - dir([object])
 - method, 78
 - dir()
 - command, 395
 - directories
 - importing, 395
 - structures, 150
 - disabling security, 249-250
 - Distribution and Consistency Services (DCS), 315
 - divmod(a, b)
 - method, 78
 - documents
 - admin objects, 145-147
 - function strings, 61
 - manipulation methods, 164
 - domains
 - multiple security, 261-262
 - security, adding resources to, 262
 - SecurityDomain-Commands
 - group, 270-271
 - duplicateMembershipOfGroup
 - command, 274
 - duplicateMembershipOfUser
 - command, 274
- E**
- ease-of-use features, 1
 - editing AdminApp
 - methods, 208-210
 - EJB (Enterprise Java Bean), 351
 - elements
 - busMembers, 305
 - sequences, accessing, 12-13
 - email, messaging, 302. *See also* messaging
 - enabling
 - bus security, 311-314
 - Java 2 security, 253-255
 - security, 249-250
 - transport security, 314-317
 - end([group])
 - method, 110
 - endpoints, Web services, 354
 - endsWith(suffix[, start [, end]])
 - method, 71
 - Enterprise Java Bean (EJB), 351
 - environments
 - AdminControl
 - object, 167-172
 - initialization, 116-120
 - errors, 92-94
 - OOM, 86
 - escape sequences, 9
 - escape(string)
 - method, 109
 - eval(expression[, globals[, locals]])
 - method, 79
 - Everyone
 - group, 311
 - exceptions, 92
 - built-in, 93-94
 - ClassNotFoundException, 282
 - IndexError, 68
 - NameError, 132
 - scripting libraries, 399
 - exchangeSigners
 - command, 380
 - exec
 - statements, 38
 - execfile(filename[, globals[, locals]])
 - method, 79
 - expandtabs([tabsize])
 - method, 71
 - export()
 - method, 210
 - exportAllApplicationsToDir()
 - method, 406
 - exportAnAppToFile()
 - method, 406
 - exportBinding
 - command, 389
 - exportDDL()
 - method, 210
 - exporting
 - applications, 406
 - policy sets, 359
 - WSDL, 355
 - exportPolicySet
 - command, 387
 - exportServer
 - command, 231
 - expressions
 - overview of, 18
 - regular *RegExp, 107-112
 - statements, 27-28
 - extend(item)
 - method, 67
 - extracting methods, names, 135

F

failonerror parameters, 399
 failover, LDAP, 255-260
 Federated registries, 260-261
 filenames, 203, 206
 files
 archive, 116
 help, 114
 modules, 87
 errors, 92-94
 import statements, 88-90
 nested_scopes, 90-92
 packages, 92
 profile script, 123-126
 script, 126-128
 script library, 394
 wsadmin.properties, 133
 filter(function, sequence)
 method, 79
 find(substring[, start[, end]])
 method, 71
 findall(pattern, string)
 method, 109
 findall(string [, startPos [, endPos]]) method, 110
 finding constructors, 142-143
 fixFileName() method, 207
 float(x) method, 79
 flow, control, 39-41
 for statements, 44-46
 formatting. *See also*
 configuring
 databases, 277-280
 advanced settings, 284-291
 references, 291-300
 troubleshooting, 280-284
 indentation, 40
 J2C (JAAS) aliases, 243-244
 JVM properties, 218

 messaging, 301-302
 creating buses, 303-308
 deleting buses, 308-310
 references, 317-327
 security, 310-317
 terminology, 303
 servers, 205-209
 commands, 209-212
 JVM methods, 216-217
 JVM properties, 218-219
 JVM system properties, 217-218
 references, 223-239
 template-related
 commands, 214-216
 z/OS methods, 220-223
 strings, 74-77
 functional programming, 94
 functions, 49
 built-in, 77-86
 definitions, 49-50
 global statements, 51-52
 MAttrAsDict() utility, 179
 namespaces, 51
 parameters, 52
 arbitrary, 55-58
 default, 53-62
 named, 54-55
 return statements, 58-59
 showAsDict, 154

G

generateKeyForKeySet
 command, 381
 generateSecConfigReport
 command, 232
 get(key [, defaultValue])
 method, 70
 getActiveSecuritySettings
 command, 266
 getAttr(object, name[,
 default]) method, 80
 getAttribute() method,
 175, 179
 getAttributes() method, 175
 getAttributes_jmx()
 method, 183
 getBinding command, 386
 getDefaultBindings
 command, 387
 getDeployStatus()
 method, 204
 getDmgrProperties()
 method, 220
 getid() method, 152
 getJavaHome() method, 220
 getKeyStoreInfo
 command, 380
 getMBeanCount()
 method, 172
 getObjectNames() method, 165
 getopt() library routine,
 100-102
 getPolicySet command, 385
 getPolicySetAttachments
 command, 386
 getPolicyType command, 385
 getRequiredBindingVersion
 command, 387
 getServerType command, 233
 getServerType() method, 202
 getSingleSignon
 command, 269
 getters, 140
 getUserRegistryInfo
 command, 269
 getWebService method, 392
 global security, 249, 311. *See also* security
 global statements, 51-52
 globals() method, 80
 group([group]) method, 110
 groupdict() method, 110

