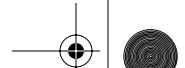


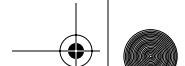
Index

- : (colon), in XML markup, 43, 47
- . (period)
 - JSP operator, 491–492
 - in XML markup, 43
- & (ampersand)
 - entity for, 49
 - SAX processing, 127
 - && (ampersands), JSP operator, 494
- ' (apostrophe), entity for, 49
- * (asterisk)
 - DTD qualifier, 53
 - JSP operator, 494
 - XPath operator, 253
 - XPath wildcard, 252
- @* (at sign, asterisk), XPath wildcard, 252
- = (equal sign), XPath operator, 253
- == (equal signs), JSP operator, 494
- ! (exclamation point), JSP operator, 494
- != (exclamation point, equal sign)
 - JSP operator, 494
 - XPath operator, 253
- > (greater than)
 - entity for, 49
 - JSP operator, 494
 - XPath operator, 253
- >= (greater than, equal)
 - JSP operator, 494
 - XPath operator, 253
- # (hash mark), in character references, 50
- (hyphen), in XML markup, 43
- < (less than)
 - entity for, 49
 - JSP operator, 494
- SAX processing, 127
- XPath operator, 253
- <= (less than, equal)
 - JSP operator, 494
 - XPath operator, 253
- <!...> (less than, exclamation point), in DTDs, 53
- <?...?> (less than, question mark), in XML markup, 34–35
- <...> (less than...greater than), in XML markup, 31
- (minus sign)
 - JSP operator, 494
 - XPath operator, 253
- % (percent sign)
 - in entity names, 67
 - JSP operator, 494
- + (plus sign)
 - DTD qualifier, 53
 - JSP operator, 494
 - XPath operator, 253
- ? (question mark), DTD qualifier, 53
- " (quote), entity for, 49
- / (slash), JSP operator, 494
- _ (underscore)
 - Java localization classes, 819
 - in XML markup, 43
- | (vertical line)
 - in DTDs, 54
 - XPath operator, 253
- || (vertical lines), JSP operator, 494
- [] (square brackets)
 - JSP operators, 491–492
 - XPath pattern matching, 250

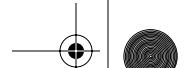
**A**

Abstract document model, 248
Abstract schemas, 835
 container-managed persistence, 835–836
 defined, 1016
 definition, 1016, 1365
 deployment descriptors, 835
 deploytool, 978
 EJB QL, 1015
 hidden from clients, 840
 name, 1001, 1365
 names, 1016
 naming conventions, 847
 type, 1016
 types, 1016
Access control. *See also* SOAP.
 anonymous access, 1088, 1365
 CMP example, 942–943
 databases, 21, 100–104, 446–447
 definition, 1365
 entity beans, 844–845
 JavaServer Faces components, 815–816
 JTree child nodes, 217
 security
 unauthenticated access, 1145
 unrestricted access, allowing, 1094
 session beans, 844–845
 Web-tier security, 1094
 XML registry, 394–395
Access methods
 examples, 949, 976
 local interfaces, 947
 persistent fields, 836, 943
 primary keys, 983
 relationship fields, 836, 943
ACID, 1365
acknowledge method, 1194
Action events, 652–653, 655, 657, 686, 711, 747
 ActionEvent class, 685–686, 712, 747, 749, 757, 768, 775, 789
 actionListener attribute, 657, 685, 711, 719–721, 749, 763, 768, 775, 789
ActionListener class, 668, 711, 747

ActionListener implementation, 749
actionListener tag, 678, 710–712, 763
ActionSource interface, 721
processAction(ActionEvent)
 method, 749
referencing methods that handle action events, 721, 757
writing a backing-bean method to handle action events, 757
ActionEvent, 721, 749, 757
ActionListener, registering, 711–712
ActionListener class, 749–750
ActionSource interface, 646
Activation, 1365. *See also* passivation.
AdapterNode class, 195–200
Adapters, 195
addChildElement method, 349
addClassifications method, 406
addExternalLink method, 413
Address book, exporting, 265
Addressing XPath, 249–250, 251, 252
addServiceBindings method, 407
addServices method, 407
addTextNode method, 349
Admin Console, 26. *See also* Application Server.
 debugging, enabling, 29
 definition, 26
 deploying Web modules, 90, 91
 log viewer, opening, 29
 server log, viewing, 29
 starting, 27
 target server, changing, 1112
 users, adding to Application Server, 1089
Administered objects, 1163
 creating, 1007–1008, 1178–1180
 definition, 1158
 in J2EE applications, 1213
 J2EE applications and, 1213
 for multiple systems, 1188–1189
 programming model, 1158, 1163
 removing, 1009
 synchronous message receives, 1178–1180
Administration servers, 25

**INDEX****1407**

- Advertising a service, 1259–1263
`afterBegin` method, 1052
`afterCompletion` method, 1052–1053
Aggregate functions, 1042–1043
Aliases, Web components, 96–97
`&`, ampersand entity, 49
Ampersand (`&`)
 entity for, 49
 SAX processing, 127
Ampersands (`&&`), JSP operator, 494
and, XPath operator, 253
Anonymous access, 1088, 1365
Ant tool. *See also* ant tool.
ANY keyword, 55
APIs (application programming interfaces)
 See also DOM
 See also JAXR
 See also JAX-RPC
 See also JMS
 See also SAX
 See also SOAP
 See also XSLT
 by container type, 16–17
 ContentHandler, 108
 DefaultHandler, 108
 DTDHandler, 109
 EntityResolver, 109
 ErrorHandler, 108
 Java Logging APIs, documentation, 28
 JavaMail API, 18–19
 JAXP (Java API for XML Processing)
 definition, 1379
 libraries, 106, 113
 overview, 19
 JDBC
 accessing databases from Web applications, 100–101
 data sources, 1329
 definition, 1381
 overview, 21
 resource connections, 1077
 resource manager, 1076
 resources, 1077
 transactions, 1058–1061, 1069
JTA (Java Transaction API)
 definition, 1379
 overview, 18
 transactions, 1063–1064, 1069
overview, 16–23
SAAJ (SOAP with Attachments API for Java). *See also* SOAP
connections, 344–345
definition, 1394
overview, 20, 340
SOAPConnection objects, 344–345
uses for, 339
SAXParser, 107
SAXParserFactory, 107
SAXReader, 107
StAX (Streaming API for XML), 1345
`'`, apostrophe entity, 49
appclient tool, 26
Applet containers, 10, 1365
Applets, 4, 6. *See also* applet containers;
 applications.
 definition, 1365
 JSP pages, 508–510
 overview, 4
Application architects, JavaServer Faces technology, 635
Application assemblers, 15–16, 1365
Application client containers, 10
 definition, 1365
 overview, 10
 tools, 26
Application client modules, 13, 1366
Application clients, 5, 858
 coding, 859
 compiling, 861
 creating, 858–863
 definition, 1365
 deployment descriptors, 13
 developer role, 15
Duke's Bank, 1310, 1312, 1317
 classes, 1311
 running, 1338
enterprise bean reference, specifying, 862–863



Application clients (*Continued*)
enterprise bean references, examples, 1055–1056, 1062, 1067
examples, 333, 860, 1004. *See also* book-store example; Coffee Break example; online banking example.
JAR files, 858
locating local Web services, 333–336
overview, 3–5
packaging, 334, 861–862
running, 869
thin *versus* thick, choosing, 5

Application configuration resource files
description, 792
making available, 792–793
specifying path to, 814–815

Application Deployment Tool. *See* deploy-tool.

Application development role, 14–16, 634–635

Application exceptions, 901–902

Application processing instructions, 35–36, 46–47

Application programming interfaces (APIs). *See* APIs.

