

Contents

<i>About the Author</i>	<i>xi</i>
<i>About the Technical Reviewers</i>	<i>xiii</i>
<i>Acknowledgments</i>	<i>xv</i>
<i>Introduction</i>	<i>xvii</i>
Chapter 1 Basic Concepts in JDO	1
<i>The Persistence Services of JDO</i>	<i>3</i>
<i>Managed and Unmanaged Objects</i>	<i>7</i>
<i>The Ten Management States of Data Objects</i>	<i>17</i>
<i>Identity and the Uniqueness Requirement</i>	<i>21</i>
<i>Summary</i>	<i>36</i>
Chapter 2 Queries	37
<i>The Extent Interface</i>	<i>37</i>
<i>The Design of JDO's Query Service</i>	<i>41</i>
<i>The Query Interface</i>	<i>41</i>
<i>Factory Methods That Produce Query Objects</i>	<i>48</i>
<i>The Syntax of the JDO Query Filter</i>	<i>49</i>
<i>Query Variables</i>	<i>55</i>
<i>Ordering Results</i>	<i>60</i>
<i>Using or Ignoring the Cache in a Query</i>	<i>62</i>
<i>SQL Queries That Can Be Mapped to JDOQL</i>	<i>64</i>
<i>Using SQL When JDOQL Is Not Sufficient</i>	<i>71</i>
<i>How JDO and JDOQL Help the Development Process</i>	<i>72</i>
<i>Summary</i>	<i>73</i>

Chapter 3 The Persistence Manager	75
The Handling of null Values in Method Parameters	76
Obtaining and Closing a Persistence Manager	77
Controlling JDO's Management of Data Objects	78
Controlling the Cache	89
Getting and Constructing Identity Objects	95
Fetching an Application Data Object by Identity	97
Factory Methods in the Persistence Manager	98
Getting the Persistence Manager's Transaction	98
The Properties of a Persistence Manager	99
Summary	101
 Chapter 4 Transactions and Caching	 103
Transactions	104
JDO's Transaction Interface	108
How the Transactional Properties	
Control State Transitions	122
The Optional Transient-Transactional Feature	133
JCA, JTA, and JDO Transactions	135
JDO's Cache of Persistent Objects and Their State	137
Summary	141
 Chapter 5 Enhanced Classes and Managed Fields	 143
Which Application Classes Should Be Enhanced?	143
Managed and Unmanaged Fields	144
Enhancement	148
The JDO Metadata	166
Summary	182
 Chapter 6 Factories That Produce	
Persistence Managers	185
The PersistenceManagerFactory Interface	185
Obtaining a Persistence Manager	186
Obtaining a Persistence Manager Factory	188
Closing a Persistence Manager Factory	194
Obtaining a Connection Factory	195
Examining a JDO Implementation	195

Configuring a Persistence Manager Factory	198
Configuring Connections to the Datastore	198
JDO's Support for Container-Managed Transactions	199
JDO's Support for Bean-Managed Transactions	201
Using JDO in CMT Session Beans	201
On Returning Serialized Data Objects from Business Methods	208
Using JDO in Entity Beans with BMP	209
Using JDO in BMT Session Beans	220
Using JDO in Message-Driven Beans	225
Summary	225
 Chapter 7 Helpers, Callbacks, and Exceptions	227
The JDOHelper Utility Class	227
The InstanceCallbacks Interface	234
The Exceptions of JDO	249
Summary	267
 Chapter 8 Using JDO to Learn More	269
The Ant Build Scripts	270
Getting Started	271
Hello, JDO!	276
Interrogating the PersistenceManagerFactory	278
Consuming Java at the MegaCups Company	280
The Console User Interface	283
Querying the Small Town Library	284
Monitoring the State of Persistent Apples	289
Using the Commercial Implementations	298
Summary	300
 Chapter 9 Using JDO in a Swing Application	301
Building the Rental Swing Application	301
Requirements for the Prototype Reservation System	302
Testing the Rental Swing Client	306
Encountering Conflicting Changes in the Rental Swing Client	308
Designing the Rental Swing Application	310
Summary	319

Chapter 10 Using JDO in a Web Application	321
Configuring the Build Environment for Tomcat	321
Building the Rental Web Application	323
Using the Rental Web Application	325
General Design Issues for Web Applications	332
The MVC Pattern in the Rental Web Application	333
Designing the Use of JDO in a Web Application	334
The One-PM-per-Request Design	339
The One-PM-per-Session Design	354
The One-PM-per-Update Design	355
Summary	357
 Chapter 11 Using JDO in Enterprise JavaBeans	 359
Configuring the Build Environment for JBoss	360
Building the Rental Enterprise Application	365
Design of the Rental Enterprise Application	367
Using JDO with Other Types of EJBs	373
Summary	375
 Glossary	 377
 Appendix Large UML Diagrams	 387
 Index	 403