groups

- AdminNodeGroup
 - Management library module, 445-446
 - IdMgrRepositoryConfig, 275-276
 - JACCUtilityCommands, 275
 - JDBCProviderManagement, 291-293
 - mapping, 251-253
 - PolicySetManagement, 382-390
 - SecurityConfiguration-Commands, 264-270
 - SecurityDomain-Commands, 270-271
 - SecurityRealmInfo-Commands, 272-273
 - ServerManagement, 209
 - SIBWebServices, 374-377
 - VariableConfiguration, 294-296
 - WebServicesAdmin, 390-392
 - WIMManagement-Commands, 273-274
 - WizardCommands, 274-275
- groups() method, 110

H

- hasattr(object, name) method, 80
- hash(object) method, 80
- has_key(key) method, 70
- help files, 114
- Help object, 134-144
- help() method, scripting libraries, 397-399
- Help.constructors() method, 142

Help.descriptions()

- method, 143
- hex(x) method, 80
- hierarchies, classes, 93
- hosts
 - adding, 258
 - configuring, 258-259
 - deleting, 259-260
 - viewing, 257

I

- id(object) method, 80
- identifiers, 15-16
- identity operators, 24
- IdMgrRepositoryConfig group, 275-276
- IEEE Standard for Binary Floating-Point Arithmetic (ANSI/IEEE Std 754-1985), 7
- if statements, 42
- import statements, 39, 88-90
- importBinding command, 388
- importing directories, 395
- importPolicySet command, 387
- importServer command, 231
- *_imx methods, 183-184
- indentation, 40
- index(item) method, 68
- index(substring[, start [, end]]) method, 71
- IndexError exceptions, 68
- indexing sequence elements, 13
- infinite loops, 42
- information types, 15
 - expressions, 18
 - identifiers, 15-16
 - literals, 15
 - statement separators, 25
 - string operators, 19-24
 - variables, 16-18
- initialization
 - environments, 116-120
 - JVM, 116
- input([prompt]) method, 80
- insert(index, item) method, 68
- installing applications, 400-402
- installInteractive() method, 207
- installResourceAdapter() method, 165
- instances, AdminControl objects, 173-174
- instantiation, 66
- int(x[, radix]) method, 81
- Integrated Solutions Console, 251
- integrating SIBs, 307
- interactive wsadmin sessions, 43
- interfaces, JNDI, 211
- invoke() method, 181
- isalnum() method, 71
- isalpha() method, 72
- isAppReady() method, 201
- isAppSecurityEnabled command, 275
- isdigit() method, 72
- isFederated() method, 220
- isinstance(object, classinfo) method, 81
- isJACCEnabled command, 275
- islower() method, 72
- isSingleSecurityDomain command, 275
- isspace() method, 72
- issubclass(class, classinfo) method, 81
- istitle() method, 72
- isupper() method, 72
- items() method, 70

J

J2C (J2EE Connector Architecture), 242-249
 authentication aliases, 278
 library modules, 412-414

JAASAuthData objects, 243, 313

JACCUtilityCommands group, 275

Java, 95-103
 roles, mapping, 250
 security, enabling, 253-255

Java 2 Connector Architecture. *See* J2C

Java Messaging Service (JMS), 307

Java Naming and Directory Interface (JNDI), 211

Java Virtual Machine. *See* JVM

JDBC (Java Database Connector)
 AdminJDBC library modules, 414-416
 providers, 278

JDBCProvider, troubleshooting, 281

JDBCProviderManagement Group methods, 291-293

JMS (Java Messaging Service), 307
 AdminJMS library modules, 416-423

JNDI (Java Naming and Directory Interface), 211

join(sequence) method, 72

JVM (Java Virtual Machine), 6
 initialization, 116
 methods, 216-217
 properties, 218-219
 system properties, 217-218