Application Server. *See also* Admin Console.
Admin Console, starting, 27
asadmin utility, starting/stopping, 25, 27
authorized users, adding, 1089. *See also* security.
connection factories, JNDI subcontexts, 1076
creating data sources, 102, 1079
creating mail sessions, 1082
debugging applications, 28–29
default domain, 25
deployment descriptor for, 12–13
deploytool utility, starting, 27
digital certificates, 1115, 1119–1120
enabling debugging, 29
help, where to find, 25
JavaServer Faces, 24–25
JSTL, overview, 24

overview, 23–29
password, specifying, 25
PointBase database server, starting/stopping, 28
port number, 25
server log, 25, 28–29
server logs, 28
starting, 25
starting/stopping, 25
stopping, 27
technologies, overview, 24–25
tools, 25–26
tools, overview, 25–29
user interface technologies, 24
user name, specifying, 25
--verbose flag, 28

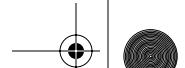
Applications. *See also* applets.
client-tier security, 1145–1146
component providers, 15, 1366
components
component-managed sign-on, 1148
container-managed sign-on, 1147
EIS-tier security, 1147–1149
resource adapter security, configuring, 1148–1149

configuration resource files. *See also* JavaServer Faces.
definition, 1366
description, 792
making available, 792–793
specifying path to, 814–815

data flow, managing. *See* JavaBeans components.

deployer and administrator role, 16

JavaServer Faces technology
backing beans, 642–644
buttons, 639
commandButton tag, 639
creating pages, 638–640
data validation, 640
definition, 633–634
development process, 635–637
displaying error messages, 640
form tag, 639

**INDEX****1409**

- input forms, 639
- `inputText` tag, 639
- managed bean declarations, 643–644
- message tag, 640
- page navigation, 640–641
- text fields, 639
- `validateLongRange` tag, 640
- overview
 - Admin Console, 27
 - APIs, 16–23
 - Application Server, 23–29
 - components, 3–8
 - containers, 8–10
 - debugging, 28–29
 - development roles, 14–16
 - distributed, 2–3
 - installing, 16
 - managing, 27
 - packaging, 12–14
 - Web services, 10–12
- `applicationScope` object, 493
- Application-specific objects, 488
- `apply-templates` instruction, 284
- Architecture. *See also* J2EE Connector architecture.
- JAXR (Java API for XML Registries), 391–393
- JMS (Java Message Service) API, 1158–1161
- Archiving, 40–41, 1366
- Arithmetic functions, 256
- Arithmetic operators, 494
- Array properties, initializing, 799
- Arrays, 325, 557
- `<article>` document type, 279
- `asadmin`, 26
- `asadmin start-domain --verbose domain1`, 25
- `asadmin stop-domain domain1`, 27
- `asadmin` utility
 - definition, 26
 - deploying WAR files, 92
 - deploying Web modules, 90–91
 - starting/stopping, 25, 27
- `asant`, 26
 - examples, 856
- `asant` tool, 26, 1366
- Assembly process, 8–9. *See also* containers.
- Asterisk (*)
 - DTD qualifier, 53
 - JSP operator, 494
 - XPath operator, 253
 - XPath wildcard, 252
- Asynchronous message consumption, 1161
 - compiling, 1185
 - JMS client example, 1183
 - JMS provider, starting, 1185
 - message listener, 1184–1185
 - overview, 1183
 - packaging, 1185–1186
 - receiving program, 1184
 - running, 1186–1187
 - sending program, 1183–1184
 - writing the programs, 1183–1185
- Asynchronous message processing, 838–840
- Asynchronous messages, 1155, 1161
- At sign asterisk (@*), XPath wildcard, 252
- AttachmentPart class, 343, 358
 - creating objects, 358
 - headers, 359
- AttachmentPart object, 358–360
 - accessing, 360–361
 - adding content, 358–360
 - creating, 358–361
- Attachments, 342
 - adding, 358
 - SAAJ example, 385
- Attachments, SAAJ messages, 341–342, 342–344, 385–387
- Attachments.java, 385–387
- ATTLIST tag, 58
- attribute directive, 579, 580
- attribute element, 571–572, 595–596
- Attribute node, 248
- Attribute nodes, 207
- Attribute specification parameters, 60
- Attribute value template, 298



Attributes, 33, 43, 222

adding to elements, 3

creating, 236

defining, 57–60

defining in DTD, 57

definition, 1366

description, 33

DOM, creating, 236

encoding, 35

JSP custom tags

defining in XML element body,
571–572

dynamic, 570–571, 588–589

fragment, 569–570, 584–588

`jsp:attribute` element, 571–572

simple, 569, 585–586, 586–588

namespaces, 71

SAAJ messages

actor attributes, 363–365

header attributes, 362–363

`mustUnderstand` attribute, 365–366

overview, 361–362

SOAP envelope, 351

standalone, 35

tag, declaring, 579

transactions

definition, 1046–1047

list of, 1050

setting, 1049–1050

types of, 59

validation, 600–602

version, 35

vs. elements, 75–76

in XML tags, 33

Attributes referencing backing bean methods, 719

`action` attribute, 639, 657, 668, 719–720

`actionListener` attribute, 657, 719–721

`validator` attribute, 719–720, 722

`valueChangeListener` attribute,

719–720, 722–723

Attribute-specification parameters, 59

Authentication, 1088, 1114, 1361. *See also*
JAX-RPC; security.

application clients, configuring, 1151

basic, 1100, 1128

configuring, 1097–1098

example, 1126–1133

overview, 1100–1101

protecting passwords, 1113–1114

client, 1123

client, configuring, 1151

client-certificate

adding using `deploytool`, 1141

client certificate, creating, 1120–1121

enabling, 1137–1138

example, 1133–1142

overview, 1102–1103

configuring, 1093, 1095, 1105

definition, 1088, 1114, 1366

digest, 1105

entities, 1125

form-based

configuring, 1097–1098

example, 1105

overview, 1101–1102

protecting passwords, 1113–1114

and SSL support, 1113–1114

form-based, example, 1105–1114

mutual, 1103–1105, 1123–1124,

1133–1142

example, 1133

overview, 20, 22, 1088–1089, 1100–1105

Web resources

configuring, 1105

Duke's Bank, 1326

form-based, 1101

HTTP basic, 1100, 1105, 1126

SSL protection, 1114

XML registries, 404

for XML registries, 404

Authorization, 1088, 1361

constraints, 1366

definition, 1088, 1366

overview, 20, 22

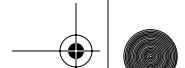
Authorized users, 8–9. *See also* containers;
security.

AUTO_ACKNOWLEDGE mode, 1193

B

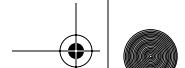
 (bold) tag, 280
 B2B (Business-to-business), 1366
 Backing bean methods, 642, 720, 755, 775, 784
ActionEvent, 749, 757
 attributes referencing. *See* attributes referencing backing bean methods.
 navigation, 755–757
 overview, 755
 referencing, 719–722. *See also* referencing backing bean methods.
 validation, 757–758
ValueChangeEvent, 748, 758–759
 writing. *See* writing backing bean methods.
 Backing bean properties, 642, 657–658, 706, 730, 775, 784
 bound to component instances, 739–740
 properties for *UISelectItems* composed of *SelectItem* instances, 737–738
UIData properties, 732
UIInput and *UIOutput* properties, 731
UISelectBoolean properties, 734
UISelectItems properties, 737
UISelectMany properties, 734
UISelectOne properties, 735
 Backing beans, 634, 642, 651, 653, 656–659, 755, 763
See also enterprise beans
See also entity beans
See also message-driven beans
See also session beans
 binding component values and instances, 657–659
 configuring
 array properties, initializing, 799
 custom converters, registering, 804–805
 custom validators, registering, 803–804
 graph (tree) of beans, 799–801
 implicit objects, referencing, 796–797
 initialization parameters, referencing, 796–797

initializing properties, 795–796
 instances of *List*, 795
 instances of *Map*, 795
 list properties, initializing, 799
list-entries element, 795
 lists, initializing, 801–802
 managed bean declarations, 643–644
 managed bean properties, initializing, 799–801
managed-bean element, 793–795
managed-bean-class element, 794
managed-bean-scope element, 794
managed-property element, 795–796
 map properties, initializing, 797–798
map-entries element, 795, 797–798
 maps, initializing, 801–802
 messages, registering, 802–803
 overview, 793
 creating, 659, 793–795
 definition, 634, 1366–1367
 developing, 642–643
 instantiating, 793–802
 managed bean declarations, 643–644
 managing, 656–659
 method binding. *See* method binding.
 method-binding, 657
 methods. *See* backing bean methods.
 properties. *See* backing bean properties.
 properties, binding to component instances, 718–719
 storing, 659
 value binding. *See* value binding.
 value-binding, 657
 values, binding to component instances, 683
 Backus-Naur Form (BNF), 1016, 1023–1026
 Bank account example. *See* BMP examples; online banking example.
 BankBean example. *See* examples, container-managed transactions; online banking example.
 Base64 encoding, 1101
 Basic authentication, 1367
 Basic logic, 183