Jython

coding conventions, 26
 comments, 26
 data types, 6-7
 accessing sequence elements, 12-13
 dictionaries, 14
 lists, 12
 numbers, 7
 strings, 8-11
 tuples, 11

information types, 15
 expressions, 18
 identifiers, 15-16
 literals, 15
 statement separators, 25
 string operators, 19-24
 variables, 16-18

overview of, 6

K

KeyManager commands, 377

keys
 policy sets, 362-363
 properties, 117

keys() method, 70

KeySet commands, Web services, 381-382

KeyStore commands, Web services, 378-381

keytools, 363

keywords, 16, 58

L

languages
 Jython. *See* Jython
 scripting, defining, 122

lastgroup, 111

lastindex, 111

LDAP failover, 255-260

LDAPUserRegistry, 256

leaks, tracing connection, 284

len(s) method, 81

libraries

Java, 95-105
 scripting
 AdminApplication objects, 399-409
 AdminAuthorizations modules, 428-430
 AdminClusterManagement modules, 430-432
 AdminJ2C modules, 412-414
 AdminJDBC modules, 414-416
 AdminJMS modules, 416-423
 AdminNodeGroupManagement modules, 445-446
 AdminNodeManagement modules, 446-447
 AdminResources modules, 423-427
 AdminServerManagement modules, 432-445
 business-level applications, 409-412
 navigating, 393-397
 troubleshooting, 397-399

list(sequence) method, 81

listAllDestinationsWithRoles method, 341

listAllForeignBusesWithRoles method, 341

listAllRolesForGroup method, 341

listAllRolesForUser method, 341

listAllTopicsWithRoles method, 341

listApplicationPorts
 command, 232

listAssetsAttachedToPolicySet
 command, 385

listAttachmentsForPolicySet
 command, 384

listAuthDataEntries
 command, 265-266

listDataSources, 294

listGroupsInBusConnectorRole
 method, 341

listGroupsInDefaultRole
 method, 342

listGroupsInDestinationRole
 method, 342

listGroupsInTopicRole
 method, 342

listGroupsInTopicSpaceRootRole
 method, 342, 344

listInterceptors command, 270

listJDBCProviders, 293

listKeyFileAliases
 command, 380

listKeyManagers
 command, 377

listKeyStores command, 378

listKeyStoreTypes
 command, 378

listModules() method, 201

listPolicySets command, 384

listPolicyTypes
 command, 384

ListPorts.py, 159

listRegistryGroups
 command, 272

lists, 12
 methods, 67-68
 Web services, 352-354

listSecurityDomains
 command, 271

listSecurityRealms
 command, 273

listServer command, 233

listServerPorts
 command, 232

listServers() method, 210

listServerTemplates()
 method, 214

listServerTypes
 command, 233

listServerTypes() method,
 202

listServices method, 392

listSIBEngines method, 335

listSIBJMSQueues
 method, 336

listSIBJMSTopics
 method, 336

listSIBMediations
 method, 337

listSIBuses method, 334

listSIBusMembers
 method, 334

listUsersInBusConnectorRole
 method, 343

listUsersInDefaultRole
 method, 343

listUsersInDestinationRole
 method, 343

listUsersInTopicRole
 method, 343

listWebServiceEndpoints
 method, 391

listWebServiceOperations
 method, 391

listWebServices method, 391

literals, 8-15

ljust(width) method, 73

local mode, 120

local precedence, 51

locals() method, 81

long strings, 8

long(x[, radix]) method, 81

loop statements, 42

lower() method, 73

lstrip() method, 73

M

management. *See also*
 administration
 AdminClusterManagement
 library module,
 430-432
 AdminNodeGroupManagement
 library module,
 445-446
 AdminNodeManagement
 library module, 446-447
 AdminServerManagement
 library module, 432-445
 databases, 277-280
 advanced settings,
 284-291
 references, 291-300
 troubleshooting,
 280-284
 servers, 199-200
 commands, 209-212
 creating clusters,
 205-209
 examples, 201-202
 JVM methods, 216-217
 JVM properties,
 218-219
 JVM system properties,
 217-218
 methods, 202-205
 references, 223-239
 template-related
 commands, 214-216
 z/OS methods, 220-223
 Web services, 352
 exporting WSDL, 355
 KeyManager
 commands, 377
 KeySet commands,
 381-382
 KeyStore commands,
 378-381
 listing, 353-354