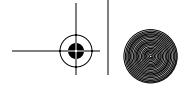
Bean instances, locating, 912–913
Bean-managed persistence (BMP). *See also* BMP.
Bean-managed transactions, 1217. *See also* transactions, bean-managed.
Beans
 See backing beans
 See enterprise beans
 See entity beans
 See message-driven beans
 See session beans
Behavioral interfaces, JavaServer Faces technology, 646–647
BETWEEN expressions, 1035
Bidirectional relationships, 837–838
BigDecimal data types, 1044
BigInteger data types, 1044
Binary entities. *See* unparsed entities.
Binding, 40
 backing beans to component values and instances, 657–659
 component instances to
 bean properties, 718–719
 bean values, 683
 component values to
 external data sources, 683, 714–718
 implicit objects, 717–718
 properties, 715–716
 data to objects, 686–689
JavaServer Faces technology, 1367
 XML, 40, 1367
binding attribute, 683
Binding templates
 adding to an organization with JAXR, 407
 finding with JAXR, 403
Blanks. *See* whitespace.
BLOB databases, 991
BMP (bean-managed persistence). *See also* CMP.
 defined, 834
 definition, 1367
 entity beans, 834
 examples, 903, 924, 932
 isolation levels, 1071

relationships, 834
 vs. container-managed, 941
BMP examples
 bean instances, locating, 912–913
 business methods, 910–913, 916–917
 creating, 903–904
 data source, defining, 917
 database calls, 913–914
 database table, creating, 917–918
 deploying the application, 918
 deploytools utility, 937
 entity bean class, 904
 entity beans
 deleting, 907
 finder methods, creating, 914–916
 finder methods, description, 908–910
 locating, 908–910, 912
 entity state, inserting in database, 905–906
 home interface, 914–916
 home methods, creating, 914–916
 home methods, description, 912–913
 instance variables, 905–908
 mapping table relationships
 child table, entity bean, 927–929
 child table, helper class, 923–926
 foreign keys, 919–922
 many-to-many, 930–933
 one-to-many, 922–930
 one-to-one, 919–922
 primary key, returning, 905–906
 primary key class, 934–935
 primary keys, 935–936
 remote interface, 916–917
 running, 917–918
 session beans, creating and packaging, 937
BNF (Backus-Naur Form), 1016, 1023–1026
Bodies, JSP custom tags, 572
body-content attribute, 579
body-content element, 595
BodyTag interface, 623
BodyTagSupport class, 623



Bookstore example
 applet, 509
 common classes and database schema, 100
 database, 100–104
 image map, 765–770
 iteration tags, 608–610
 JavaServer Faces, 659–662, 672–675
 JavaServer Faces technology version, 659, 672–675
 JSP custom tags
 bookstore examples, 564–568
 dynamic attributes, 588–589
 fragment attributes, 586–588
 simple attributes, 585–586, 586–588
 variables, 572–573
 JSP documents, 516–521
 JSP documents in, 516
 JSP pages, 476–482
 JSP tag files, variable synchronization, 582–584
 JSP with basic JSTL version, 476
 JSP with example custom tags, 564
 JSP with JSTL SQL tags, 538
 JSP with JSTL XML tags, 551
 JSTL (JavaServer Pages Standard Tag Library), 538–541
 MVC architecture, 477
 populating the database, 101
 programming tag handlers, 608–616
 scripting, 618–619
 servlet version, 436
 servlets, 436–441
 tag files, variable synchronization, 582–584
 template tag library, 610–613
 use of JSTL tags, 478
 user interface, 659–662
 variable synchronization, tag files, 582–584
Boolean, 252
 functions, 256
boolean components, defining, 697
boolean function, 256

Boolean functions, 256
Boundaries, transactions, 1046, 1073
BufferedReader class, 449
Buffering, 485
Build files, 1367
bundle tag, 554–555
Business components, 3, 6–7. *See also enterprise beans.*
Business logic, 830, 912
 in applications. *See enterprise beans.*
definition, 1367
overview, 3, 6–7
Business methods, 841, 860, 863
 client calls, 877
 CMP example, 945
 defining, 916–917
 definition, 1367
 description, 910–911
 examples, 910, 945
 exceptions, 878
 invoking, 860, 877–878, 912–913
 local interfaces, 947
 message-driven beans, 1005
 requirements, 878
 signature, 878
 transactions, 1049, 1052, 1068, 1071
Business objects, 833, 903
Business tier, 2–3, 5–7. *See also enterprise beans.*
Businesses
 contacts, 405
 creating with JAXR, 404
finding
 by name with JAXR, 400, 421
 using WSDL documents with JAXR, 424
finding by classification with JAXR, 401, 421
keys, 405, 411
publishing with JAXR, 408
removing with JAXR, 411, 421
saving with JAXR, 420, 422, 424
BusinessLifeCycleManager interface, 392, 399, 404



B
BusinessQueryManager interface, 392, 399
Business-to-business (B2B), 1366
Buttons, user interface, 639, 685
BytesMessage interface, 1171

C
call method, 344–345, 353
Call object, 330
Callback methods, 1367
Caller principals, 1367
Calling procedures remotely, 19. *See also JAX-RPC.*
Canceling timers, 893–894
Capability levels, JAXR, 390
capture-schema, 26
capture-schema tool, 26
Cascade deletes, 977, 991, 1368
Cascading style sheet (CSS), 1370
Case sensitivity, XML, 43
Case studies. *See examples.*
catch tag, 544, 549
CCI. *See J2EE Connector architecture, CCI.*
CCI (Common Client Interface), 1362–1363
CDATA, 212, 222
 versus PCDATA, 54
CDATA node, 211
CDATA sections
 definition, 1368
DOM, 222
JSP documents, 528
nodes, converting to Text nodes, 212
in SAX, 147–149, 164. *See also lexical events.*
text with XML-style syntax, 51–52
ceiling function, 256
Certificate authority, 1102, 1368
certificate realm, 1088–1089
Certificates. *See digital certificates.*
Chained filters, 307
Character encoding, 824–825
Character encodings, 824, 1341
 ISO 8859, 824

ISO-8859-1, 1341
US-ASCII, 1341
UTF-8, 824, 1341
UTF-16, 1342
Character events, 125–127
Character references, 50
Character sets, 823–824
 IANA registry, 1342
 Unicode, 824
 US-ASCII, 824
characters method, 119
Checkboxes, 697–698, 703–704
Child access, controlling, 217
choose tag, 544, 546, 550
Class files, modifying, 870–871
Classes
 custom UI components, 778–786
 including in JavaServer Faces applications, 817
Java localization, 819–820
JavaServer Faces technology, 645–646
Classic tags, 623
 tag handlers, 623
 with bodies, 626
 defining variables, 629–630
 how invoked, 625
 life cycle, 625
 methods, 624
 shared objects, 627, 629
 variable availability, 629
Classic tags, scripting, 623
Classification schemes, 421–423
 finding with JAXR, 406
ISO 3166, 400
NAICS, 400, 421
postal address, 412, 421
publishing with JAXR, 412, 421
removing with JAXR, 423
UNSPSC, 400
 user-defined, 412
Classifications, creating with JAXR, 406
Classifications (taxonomies)
 adding, 406
 defining, 412–414

- finding organizations by, 401–403
- postal addresses, specifying, 414–416
- Classifications (XML registries), 406**
- Client applications**
 - access, entity and session beans, 840–845
 - invoking. *See appclient tool.*
- Client applications, JMS, 1173**
 - packaging, 1181, 1185
 - running, 1182, 1186
 - running on multiple systems, 1187
- Client authentication, 20, 1151. *See also JAX-RPC.***
- Client certificates, 1120–1121. *See also digital certificates.***
- Client ID, for durable subscriptions, 1200**
- Client machines, 2–3**
- Client requests, 11. *See also SOAP.***
- Client state**
 - accessing sessions, 464
 - associating objects with sessions, 465
 - notifying session objects, 465
 - session management, 466
 - session tracking, 466–467
- Client tier, 2–6**
- CLIENT_ACKNOWLEDGE mode, 1194**
- Client-certificate authentication**
 - adding using `deploytool`, 1141
 - client certificate, creating, 1120–1121
 - definition, 1368
 - enabling, 1137–1138
 - example, 1133–1142
 - overview, 1102–1103
- Clients, authenticating, 1102, 1123, 1133**
- Clients, JAXR, 391**
 - examples, 417
 - implementing, 393
- Clients, Web services**
 - application, 333–336
 - creating, 314–324
 - DII (dynamic invocation interface), 329–333
 - dynamic proxy, 326–329
 - static stub, 321–324
 - unknown until runtime, 329–333
- CLOB databases, 991**
- close method, 354**
- CMP (container-managed persistence), 835. *See also BMP.***
 - cascade deletes, 991
 - definition, 1369
 - EJB QL, 835, 990, 1015
 - EJB QL (Enterprise JavaBeans Query Language), 1044
 - entity beans, 834, 835–838
 - examples, 939
 - isolation levels, 1071
 - one-to-many, 987
 - one-to-one, 986
 - overriding, 17, 21
 - persistent fields, 943
 - primary keys, 987
 - compound, 988
 - primitive types, 987
 - unknown, 987
 - relationship fields, 943
 - relationships, 834
 - table mapping, 989
 - vs. bean-managed, 941
- CMP examples**
 - abstract schema name, selecting, 1001
 - database tables, creating, 1002
 - `deploytool` utility, 1000–1002
 - finder methods, defining EJB QL queries, 1001
 - inventory and ordering
 - bean relationships, 985–987
 - BLOB databases, 991
 - building, 992–1000
 - CLOB databases, 991
 - configuring entity bean relationships, 995–996
 - creating modules, 993–995
 - databases, 989, 992
 - deploying, 999
 - entity beans, 989, 991, 995–996
 - finder methods, 990
 - finder queues, 996–997
 - finding orders, 990, 996–997



CMP (Continued)

- foreign keys, 987
- home methods, 990
- one-to-many relationships, 987
- one-to-one relationships, 986
- packaging, 993–999
- primary keys, 987–989
- running, 992–1000
- selecting methods, 990
- selecting orders, 990, 996–997
- selector queues, 996–997
- self-referential relationships, 985–986
- setting enterprise bean references, 999
- setting transaction attributes, 997
- structure, 984
- unidirectional relationships, 987
- persistent fields, selecting, 1001
- relationships, defining, 1002
- select methods, defining EJB QL queries, 1001

CMP examples, team roster

- access methods, 942–943
- building, 958–969
- business methods, 945
- container-managed *vs.* bean-managed, 941–942
- create methods, defining, 946–947
- data source, creating, 959
- database tables, creating, 958–959
- EJB QL queries, adding, 964–966
- enterprise application

 - creating, 960
 - deploying, 971
 - packaging, 960, 970–971
 - running, 971–972

- enterprise beans

 - creating, 960
 - establishing relationships, 966–967
 - field mappings, 968
 - packaging, 961–969
 - references, setting, 968–971
 - relationship mappings, 968

- entity bean class, 941
- entity bean methods, 945–946

- finder methods, defining, 946–947
- finder methods, description, 944
- home methods, defining, 946–947
- JAR file, viewing settings, 974–980
- local home interface, 946–947
- local interface, 947
- objects, getting, 944
- overview, 939–940
- packaging, 961–964
- persistent fields, 943
- players
 - adding to a team, 949–950
 - adding to teams, 949–950
 - copying a team roster, 953–955
 - creating, 948–949
 - dropping from a team, 950–951
 - finding by position, 955–956
 - getting a team roster, 952–953
 - getting sports of, 956–958
 - removing, 950, 950
- primary key class, 982
- primary key values, generating, 983–984
- primary keys, 980–984
- relationship fields, 943
- rosters
 - copying, 954–955
 - getting, 952–955
 - viewing, 974
 - running, 958–969
- select methods, 944
- settings, viewing, 972–980
- state information, getting, 944
- table schema, capturing, 959–960
- transaction attributes, setting, 968

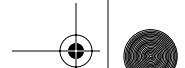
CMR. *See* container-managed relationships.

Coding

- application client, 859
- enterprise bean class, 855–856
- enterprise beans, 854
- home interface, 855
- remote interface, 855
- Web client, 863–864

Coffee Break

- building shared classes, 1292

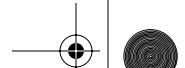
**INDEX****1417**

- JavaServer Faces server, 1284, 1290
 - beans, 1288–1289
 - building, packaging, and deploying, 1297
 - JSP pages, 1285, 1287
 - resource configuration, 1289
- JAX-RPC service, 1257, 1265
 - building, packaging, and deploying, 1292, 1294
 - deleting from registry, 1263, 1265
 - implementation, 1258
 - interface, 1257
 - publishing in registry, 1259, 1263
- removing, 1300
- running the client, 1298
- SAAJ clients, 1266
- SAAJ service, 1265, 1280
 - building, packaging, and deploying, 1294
 - XML messages, 1266
- server, 1280, 1284
 - beans, 1282, 1284
 - building, packaging, and deploying, 1295–1296
 - JSP pages, 1281
- server interaction, 1255
- setting service port numbers, 1291
- setting up the registry server, 1291
- shared files, 1256
- source code, 1290
- Coffee Break example
 - backing beans, 1289
 - billing information, collecting, 1281, 1286–1287
 - checking out, 1288–1289
 - client application, running, 1299–1300
- Coffee Break server
 - building, 1295–1296
 - deploying, 1295–1296
 - JavaBeans components, 1282–1284
 - JSP pages, 1281
 - packaging, 1295–1296
 - running, 1295–1296
- common classes, 1292
- common code, 1256–1257
- delivery information, collecting, 1281, 1286–1287
- JavaBeans components, 1282
- JavaServer Faces version, 1284–1290, 1297–1298
- JAX-RPC service, 1257–1265, 1282, 1292–1294
- JSP pages, 1286–1287
- order confirmation
 - checking completeness, 1281, 1282–1284, 1287, 1288–1289
 - delivery and billing information, 1281, 1286–1287
 - displaying suborders, 1281, 1282–1284, 1287
 - listing objects, 1282
 - retrieving, 1273
 - returning, 1279–1280
- ordering coffee, 1270–1273
- orders, creating, 1270–1273
- price list
 - extracting, 1268–1270
 - reloading, 1284
 - returning, 1274–1279
- Registry Server, setting up, 1291
- removing the application, 1300
- SAAJ service
 - building, 1294–1295
 - deploying, 1294–1295
 - message types, 1265–1266
 - overview, 1265–1266
 - packaging, 1294–1295
 - request, sending, 1267–1268
 - request-response message, 1265–1266
 - running, 1294–1295
 - SAAJ client, 1266–1273
 - SAAJ service, 1274–1280
- server, 1282–1284
 - setting the port, 1291
- shopping cart, 1281–1282, 1285–1286
- WARs, 1292
- Collaboration, JSTL tags, 542–543
- Collection member expressions, 1037

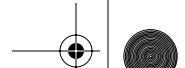


Colon (:), in XML markup, 43, 47
 Combo boxes, 699–700, 703–704
 Command line, argument processing, 119
commandButton tag, 639, 685
 Command-line administration utility. *See*
 Admin Console.
 Command-line tools, list of, 26
commandLink tag, 686
 Commands, digital certificates, 1121
 Comment, 42, 212, 222
 echoing, 167
 node, 248
comment method, 164
 Comment nodes, 206
 Comments
 definition, 1368
 DOM, 222
 DOM, ignoring, 212
 echoing, 164, 167–168
 EJB QL (Enterprise JavaBeans Query
 Language), 1044
 HTML. *See* <NOTE> element.
 transforming XML to HTML, 295
 XML, 34, 42
 Commerce XML (cxml), 1354
 Commit, 1368
commit, 1057–1058, 1063, 1069
commit method (JMS), 1204
 Commit transactions, 1046, 1068
 Commits. *See* transactions, commits.
 Common Client Interface (CCI), 1362–1363
 Common Object Request Broker Architec-
 ture (CORBA), 1370
 Common Secure Interoperability version 2
 (CSIV2), 1143
 Compatibility test suite (CTS), 1370
 Compiling, 128
 application clients, 861, 898
 BankBean example, 1053
 enterprise bean source files, 856
 JSP pages, 483–484
 online banking example, 1330
 SAX, 128–135
 TellerBean example, 1064

WarehouseBean example, 1059
 Web client, 865
 Component, renderer, tag combinations,
 764–765
 Component binding, 658, 714, 718, 730
 advantages of, 658
 binding attribute, 642, 658, 683, 714,
 718
 Component contracts, 1368
 Component properties
 bound to component instances, 739–740
 bound to component values, 730–739
 FacesMessage, 743–744
 localization, 741–744
 message factory, 743
 overview, 730
 resource bundles, 741, 743–744
 UIData, 732–733
 UIInput, 731–732
 UIOutput, 731–732
 UISelectBoolean, 734
 UISelectItem, 736
 UISelectItems, 737–739
 UISelectMany, 734–735
 UISelectOne, 735–736
 user input, selecting from a list, 734–739
 value binding, 783–784
 Component rendering model, 645, 647–651,
 647–651
 custom renderers. *See* custom renderers.
 decode method, 666, 712, 745, 783, 788
 decoding, 763, 778
 delegated implementation, 763
 direct implementation, 763
 encode method, 746
 encodeBegin method, 781
 encodeChildren method, 780–781
 encodeEnd method, 781, 786
 encoding, 763, 778
 HTML render kit, 777, 808
 render kit, 647, 808
 renderer, 761
 Renderer class, 647, 712, 808
 Renderer implementation, 809