- navigating, 353-355
 - overview, 346-350
 - policy sets, 355-371
 - PolicySetManagement
 - group, 382-390
 - references, 373-376
 - runtimes, 351-352
 - SIBWebServices group, 374-377
 - SOAP, 347
 - topics, 371-372
 - WebServicesAdmin
 - group, 390-392
 - WS-I profiles, 346-347
 - WSDL, 347
 - wsadmin program,
 - 113-115
 - commands, 126-128
 - connecting, 120
 - defining scripting
 - languages, 122
 - environment
 - initialization, 116-120
 - JVM initialization, 116
 - options, 115
 - profile script files, 123-126
 - tracing, 122
 - usage information, 116
 - manageprofiles command, 203
 - map(function, sequence, ...)
 - method, 82
 - mapping
 - Java EE roles, 250
 - reviewing, 251
 - users, 251-253
 - match(pattern, string [, flags]) method, 109
 - match(string [, startPos [, endPos]]) method, 110
 - max(sequence) method, 82
 - MBatrAsDict() utility
 - function, 179
 - MBeans, 296
 - AdminControl object
 - support methods, 172-173
 - DataSource, 296-298
 - Help object, 136-144
 - TraceService, 298-300
 - MDBs (Message-Driven Beans), 352
 - members, bus, 303
 - membership operators, 24
 - memory, OOM errors, 86
 - Message-Driven Beans (MDBs), 352
 - messaging
 - buses
 - creating, 303-308
 - deleting, 308-310
 - connections, 121
 - Help object, 145
 - overview, 301-302
 - references, 317-344
 - security, 310-317
 - terminology, 303
 - methods
 - addGroupToBusConnectorRole, 338
 - addGroupToDefaultRole, 338
 - addGroupToDestinationRole, 338
 - addGroupToTopicRole, 339
 - addGroupToTopicSpaceRootRole, 340
 - addUserToBusConnectorRole, 338
 - addUserToDefaultRole, 338
 - addUserToDestinationRole, 339
 - addUserToTopicRole, 340
 - addUserToTopicSpaceRootRole, 340
- AdminApp object,
 - 200-212
 - application installation
 - methods, 204-208
 - editing, 208-210
 - updating, 208-210
 - AdminApp.getDeployStatus(), 204
 - AdminApp.isAppReady(), 200
 - AdminApp.updateInteractive(), 208
 - AdminApplication.getAppDeploymentTarget(), 404
- AdminConfig object,
 - 164-165
- AdminConfig.create(), 211
- AdminConfig.getid(), 151
- AdminConfig.list(), 152
- AdminConfig.parents(), 160
- AdminConfig.remove(), 162
- AdminConfig.reset(), 352
- AdminConfig.save(), 352
- AdminConfig.show, 153
- AdminConfig.showall(), 156
- AdminConfig.types(), 160
- AdminConfig.validate(), 163
- AdminControl objects,
 - 181-182
 - *_imx, 183-184
 - MBean, 172-173
- AdminControl.startServer(), 168
- AdminTask, 264
- AdminTask.listPolicySets(), 356
- create(), 160-162
- createSIBDestination, 320-322
- createSIBEngine, 322-323

- createSIBJMSActivationSpec, 325-326
- createSIBJMSConnectionFactory, 323-324
- createSIBJMSQueue, 324-325
- createSIBJMSTopic, 325
- createSIBBus, 317-318
- deleteSIBDestination, 328-329
- deleteSIBJMSActivationSpec, 327
- deleteSIBJMSConnectionFactory, 327
- deleteSIBJMSQueue, 327
- deleteSIBJMSTopic, 327
- deleteSIBBus, 327
- deleteUserAndGroupEntries(), 210
- dictionary, 69-71
- export(), 210
- exportDDL(), 210
- fixFileName(), 207
- getAttribute(), 175-179
- getAttributes(), 175
- getAttributes_jmx(), 183
- getDeployStatus(), 204
- getid(), 152
- getMBeanCount(), 172
- getObjectName(), 165
- Help object, 136
- help(), scripting libraries, 397-399
- Help.constructors(), 142
- Help.descriptions(), 143
- installInteractive(), 207
- installResourceAdapter(), 165
- invoke(), 181
- isAppReady(), 201
- JDBCProviderManagement Group, 291-293
- JVM, 216-217
- listAllDestinationsWithRoles, 341
- listAllForeignBusesWithRoles, 341
- listAllRolesForGroup, 341
- listAllRolesForUser, 341
- listAllTopicsWithRoles, 341
- listGroupsInBusConnectorRole, 341
- listGroupsInDefaultRole, 342
- listGroupsInDestinationRole, 342
- listGroupsInTopicRole, 342
- listGroupsInTopicSpaceRootRole, 342-344
- listModules(), 201
- lists, 67-68
- listSIBEngines, 335
- listSIBJMSQueues, 336
- listSIBJMSTopics, 336
- listSIBMediations, 337
- listSIBuses, 334
- listSIBBusMembers, 334
- listUsersInBusConnectorRole, 343
- listUsersInDefaultRole, 343
- listUsersInDestinationRole, 343
- listUsersInTopicRole, 343
- modify(), 160-162
- modifySIBDestination, 330-331
- modifySIBEngine, 330
- modifySIBJMSQueue, 332
- modifySIBJMSTopic, 333
- modifySIBBus, 329
- names, extracting, 135
- options(), 203
- publishWSDL(), 211
- queryNames(), 174
- removeDefaultRoles, 337
- removeGroupFromAllRoles, 337
- removeSIBBusMember, 328
- removeUserFromAllRoles, 337
- removeVariable, 296
- restart(), 182
- searchJNDIReferences(), 211
- servers, 202-205
- setAttributes(), 179-180
- setAttributes_jmx(), 184
- setVariable, 295
- show(), 155-159
- showAsDict(), 157
- showSIBEngine, 336
- showSIBJMSConnectionFactory, 336
- showSIBJMSQueue, 336
- showSIBJMSTopic, 336
- showSIBMediation, 337
- showSIBBus, 334
- showSIBBusMember, 335
- showVariables, 294
- startServer(), 169
- stopServer(), 169
- strings, 71-77
- tell(), 155-159
- uninstall(), 208
- uninstallResourceAdapter(), 165
- updateAccessIDs(), 212
- updateInteractive(), 209
- VariableConfiguration Group, 294-296
- view(), 203
- z/OS, 220-223
- min(sequence) method, 82
- missing attributes, 155
- modes, local, 120
- modify() method, 160-162