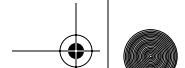
**INDEX****1419**

- RenderKit class, 647
- RenderKit implementation, 809
- Component values, binding to
 - external data sources, 683, 714–718
 - implicit objects, 717–718
 - properties, 715–716
- Component writers, 635
- Component-managed sign-on, 1148, 1368
- Components. *See also* JavaServer Faces,
 - custom UI components.
 - assembly, 8–9. *See also* containers.
 - custom, 726–727
 - identification, 681
 - instances, binding to
 - bean properties, 718–719
 - bean values, 683
- interfaces. *See* containers.
- J2EE components
 - definition, 1377
 - overview, 3–8
 - versus* standard Java classes, 3–4
- JavaServer Faces UI components, 1380
 - overview, 3–8
 - reusing, 12
 - versus* standard Java classes, 3–4
- user interface component model. *See also* JavaServer Faces.
 - action events, 652
 - behavioral interfaces, 646–647
 - classes, 645–646
 - component rendering model, 647–651
 - conversion model, description, 651–652
 - custom components. *See* JavaServer Faces, custom UI components.
 - data validation, 654
 - data-model events, 653
 - event and listener model, description, 652–653
 - mapping classes to tags, 647–651
 - overview, 644–645
 - render kit, 647
 - tags, list of, 648–651
 - UICommand class, definition, 645
- UICommand class, tags, 648
- validation model, 654
- value-change events, 653
- Component-specific services. *See* containers.
- Compound primary keys, 988–989
- Compression, 229
- `com.sun.xml.registry.http.proxy-`
 - Host connection property, 398
- `com.sun.xml.registry.http.proxy-`
 - Port connection property, 398
- `com.sun.xml.registry.https.proxy-`
 - Host connection property, 398
- `com.sun.xml.registry.https.proxy-`
 - Password connection property, 398
- `com.sun.xml.registry.https.proxy-`
 - Port connection property, 398
- `com.sun.xml.registry.https.proxy-`
 - UserName connection property, 398
- `com.sun.xml.registry.useCache` connection property, 398
- `com.sun.xml.registry.userTaxonomy-`
 - Filenames connection property, 398, 414
- concat function, 255
- Concepts
 - publishing with JAXR, 408, 423
 - removing with JAXR, 424
 - in user-defined classification schemes, 412
 - using to create classifications with JAXR, 406
- Concurrent access, 1045
- Conditional expressions, 1033
- Conditional operators, 494
- Conditional sections, 66, 68
- Conditionalized DTDs, 78
- Confidentiality, 1114
- Configuration resource files. *See* application configuration resource files.
- Configuring beans, 793–802
 - managed bean creation facility. *See* managed bean creation facility.

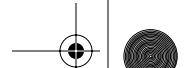


Configuring JavaServer Faces applications, 635
Application class, 793, 802
application configuration resource files, 634, 643, 655, 659, 685, 706–707, 715–716, 721, 750, 792, 805, 809, 811
Application instance, 742–743, 752, 775
attribute element, 804
attribute-class element, 804
attribute-name element, 804
configuring beans. *See* configuring beans.
configuring navigation rules. *See* config-
uring navigation rules.
`faces-config.xml` files, 806
including the classes, pages, and other
resources, 817
including the required JAR files, 816
`javax.faces.appli-`
cation.CONFIG_FILES context
parameter, 792, 814
`javax.faces.STATE_SAVING_METHOD`
context parameter, 815
registering custom converters. *See* regis-
tering custom converters.
registering custom renderers. *See* register-
ing custom renderers.
registering custom UI components. *See*
registering custom UI compo-
nents.
registering custom validators. *See* regis-
tering custom validators.
registering messages. *See* registering mes-
sages.
restricting access to JavaServer Faces
components, 815
specifying a path to an application config-
uration resource file, 814
specifying where UI component state is
saved, 815
turning on validation of XML files, 816
`validateXML` context parameter, 816
verifying custom objects, 816

Configuring navigation rules, 805
action methods, 807
example navigation rule, 806
`from-action` element, 807–808
`from-outcome` value, 808
`from-view-id` element, 807
`navigation-case` element, 806, 808
`navigation-rule` element, 806–807
`to-view-id` element, 807–808
ConfirmBean example, 1082–1083
Connection, 1057–1058, 1069, 1073
Connection class, 1362
Connection factories
creating, 395
deleting, 1191
description, 1163–1164
JNDI subcontexts, 1076
looking up, 395
resource manager connection factory,
1390
Connection factories, JAXR, 395
Connection factories, JMS
creating, 1007, 1178
introduction, 1163
looking up, 1004, 1163
specifying for message-driven beans,
1228
specifying for remote servers, 1188
Connection interface, 392
Connection interface (JAXR), 392, 395
Connection interface (JMS), 1165
Connection interface methods, 1058–1059,
1069, 1073
Connection management contract, 1361
Connection pooling, 1077
Connection pools, 1077
Connection properties, JAXR, 396
examples, 395
ConnectionFactory class (JAXR), 395
ConnectionFactory interface (JMS), 1163
Connections. *See also* resource connections.
JAXR
connection factory, 395
creating, 395–396

**INDEX****1421**

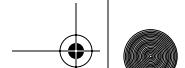
- organizations, finding by classification, 401–403
organizations, finding by name, 400–401
overview, 393–394
properties, 396–399
registries, accessing, 394–395
registries, querying, 399–400
registry access, 394–395
RegistryService object, 399
service bindings, 403
services, finding, 403
SAAJ (SOAP with Attachments API for Java), 344–345
secure, 1114
service bindings, JAXR, 403
Connections, database, 1078
Connections, JAXR
creating, 395
setting properties, 395
Connections, JMS
introduction, 1165
managing in J2EE applications, 1213
Connections, mail sessions, 1081
Connections, SAAJ, 344
closing, 354
point-to-point, 353
Connections, URL, 1083
Connector architecture. *See* J2EE Connector architecture; resource adapter modules.
Connector resource manager, 1076
Connectors, 1369. *See also* J2EE Connector architecture.
Container trust relationships, 1151
Container-managed persistence (CMP). *See* CMP.
Container-managed relationships, 985
bidirection, 940
bidirectional, 837–838
definition, 834
deploytool, 975
direction, 837–838, 842, 977
EJB QL, 838
entity and session beans, 842
examples, 940
local access, 841
many-to-many, 837
many-to-one, 837
multiplicity, 837, 940, 977
one-to-many, 837, 1017
one-to-one, 837, 1030
self-referential, 985
unidirectional, 837–838, 987
Container-managed sign-on, 1147, 1369
Container-managed transactions. *See* transactions, container-managed.
Containers, 8
See also applet containers
See also application client containers
See also EJB containers
See also security
See also Web containers
APIs, overview, 16–17
configurable services, 9
definition, 1369
non-configurable services, 9
overview, 8–10, 16–17
services, 8
services, overview, 8–9
types, overview, 9–10
vs. contents, 76
contains function, 255
Content, 1369. *See also* Web components.
Content (inline) elements, 296–302
Content events, 123
ContentHandler API, 108, 119–120
ContentHandler interface, 119
Contents vs. containers, 76
Context, 249
Context attributes, 1369
Context interface, 859, 1076
Context objects, 1076
Context roots, 89–92, 868, 1369
Contexts, 249
Conversational state, 832, 1370
Conversion functions, 256



Conversion model, 645, 651–652, 731
 converter attribute, 690, 706–707, 723–724
Converter implementations, 652, 705, 724, 745
Converter interface, 744–746
 converter tag, 724
 converter tags. *See* converter tags.
 converterId attribute, 706–707, 724
converters. *See* converters.
converting data between model and presentation, 651
javax.faces.convert package, 706
model view, 745
 presentation view, 745
Conversion model, description, 651–652
Conversions, immediate processing, 681–682
convertDateTime tag, 707–709
converter attribute, 690, 705
Converter implementation classes
 BigDecimalConverter class, 706
 BigIntegerConverter class, 706
 BooleanConverter class, 706
 ByteConverter class, 706
 CharacterConverter class, 706
 DateTimeConverter, 706
 DateTimeConverter class, 706, 707–708
 DoubleConverter class, 706
 FloatConverter class, 706
 IntegerConverter class, 706
 LongConverter class, 706
 NumberConverter class, 706–707, 709–710
 ShortConverter class, 706
converter tag, 705
Converter tags
 convertDateTime tag, 707
 convertDateTime tag attributes, 708
 converter tag, 706–707, 723–724
 convertNumber tag, 707, 709
 convertNumber tag attributes, 709
 parseLocale attribute, 708
ConverterClient program source code, 860–861
Converters, 632, 634, 645, 658, 664–665, 705–710, 724, 744–747
 custom converters, 652, 723–724
 standard converters. *See* standard converters.
Converting data. *See* conversion model; XPath; XSLT.
cookie object, 493
Cooperating tags, 606–608, 627–629
©r, copyright entity, 61
CORBA (Common Object Request Broker Architecture), 1370
Core library, 541–549
Core tags
 convertNumber tag, 709
 JavaServer Faces, 678–680
 XML, 551–552
count function, 254
Country codes, ISO, 3166 400
Cover, Robin, 40
create method, 946–947, 1049, 1370
 bean-managed persistence, 905
 compared to ejbCreate method, 878
 examples, 860, 876, 925
 life cycles, 847, 850
 requirements, 879, 915, 946
createClass method, 406, 413
createClassScheme method, 413
createExternalLink method, 413
createOrganization method, 405
createPostalAddress method, 416
createService method, 407
createServiceBinding method, 407
createTimer method, 893
createValidator method, 754
Credentials, 1370
Cross-platform standard for data, 11
CSIV2 (Common Secure Interoperability version 2), 1143
CSS (cascading style sheet), 1370
CSS styles, specifying, 683



- CTS (compatibility test suite), 1370
- Custom
- components, registering, 810–811
 - converters, registering, 804–805
 - objects. *See also* JSP, custom tags.
 - components, 726–727
 - converters, 724
 - overview, 723–724
 - user interface components. *See* Java Server Faces, custom UI components.
 - validators, 725–726
 - verifying, 816
 - renderer, registering, 808–810
 - validators, registering, 803–804
- Custom converters, 652, 723
- Converter implementation, 804
 - creating, 744–747
 - `getAsObject` method, 745
 - `getAsObject(FacesContext, UIComponent, String)` method, 745
 - `getAsString` method, 746
 - `getAsString(FacesContext, UIComponent, Object)` method, 745
 - registering. *See* registering custom converters.
 - using, 724
- Custom objects
- custom converters, 723–724. *See also* custom converters.
 - custom renderers. *See* custom renderers.
 - custom tags. *See* custom tags.
 - custom UI components. *See* custom UI components.
 - custom validators, 725. *See also* custom validators.
 - using, 723–727
 - using custom converters, renderers and tags together, 764
- Custom renderers, 761–762, 764, 808
- creating the Renderer class, 786–788
 - determining necessity of, 763
 - `getName(FacesContext.UIComponent)` method, 782
- `javax.faces.render.Renderer` class, 771
- performing decoding, 783
 - performing encoding, 780
 - registering. *See* registering custom renderers.
- `ResponseWriter` class, 782, 787
- `startElement` method, 782
 - `writeAttribute` method, 782
- Custom tags, 563–564, 654, 762, 764. *See also* classic tags; simple tags.
- attributes, validation, 600
 - cooperating, 573
 - `createValidator` method, 754
 - creating, 753–755
 - creating tag handler, 772
 - creating using JSP syntax, 573
 - Duke's Bank, 1320
 - `getComponentType` method, 771, 774
 - `getRendererType` method, 771, 776, 788
 - identifying the renderer type, 786
 - `release` method, 776
 - and scripting elements, 623
 - `setProperties` method, 771, 775
 - tag handler class, 753–754, 770–772
 - tag library descriptor, 754, 771, 777
 - tag library descriptors. *See* tag library descriptors.
- template tag library, 565
- `UIComponentTag` class, 771, 774
- `UIComponentTag.release` method, 776
- `ValidatorTag` class, 753–754
- writing the tag library descriptor, 754
- Custom UI components, 653, 723, 761–762, 764, 788
- creating component classes, 778–000
 - delegating rendering, 771, 786–788
 - determining necessity of, 762
 - `getId` method, 782
 - handling events emitted by, 788
 - `queueEvent` method, 783
 - registering. *See* registering custom UI components.



Custom UI components (*Continued*)
 restoreState(FacesContext, Object) method, 785
 saveState(FacesContext) method, 785
 saving state, 771, 785
 setValueBinding method, 775
 specifying where state is saved, 815
 steps for creating, 771
 using, 726
Custom validators, 725, 751
 createValidator method, 754
 custom validator tags, 753–755
 implementing a backing-bean method to perform validation, 750
 implementing the Validator interface, 751
 registering. *See* registering custom validators.
 using, 725
 validate method, 751, 758
Validator implementation, 654, 751, 753–755, 803
Validator interface, 750
validator tag, 750, 753
ValidatorTag class, 753–754
Cxml (Commerce XML), 1354

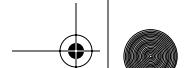
D

Data, 176

 binding to objects, 686–689
 columns, 684
 definition, 1370
 element, 57
 encrypting, 1133
 encryption, 20, 1102. *See also* JAX-RPC.
 flow management. *See* JavaBeans components.
 granularity, entity and session beans, 844–845
 normalizing, 77
 processing, 39
 structure, arbitrary, 264
 tables, 694–696

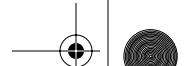
transformations. *See* XPath; XSLT.
types, 252–253
 CDATA, 222
 element, 221
 entity reference, 222
 text, 222
validation. *See* validating.
visibility, 76
Data integrity, 1045
Data model, 248
Data persistence. *See also* BMP; CMP.
 and entity beans, 7
 overriding, 9, 17, 21
Data processing with XML, 39
Data sources, 1077
 connecting to from J2EE components, 1078
 creating, 102–103, 959, 1079
 defining, 917
 definition, 1077
 getting a connection, 101
 looking up with JNDI, 101
 mapping to resource references, 104
Data structure design (XML)
 attributes vs. elements, 75–76
 conditionalized DTDs, 78
 containers vs. contents, 76
 data visibility, 76
 factoring out DTDs, 78
 modularizing DTDs, 78
 normalizing data, 77–78
 normalizing DTDs, 78
 online resources, 74
 stylistic choices, 76–77
 using existing schemas, 74
Database schema, 992
Database server. *See* PointBase database server.
Databases. *See also* persistence.
accessing. *See also* transactions.
 multiple databases, 1071–1072
 servlets, 446–447
 updating multiple databases, 1071–1072
 from Web applications, 100–104

bean-managed persistence, 903, 913
BLOB, 991
BLOBs, 991
 business methods, 910
 calls, 913–914
 capturing schema, 992
 child tables, 923–929
 clients, 830, 840
CLOB, 991
CLOBs, 991
 connecting to from J2EE components, 1078
 connections, 103–104, 848, 878, 901, 1068, 1078–1080
 connectivity, 21. *See also JDBC*.
 creating tables, 903, 917, 958, 980, 992
 data recovery, 1045
 data sources, 102–104
DataSource objects, 101
 deleting rows, 907
 Duke's Bank tables, 1308
 EIS tier, 2
 entity beans, 833
 exceptions, 901
 foreign keys, 836, 919
 inserting rows, 905
 isolation levels, 1070
 mapping entity beans to multiple tables, 989
 message-driven beans and, 839
 multiple, 1063, 1071
 online banking example
 creating, 1329
 reading data from, 1315–1317
 servers, setting up, 1328–1329
 tables, 1308–1309
 validating updates, 1315–1317
 persistent fields, 835
 populating, 101–102
 portable beans, 835
 primary keys, 919, 933
 read-only data, 833
 referential constraints, 920
 relationships for bean-managed persistence, 919
 resource references, 103–104
 synchronizing with entity beans, 907
 table creation, 992
 table relationships
 many-to-many, 930
 one-to-many, 922
 one-to-one, 919
 tables, creating, 917–918, 958–959, 1002
 transactions. *See transactions*.
Data-model events, 653
DataSource interface, 101, 1077
DataSource objects, 101, 1077
 Date and time
 conversion, 707–709
 EJB QL (Enterprise JavaBeans Query Language), 1044
 localization formats, 823
 Date tags, 556
dateParam tag, 557–558
DateTime converter, 707–709
DDP (document-driven programming), 39–40, 1370
 Deactivation, JSP pages, 490, 511–512
 Debugging
 See also error handling
 See also errors
 See also exceptions
 with debuggers, 29
 enabling, 29
JPDA (Java Platform Debugger Architecture), 29
 overview, 28–29
 with server log, 28–29
 socket port, default, 29
 Declaration, 34, 42
 Declarations
 definition, 1370
 JSP documents, 530
 scripting, 620–621
 XML, 42. *See also DTD*.
 Declarative security, 1087, 1370
 Decoding custom UI components, 783
<DEF> (definition) tag, 280
DefaultHandler API, 108
DefaultHandler method, overriding, 145

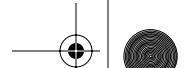


Defining text, 54
Delegation, 1371
`deleteOrganizations` method, 411
Deleting
 cascading deletes, 991, 1368
 concepts, 424–425
 connection factories, 1191
 entity beans, 907
 JAXR classification schemes, 423
 JAX-RPC service from the registry, 1263–1265
 registry entries, 1263–1265
Delivering applications. *See* packaging.
Delivery modes, JMS, 1197
 `JMSDeliveryMode` message header field, 1170
DeliveryMode interface, 1197
Demarcating transactions, 1046, 1073
Deployed Web modules, listing, 92
Deployer, 1371
Deployer roles, 16
Deployment. *See also* `deploytool` utility; packaging; undeploying.
 BMP examples, 918
 CMP examples, 971, 999
 definition, 1371
 J2EE applications, 868–869, 872
 JAXR clients, in J2EE applications, 432
 JAX-RPC (Java API for XML-based RPC), 320–321
 message-driven beans, 1010–1014
 overview, 12–14
 session beans, examples, 883–884, 888, 899–900
 shopping cart example, 883–884
 timer service example, 899–900
 WAR files, 92
 Web modules, 89–92, 91
 Web services, 320–321, 888
Deployment descriptor files, 845–846
Deployment descriptors, 12. *See also* packaging.
 abstract schema, 835
 container-managed persistence, 942

creating, 845, 1092–1100
definition, 1371
EJB QL, 1015
enterprise beans, 845, 847
example, 1131
generating. *See* `deploytool` utility.
overview, 12–14
portable, 12
primary key class, 933
resource adapter, 13–14
runtime, 12
tools, 26
transaction attributes, 1049
validating. *See* `Verifier` tool.
viewing, 1092, 1112
Web application, 83, 86–87, 811
 runtime, 87
`deploytool` utility, 26. *See also* deployment.
 authentication method, configuring, 1105
 basic authentication, 1131–1132
 bean-managed persistence, 937
 client-certificate authentication, 1141
 components that send messages, 1011
 for components that send messages, 1011–1014
 configuring JavaServer Faces applications, 812–816
 container-managed persistence, 972–980, 1000–1002
 creating J2EE applications, 430
 deploying Web modules, 91
 deployment descriptors, creating, 1092–1100
 Edit Relationship dialog box, 976–978
 EJB Ref's tab, 974–975
 Entity tab, 978
 Finder/Select Methods dialog box, 978–980
 General tab, 973–975, 978
 JAR File tab, 974
 JNDI names, specifying, 1013–1014
 JNDI Names tab, 973–974
 message-driven beans, 1010, 1227