modifying

- AdminControl objects, 167-172
- buses, 329
- configuration, 150
- J2C (JAAS) aliases, 245
- runtime behavior, 283
- security domains, 261

 modifyKeySet command, 382

 modifySIBDestination method, 330-331

 modifySIBEngine method, 330

 modifySIBJMSQueue method, 332

 modifySIBJMSTopic method, 333

 modifySIBus method, 329

 modules

- AdminApplication script library, 399-409
- AdminAuthorizations, 428-430
- AdminClusterManagement, 430-432
- AdminJ2C, 412-414
- AdminJDBC, 414-416
- AdminJMS, 416-423
- AdminLibHelp, 447
- AdminNodeGroupManagement, 445-446
- AdminNodeManagement, 446-447
- AdminResources, 423-427
- AdminServerManagement, 432-445
- AdminUtilities, 447

 errors, 92-94

 import statements, 88-90

 names, 203

 namespaces, 124

 nested_scopes, 90-92

 overview, 87

packages, 92

- simple, 129
- sys, 98-99

 moduleTest.py, 131

 moveClusterToCoreGroup command, 225

 moveServerToCoreGroup command, 225

 multiple security domains, 261-262

N

named function parameters, 54-55

 NameError exception, 132

 names

- AdminControl object, 173-174
- applications, 203
- filenames, 203
- JNDI, 211
- methods, extracting, 135
- modules, 203
- variables, 15-16

 namespaces, 51

- modules, 124
- wsadmin, 123

 navigating

- J2C (JAAS) aliases, 244-245
- LDAPUserRegistry, 256
- scripting libraries, 393-397
- Web services, 353-355

 negative indexes, 13

 nested_scopes, 90-92

 nodes

- AdminNodeGroupManagement library module, 445-446
- AdminNodeManagement library module, 446-447

 numbers, 7

O

object-oriented programming. *See* OOP

 objects

- AdminApp, 199
 - application installation methods, 204-208
 - editing, 208-210
 - methods, 199-212
 - updating, 208-210
- AdminApplication, 399-409
- AdminConfig, 149
 - config ID, 150-155
 - configuration types, 152-153
 - containment paths, 151
 - create/modify methods, 160-162
 - document manipulation methods, 164
 - methods, 164-165
 - overview of, 149-150
 - show/tell methods, 155-159
 - verification, 162-163
- AdminControl, 167
 - attributes, 174-181
 - environment information, 167-172
 - *_imx methods, 183-184
 - MBean support methods, 172-173
 - methods, 181-182
 - names, 173-174

 administration, 129-134

- documentation, 145-147
- Help, 134-145

 availability, 133

 dictionary, 69-71

 instantiation, 66

- Java, 95-105
 - lists, 67-68
 - modules, 87
 - errors, 92-94
 - import statements, 88-90
 - nested_scopes, 90-92
 - packages, 92
 - Security, 278
 - strings, 71-77
 - target, 210
 - OOM (out of memory)
 - errors, 86
 - OOP (object-oriented programming), 63
 - built-in
 - constants, 66
 - data types, 67
 - functions, 77-86
 - class statements, 63-66
 - dictionary methods, 69-71
 - instantiation, 66
 - list methods, 67-68
 - string methods, 71-77
 - open(filename[, mode[, bufsize]]) method, 82
 - operations
 - AdminApp object, 199
 - application installation
 - methods, 204-208
 - editing, 208-210
 - methods, 199-212
 - updating, 208-210
 - AdminConfig object, 149-150
 - config ID, 150-155
 - configuration types, 152-153
 - containment paths, 151
 - create/modify methods, 160-162
 - document manipulation
 - methods, 164
 - methods, 164-165
 - show/tell methods, 155-159
 - verification, 162-163
 - filenames, 203
 - MBean Help objects, 140-141
 - Web services, 355
 - operators
 - arithmetic, 18
 - augmented assignment
 - statements, 32
 - bitwise, 21
 - Boolean, 21
 - comparison, 22
 - identity, 24
 - membership, 24
 - relationships, 22
 - strings, 19-24
 - unary, 21
 - options
 - command line, 117, 284-294
 - wsadmin program, 115
 - environment
 - initialization, 116-120
 - JVM initialization, 116
 - usage information, 116
 - options() method, 203
 - ord(c) method, 82
 - out of memory (OOM)
 - errors, 86
- P**
- packages, 92
 - packing assignment
 - statements, 30-31
 - parameters
 - failon error, 399
 - functions, 52
 - arbitrary, 55-58
 - default, 53-62
 - named, 54-55
 - scripts, 127
 - sequences, unpacking, 56
 - ParentTypes.py, 161
 - parmTest() method, 103-104
 - parseOpt() method, 104-106
 - pass statements, 39
 - passing filenames to
 - scripts, 206
 - paths, containment, 151
 - period (.), 63
 - permissions, configuring, 314
 - ping, 348-350
 - PingServiceJAXRPCApplication, 353
 - POJO (Plain Old Java Object), 351
 - policy sets, Web services, 355-365, 367-371
 - PolicySetManagement group, 382-390
 - pop([index]) method, 68
 - pos, 111
 - pow(x, y[, z]) method, 82
 - precedence
 - local, 51
 - operators, 20, 24
 - print statement, 27-28
 - processing command line
 - options, 100-102
 - profiles
 - script files, 123-126
 - WS-I, 346-347
 - programming
 - functional, 94
 - Jython
 - accessing sequence
 - elements, 12-13
 - coding conventions, 26
 - comments, 26
 - data types, 6-7
 - dictionaries, 14
 - expressions, 18
 - identifiers, 15-16

- information types, 15
 - lists, 12
 - literals, 15
 - numbers, 7
 - operators, 19-24
 - overview of, 6
 - statement separators, 25
 - strings, 8-11
 - tuples, 11
 - variables, 16-18
 - OOP, 63
 - built-in constants, 66
 - built-in data types, 67
 - built-in functions, 77-86
 - class statements, 63-66
 - dictionary methods, 69-71
 - instantiation, 66
 - list methods, 67-68
 - string methods, 71-77
 - programs
 - wsadmin, 113-115
 - commands, 126-128
 - connecting, 120
 - defining scripting languages, 122
 - environment initialization, 116-120
 - JVM initialization, 116
 - options, 115
 - profile script files, 123-126
 - tracing, 122
 - usage information, 116
 - properties, 121
 - JVM, 217-223
 - keys, 117
 - profileToDict() method, 95
 - publishSIBWSInboundService method, 377
 - publishWSDL() method, 211
- Q**
- QOS (Qualities of Service), 355
 - query application configurations, 403-404
 - queryNames() method, 174
 - queues, messaging
 - creating buses, 303-308
 - deleting buses, 308-310
 - security, 310-317
- R**
- RAD (Rational Application Developer) tool, 361
 - raise statements, 39
 - range([start,] stop[, step]) method, 82
 - Rational Application Developer (RAD) tool, 361
 - raw strings, 11
 - raw_input([prompt]) method, 83
 - re (regular repression) function, 111
 - Receiver security role, 311
 - reduce(function, sequence[, initialValue]) method, 83
 - references
 - databases, 291-300
 - messaging, 317-344
 - servers, 223-239
 - Web services, 373-376
 - registries, Federated, 260-261
 - regular expressions (RegExp), 107-112, 135, 157
 - relationship operators, 22
 - reload(module) method, 84
 - remove(index) method, 68
 - removeDefaultRoles method, 337
 - removeGroupFromAllRoles method, 337
 - removeNodeGroup command, 225
 - removeNodeGroupMember command, 224
 - removeSIBusMember method, 328
 - removeUserFromAllRoles method, 337
 - removeVariable method, 296
 - replace(old, new[, count]) method, 73
 - reportConfigInconsistencies command, 226
 - ReportConfiguredPorts command, 226
 - repr(object) method, 84
 - resources, AdminResources library module, 423-427
 - restart() method, 182
 - return statement, 58-59
 - reverse() method, 68
 - reviewing mappings, 251
 - rfind(substring[,start [,end]]) method, 73
 - rindex(substring[, start[, end]]) method, 73
 - rjust(width) method, 73
 - RMI/IIOP connections, 121
 - roles
 - Java, 250
 - mapping, 251-253
 - security, 311
 - round(x[, digits]) method, 84
 - rstrip() method, 73
 - runtimes
 - behavior, modifying, 283
 - Web services, 351-352
 - RW attributes, 177