**INDEX****1427**

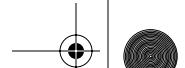
- for message-driven beans, 1010–1011
method permissions, declaring, 1143
overview, 27
redeploy operation, 870
Relationships tab, 975–978
resource adapter security, configuring, 1148–1149
resource references, setting, 1012
security elements, setting, 1092–1100
security pane, 1093–1100
security roles, 1090–1092
starting, 27
Sun-specific CMP Settings dialog box, 980
Design Patterns, Elements of Reusable Object-Oriented Software, 457
Destination interface, 1164
Destinations
 See also JMS
 See also point-to-point messaging system
 See also publish/subscribe messaging system
definition, 1371
JMS programming model, 1164
message destination references, setting, 1012–1013
message destinations, setting, 1013
temporary, 1198–1199
Destinations, JMS
 creating, 1007, 1178
 introduction, 1164
 JMSDestination message header field, 1170
 looking up, 1004, 1164
 temporary, 1199, 1233, 1248
destroy method, 467
detachNode method, 348
Detail interface, 369
Detail object, 368
DetailEntry interface, 369
Development roles, 14–16
 application assemblers, 15
 application client developers, 15
 application deployers and administrators, 16
enterprise bean developers, 15
J2EE product providers, 14
tool providers, 14
Web component developers, 15
Development team, 634–635
Digest authentication, 1105, 1371
Digital certificates. *See also client certificates.*
 for Application Server, 1115, 1119–1120
 client certificate, creating, 1120–1121
 commands for, 1121
 importing, 428–429
 keytool, 1116, 1121
 mutual authentication, 1120–1121
 and mutual authentication, 1120–1121
 overview, 1115–1116
 principal name, 1089
 server certificate, creating, 1116–1118
 signing, 1118–1119
Digital signatures, 1116
DII (dynamic invocation interface) clients, 329–333
Directives, JSP documents, 525–527
Directives, tag files
 attributes
 attribute, 579, 580
 body-content, 579
 list of, 577–578
 tag attributes, declaring, 579
 tag variables, declaring, 579, 586–588
 tags, declaring, 576
 uses for, 576
 variable, 580–581
 variable synchronization, 580–584
Directory operations, 21–22. *See also JNDI*.
Directory services, 21–22
Disabling scripting, 620
Discovering JAX-RPC service, 1282
DISTINCT keyword, 1042
Distributed applications, 2–8, 1371
Distributed communication, 18. *See also JMS*.
div
 JSP operator, 494
 XPath operator, 253
DNS, 22



DNS services and JNDI, 22. *See also* JNDI.
`doAfterBody` method, 627
DocType node, 208, 222
DOCTYPE tag, 56
Document class, 184
Document events, 123–124
Document locator, 136–137
Document Object Model (DOM). *See* DOM.
Document root, 86, 1372
Document type definition (DTD). *See* DTD.
Documentation, module type, 13
DocumentBuilderFactory, 212, 238
 configuring, 238
Document-Driven Programming. *See* DDP.
Document-driven programming (DDP),
 39–40, 1370
Documents, 176
 See also data
 See also JSP, documents
 See also JSP pages
 See also XML documents
 definition, 1371
 element, 57
 events, 123
 fragment, 222
 node, 222
 type, 279
 vs. data, DOM, 176
`doEndTag` method, 624
`doFilter` method, 454–455, 460
`doGet` method, 448
`doInitBody` method, 626
DOM (Document Object Model), 117, 1345.
 See also JAXP; SAX.
 applications, extending, 218, 227
 attributes, creating, 236
 CDATA nodes, converting to Text nodes,
 212
 choosing a model, 181–182
 comments, ignoring, 212
 constructing, 182
 creating
 configuring the factory, 187
 declaring the DOM, 184

element nodes, creating, 230–231
error handling, 184–185
from the factory, 228–229
getting a parser, 186
importing classes, 183–184
instantiating the factory, 185
modifying code, 229–230
parsing a file, 186
running the program, 186
skeleton program, 182–183
text nodes, creating, 230–231
validation errors, 187–188
definition, 1371
displaying a hierarchy, 189
displaying a JTree, 195
displaying in a JTree
 AdapterNode class, 195–200
 adapting TreeModel to JTree,
 195–204
 adding import statements, 189–190
 attribute data, 222
 CDATA, 222
 comments, 222
 complex tree, 207–211
 compressing the tree view, 213
 converting DomEcho to a GUI, 189
 creating adapters, 195
 data types, 221–223
 display components, 192–194
 displaying the tree, 223
 document fragments, 222
 documents, 222
 element content, defining, 220–223
 element data, 221
 entity data, 222
 entity reference data, 222
 GUI framework, 190–191
 lexical controls, 212
 modifications, 228
 notations, 222
 processing instructions, 222
 running the application, 225–227
 simple tree, 205–207
 text data, 222

- TreeModel adapter, 200–204
- wiring the JTree to the JEditorPane, 223–224
- displaying in a JTree, nodes
 - changing, 236
 - child access, 217
 - DocType, 222
 - getting content of, 235–236
 - inserting, 237
 - making selectable, 213–215
 - removing, 236
 - searching for, 234–235
 - subnodes, concatenating, 220–223
 - traversing, 234
 - types, identifying, 219–220
 - visibility, 216
- documents *vs.* data, 176
- element nodes, 175
- entity reference nodes, expanding, 212
- interfaces, 111
- library, 106
- mixed-content model, 177
- nodes, 177
 - changing, 236
 - DocType, 222
 - getting content of, 235–236
 - inserting, 237
 - making selectable, 213–215
 - removing, 236
 - searching for, 234–235
 - subnodes, concatenating, 220–223
 - text, 175
 - traversing, 234
 - types, identifying, 219–220
 - types of, 175, 177–181
 - visibility, 216
- normalizing, 231–233
- overview, 19, 110–111
- packages, 111
- reading XML data, 182–188, 258–259
- SAAJ and, 344, 358, 381
- SAAJ messages, 344, 381–385
 - in SAAJ messages, 357, 381–385
- versus* SAX, 115
- structure, 180
- transforming data, 247
- tree structure, 175
- uses for, 106, 176
- validating
 - configuring the DocumentBuilder factory, 238
 - with multiple namespaces, 239–240
 - overview, 237
 - schemas, associating with documents, 238–239
 - schemas, declaring, 241–243
 - with XML schema, 237–243
- whitespace, ignoring, 212
- writing as an XML file, 257–264
- writing out a subtree, 263
- writing out as an XML file, 257
- XML standard, 1345
- Dom4j, 117, 178, 1345–1346
- Domains, 25
 - Application Server default, 25
 - `asadmin start-domain --verbose domain1`, 25
 - `asadmin stop-domain domain1`, 27
 - definition, 25
 - EJB QL queries, 1027–1030
 - JMS (Java Message Service) API, 1159–1161
 - messaging, 1159–1161
 - overview, 25, 27
 - security policy, 1392
 - security technology, 1392
 - `start-domain` command, 25–27
- DomEcho, converting to a GUI, 189
- DOMExample.java, 381–385
- DOMSrcExample.java, 381–385
- doPost method, 448
- doStartTag method, 624
- doTag method, 599
- Drawing Meta Language (DrawML), 1353
- DrawML, 1353
- DrawML (Drawing Meta Language), 1353
- Drop-down lists, 699–700, 703–704