S

- scope, nested_scopes, 90-92
- scripting
 - administration objects, 129-134
 - documentation, 145-147
 - Help, 134-145
 - functional programming, 94
 - languages, defining, 122
 - libraries
 - AdminApplication objects, 399-409
 - AdminAuthorizations modules, 428-430
 - AdminClusterManagement modules, 430-432
 - AdminJ2C modules, 412-414
 - AdminJDBC modules, 414-416
 - AdminJMS modules, 416-423
 - AdminNodeGroupManagement modules, 445-446
 - AdminNodeManagement modules, 446-447
 - AdminResources modules, 423-427
 - AdminServerManagement modules, 432-445
 - business-level
 - applications, 409-412
 - navigating, 393-397
 - troubleshooting, 397-399
 - profile script files, 123-126
 - support for, 1
 - troubleshooting, 92-94
 - wsadmin program
 - commands, 126-128
 - scripts
 - filenames, passing, 206
 - Jython, 6. *See also* Jython
 - search(pattern, string [, flags]) method, 109
 - search(string [, startPos [, endPos]]) method, 110
 - searching chains, 315
 - searchJNDIReferences() method, 211
 - SecureConversation policy set, 357
 - security
 - AdminTasks methods, 264
 - applications, configuring, 249-253
 - bus, 263
 - buses, 337
 - datasources, 263
 - Federated registries, 260-261
 - J2C, 242-249
 - Java, enabling, 253-255
 - LDAP failover, 255-260
 - messaging, 310-317
 - multiple domains, 261-262
 - overview of, 241-242
 - Web services, 264
 - Security object, 278
 - SecurityConfiguration-Commands group, 264-270
 - SecurityDomainCommands group, 270-271
 - SecurityRealmInfo-Commands group, 272-273
 - Sender security role, 311
 - separator statements, 25
- sequences
 - elements, accessing, 12-13
 - escape, 9
 - parameters, unpacking, 56
 - slices, 32-33
 - tuples, 11
 - unpacking, 31
- server-side policy attachments, 368
- ServerManagement group, 209
- servers
 - AdminServerManagement library module, 432-445
 - applications, 2
 - deleting, 207
 - LDAP failover, 255-260
 - management
 - commands, 209-212
 - creating clusters, 205-209
 - examples, 201-202
 - JVM methods, 216-217
 - JVM properties, 218-219
 - JVM system properties, 217-218
 - methods, 202-205
 - references, 223-239
 - template-related
 - commands, 214-216
 - z/OS methods, 220-223
 - management, 199-200
 - security, 241-242
 - applications, 249-253
 - J2C, 242-249
 - Java, 253-255
- serverStatus command, 172
- ServerTypes methods, 202-205
- service integration buses (SIBs), 307
- services, Web. *See* Web services

- sessions, wsadmin programs, 128
- setAdminActiveSecuritySettings command, 266-267
- setAppActiveSecuritySettings command, 267-268
- setattr(object, name, value) method, 85
- setAttributes() method, 179-180
- setAttributes_jmx() method, 184
- setBinding command, 390
- setDefault(key [, defaultValue]) method, 70
- setGlobalSecurity command, 274
- setJVMProperties command, 236
- setJVMProperties() method, 219
- setJVMSystemProperties command, 237
- setProcessDefinition command, 237
- setProcessDefinition() method, 220-222
- setServerInstance() method, 220
- setters, 140
- setTraceSpecification() method, 220
- setVariable method, 295
- show() method, 155-159
- showAsDict function, 154
- showAsDict() method, 157
- showJVMProperties() method, 219
- showProcessDefinition() method, 220-222
- showServerInfo command, 234
- showServerInfo() method, 210
- showServerInstance() method, 210
- showServerTypeInfo command, 234
- showServerTypeInfo() method, 202
- showSIBEngine method, 336
- showSIBJMSConnectionFactory method, 336
- showSIBJMSQueue method, 336
- showSIBJMSTopic method, 336
- showSIBMediation method, 337
- showSIBus method, 334
- showSIBusMember method, 335
- showTemplateInfo() method, 214-215
- showVariables method, 294
- SIBs (service integration buses), 307
- SIBWebServices group, 374-377
- simple modules, 129
- simple statements, 35
 - assert, 35-36
 - break, 36
 - continue, 36
 - control flow, 39-41
 - del, 36
 - exec, 38
 - import, 39
 - pass, 39
 - raise, 39
 - return, 58-59
- SmartCellStop.py, 170
- SOAP, 121, 347
- span([group]) method, 111
- specifying multiple commands, 126
- split(pattern, string [, maxsplit]) method, 109
- split(string [, maxsplit]) method, 110
- split([separator [,maxsplit]]) method, 73
- splitlines([keepends]) method, 73
- square brackets ([]), 153, 157
- start([group]) method, 110
- startApplicationOnSingleServer() method, 408
- starting applications, 408-409
- startServer() method, 169
- startswith(prefix[, start[, end]]) method, 73
- Stateless Session Beans, 352
- statements
 - assignment, 16, 28-30
 - augmented, 32
 - packing/unpacking, 30-31
 - slices, 34
- class, 63-66
- comments, 116
- compound, 41
 - for, 44-46
 - if, 42
 - loop, 42
 - try, 47-48
 - while, 42-43
- expressions, 27-28
- global, 51-52
- import, 88-90
- return, 58-59
- separators, 25
- simple, 35
 - assert, 35-36
 - break, 36
 - continue, 36
 - control flow, 39-41
 - del, 36
 - exec, 38
 - import, 39
 - pass, 39
 - raise, 39

StopCell.py, 170
 stopping applications, 408-409
 stopServer() method, 169
 __str__() method, 93
 str (object) method, 85
 strings, 8-11
 functions, 111
 long, 8
 methods, 71-77
 operators, 19-24
 raw, 11
 triple-quoted, 8
 strip() method, 74
 sub(pattern, replacement, string [, count]) method, 110
 sub(replacement, string [, count]) method, 110
 subn(pattern, replacement, string [, count]) method, 110
 subn(replacement, string [, count]) method, 110
 swapcase() method, 74
 syntax errors, 92-94
 sys module, 98-99
 dictionary, 131
 sys.path variable, 394

T

target objects, 210
 tell() method, 155-159
 TemplateInfo.py, 215
 template servers, 214-216
 testing, 169
 title() method, 74
 tools
 keytools, 363
 RAD, 361
 topics, policy, 371-372
 TraceService, MBeans, 298-300

tracing
 connection leaks, 284
 wsadmin programs, 122
 transport security, enabling, 314-317
 triple-quoted strings, 8
 troubleshooting, 92-94
 databases, 280-284
 OOM errors, 86
 scripting libraries, 397-399
 try statements, 47-48
 tuples, 11, 31
 type(object) method, 85
 types
 configuration, 152-153
 data, 6-7
 accessing sequence elements, 12-13
 dictionaries, 14
 lists, 12
 numbers, 7
 strings, 8-11
 tuples, 11
 information, 15
 expressions, 18
 identifiers, 15-16
 literals, 15
 statement separators, 25
 string operators, 19-24
 variables, 16-18
 policy, 359

U

unary operators, 21
 unichr(i) method, 85
 unicode(object[, encoding [, errors]]) method, 85
 uninstall() method, 208
 uninstalling applications, 400-402
 uninstallResourceAdapter() method, 165

unpacking
 assignment statements, 30-31
 sequence parameters, 56
 unsetAppActiveSecurity-Settings command, 268-269
 update(dict) method, 71
 updateAccessIDs()
 method, 212
 updateEntireAppToAnApp-WithUpdateCommand()
 method, 406
 updateInteractive()
 method, 209
 updating
 AdminApp methods, 208-210
 applications, 404-406
 upper() method, 74
 usage information, wsadmin programs, 116
 usage() method, 102-103
 users, mappings, 251-253

V

validatePolicySet
 command, 388
 validation, configuring, 162-163
 values, 59
 values() method, 71
 van Rossum, Guido, 61
 VariableConfiguration
 command group, 282
 VariableConfiguration Group
 methods, 294-296
 variables
 names, 15-16
 overview of, 16-18
 slices, 32-33
 sys.path, 394
 VariableSubstitutionEntry, 281

vars([object]) method, 86
 verifying configurations,
 162-163
 view() method, 203
 viewing
 buses, 334
 hosts, 257
 J2C (JAAS) aliases,
 244-245

W

WAuJ.py, 133
 Web services
 KeyManager commands,
 377
 KeySet commands,
 381-382
 KeyStore commands,
 378-381
 listing, 353-354
 managing, 352
 navigating, 353-355
 overview, 346-350
 policy sets, 355-371
 PolicySetManagement
 group, 382-390
 references, 373-376
 runtimes, 351-352
 security, 264
 SIBWebServices group,
 374-377
 SOAP, 347
 topics, 371-372
 WebServicesAdmin group,
 390-392
 WS-I profiles, 346-347
 WSDL, 347, 355
 Web Services Definition
 Language. *See* WSDL
 WebServicesAdmin group,
 390-392

Websphere Application
 Server, overview of, 2
 WebSphere Control Program
 (WSCP), 6
 while statements, 42-43
 WIMManagementCommands
 group, 273-274
 WizardCommands group,
 274-275
 WS-I profiles, 346-347
 wsadmin program, 113-115.
 See also administration
 commands, 126-128
 connecting, 120
 options, 115
 environment
 initialization, 116-120
 JVM initialization, 116
 usage information, 116
 profile script files,
 123-126
 scripting language, 122
 sessions, 43
 tracing, 122
 wsadmin.properties file, 133
 WSASubjects.py, 131-132
 WSCP (WebSphere Control
 Program), 6
 WSDL (Web Services
 Definition Language),
 211, 347
 exporting, 355
 WSSecurity policy set, 358

X-Z

xrange([start,] stop[, step])
 method, 86
 z/OS methods, 220-223
 zfill (width) method, 74