- DTD (document type definition), 35, 1346, 1348. *See also XML.*
- ANY keyword, 55
 - ATTLIST tag, 58
 - attribute specification parameters, 60
 - attribute types, 59
 - attributes, defining, 57–60
 - basic definitions, 52–53
 - conditionalized DTDs, 78
 - data elements, 57
 - defining attributes, 57
 - defining entities, 60
 - defining namespaces, 72
 - definition, 1372
 - DOCTYPE tag, 56
 - document elements, 57
 - document type, specifying, 56
 - documents vs. data, 57
 - duplicate definitions, 55
 - EMPTY keyword, 55
 - entities
 - binary content, 63, 64–65
 - conditional sections, 66
 - defining, 60–63
 - external, 62–63
 - general, 63
 - image files, 64–65
 - internal, 60–61, 63
 - MIME data types, 64–65
 - multimedia data files, 64–65
 - parameter, 66–68
 - parsed, 63
 - unparsed, 63, 64–65
 - XML content, 63
 - entities, referencing
 - binary entities, 64–66
 - with entity references, 66
 - external entities, 62–63
 - parameter entities, 66–68
 - unparsed entities, 64–66
 - ENTITY tag, 60–61
 - external subset of document, 56
 - factoring out, 78
- hyphenation hierarchies, 70
- IGNORE keyword, 69
- INCLUDE keyword, 69
- industry-standard, 74
- JSP documents, 531–532, 533–535
- limitations, 54–55
- local subset of document, 56
- mixed-content model, 54
- modularizing, 78
- namespaces
 - and attributes, 71
 - defining, 72
 - defining prefixes, 73–74
 - purpose of, 71
 - referencing, 72–73
- naming conflicts, 70–71. *See also namespaces.*
- nested elements, 54
- normalizing, 78
- NOTATION keyword, 64
- parameterized, parsing in SAX, 162–163
- parsing the parameterized, 162
- PCDATA (parsed character data), 54
- PUBLIC keyword, 62–63
- referencing, 56–57
- in SAX, 171–172
- SAX warnings, 163
- special element values, 55
- SYSTEM keyword, 62–63
- text definitions, 54
- warnings, 163
- whitespace, 52
- XML standard, 1346
- DTDHandler API, 109, 171
- Duke's Bank example. *See online banking example.*
- Duke's Bookstore. *See bookstore example.*
- DUPS_OK_ACKNOWLEDGE mode, 1194
- Durable subscriptions, 1160, 1200–1204, 1372
- Durable subscriptions, JMS, 1200 examples, 1202, 1222
- Dynamic attributes, 570–571, 588–589, 601–602

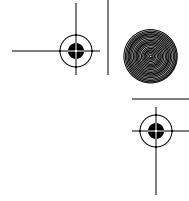
**INDEX****1431**

Dynamic content. *See also* JSP; servlets.
JSP documents, 527–530
JSP pages, 487–489
overview, 6, 18
Dynamic invocation interface. *See* DII.
Dynamic invocation interface (DII) clients, 329–333
Dynamic proxies, 326
Dynamic proxy clients, 326–329
examples, 326
Dynamic reloading, 93–95
DynamicAttributes interface, 601

E

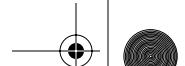
EAI (enterprise application integration), 20–21
.ear file extension, 12
EAR (Enterprise Archive) files, 12–13, 1372. *See also* packaging.
EbXML (Electronic Business XML), 12, 20, 1354. *See also* JAXR.
definition, 1372
overview, 12, 20
registries, 390–391
XML standard, 1354
EbXML Registry and Repository standard, 390
Echoing
comments, 164, 167–168
entity references, 153–154
external entity, 153–154
lexical information, 168–171
XML files
application skeleton, 118
classes, importing, 118
ContentHandler, 119–120
I/O, setting up, 119
output, 121–123
overview, 117
parser, setting up, 120–121
XML files, event handling, 123–127
E-commerce, XML standard, 1353–1354

EditValueHolder interface, 646
Editors, XML, 40
EIS (enterprise information systems), 1357, 1362
J2EE interaction. *See* J2EE Connector architecture.
EIS tier, 8
overview, 2–3, 8
security
component-managed sign-on, 1148
container-managed sign-on, 1147
overview, 1147
resource adapter security, configuring, 1148–1149
EJB, timer service, 892
EJB (Enterprise JavaBeans). *See also* enterprise beans.
container providers, 1372
containers, 10, 1372. *See also* enterprise beans; transactions, container-managed.
context, 1373
definition, 3, 1374
home objects, 1373
JAR files, 13, 1373
modules, 13, 1373
objects, 1373
overview, 17
server providers, 1373
servers, 1373
EJB containers, 10
bean-managed persistence. *See* BMP.
container-managed persistence, 834
container-managed transactions, 1046
generating primary keys, 983
instance contexts, 892
instantiating enterprise beans, 847, 876
message-driven beans, 1214
onMessage method, invoking, 1005
persistence, 939
persistent fields, 943
relationships, 834, 939
services, 829–830



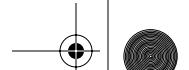
EJB JAR files, 845
container-managed relationships, 842
EJB QL, 1015, 1028
portability, 845
EJB QL (Enterprise JavaBeans Query Language), 1015
abstract schema, 1016
abstract schema name, 1016
abstract schema type, 1016
abstract schemas, 1016, 1029, 1041
arithmetic functions, 1037
`BigDecimal` data types, 1044
`BigInteger` data types, 1044
BNF (Backus-Naur Form), 1016
boolean logic, 1038
case sensitivity, 1027
`cmp_field` element, 1030
`cmr_field` element, 1030
collection member declarations, 1029
collections, 1029, 1037
comments, 1044
compared to SQL, 1015, 1019, 1028
conditional expressions, 1032–1033
container-managed persistence, 1044
date and time values, 1044
definition, 1374
delimiters, 1030
deployment descriptors, 835
`deploytool`, 978, 1001
domain of query, 1015, 1027–1028
EJB containers, 835
examples, 996, 1017, 1019–1021, 1032
finder methods, 835, 956
identification variables, 1017, 1027–1028
inheritance, 1044
input parameters, 1033
multiple declarations, 1028
navigation, 1016, 1019, 1029, 1032
navigation operator, 1019, 1030
null values, 1036, 1038
operators, 1034
parameters, 1018
path expressions, 1016, 1030
 definition, 1016

examples, 1032
expression types, 1031
navigation, 1032
syntax, full, 1030–1032
persistent fields, 1016
queries
 adding, 964–966
 conditional expressions, 1032–1040
 defining, 1001
 defining the query domain, 1027–1030
 identification variables, declaring, 1027–1030
 return types, defining, 1040–1043
 sorting results, 1027–1030
range variables, 1029
relationship direction, 838
relationship fields, 1016
restrictions, 1044
scope, 1015
select methods, 944
string functions, 1037
syntax, full
 aggregate functions, 1042–1043
 BNF grammar, 1023–1026
 BNF symbols, 1023
 FROM clause, 1027–1030
 collection member expressions, 1037
 conditional expressions, 1033
 DISTINCT keyword, 1042
 empty collection comparison expressions, 1037
 equality semantics, 1039–1040
 BETWEEN expressions, 1035
 IN expressions, 1035
 functional expressions, 1037–1038
 LIKE expressions, 1036
 literals, 1032–1033
 NULL comparison expressions, 1036
 NULL values, 1038–1039
 OBJECT keyword, 1042
 operator precedence, 1033
 ORDER BY clause, 1027–1030
 path expressions, 1030–1032
 SELECT clause, 1040–1043

**INDEX****1433**

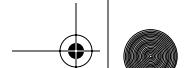
WHERE clause, 1032–1040
syntax, simplified, 1016–1017
syntax diagram, 1023
types, 1031, 1039–1040
`ejbActivate` method, 847, 850
`EJBContext`, 1050, 1057, 1068–1069
`ejbCreate` method
 bean-managed persistence, 905
 compared to `create` method, 878
 container-managed persistence, 945
 examples, 876, 905, 925, 945, 948
 JMS administered object lookups, 1213
 life cycles, 847, 850–851
 message-driven beans, 1007, 1215
 primary keys, 850, 935, 983
 requirements, 877
 session beans using JMS, 1224
`ejbFindByPrimaryKey` method, 909, 935
`EJBHome` interface, 878
`ejbLoad`, 1051
`ejbLoad` method, 907, 928, 931, 946
`EJBObject` interface, 879
`ejbPassivate` method, 847, 850
`ejbPostCreate` method, 850, 906, 945
`ejbRemove` method
 bean-managed persistence, 907, 932
 container-managed persistence, 946
 examples, 907
 life cycles, 848, 850–851
 message-driven beans, 1007, 1215
`ejbStore` method, 907, 946
EJB-tier security
 IOR security, configuring, 1143–1145
 method permissions, declaring, 1143
 overview, 1142
 and programmatic security, 1145
 users unauthenticated, 1145
`ejbTimeout` method, 892–893
Electronic Business XML (ebXML). *See also ebXML (Electronic Business XML).*
Element events, 124–125
Element nodes, 175

Elements, 43, 221, 230
adding attributes, 43
content, 220
definition, 1373
empty, 45, 153
events, 124
nested, 44
nesting, 44
node, 248
qualifiers, 53
root, 42
root, defining, 42–43
special values, 55
vs. attributes, 75–76
Eliminating redundancies, 77
email
 Internet mail, 18–19
 JavaMail API
 connecting to from enterprise beans, 1080–1083
 definition, 1379
 overview, 18–19
 resource manager, 1076
 mail session connections, 1080–1083
 notifications, 18–19. *See also JavaMail.*
 sending from enterprise beans, 1080–1083
`EMPTY`, 55
`empty`, JSP operator, 494
Empty collection comparison expressions, 1037
Empty elements, 153
`EMPTY` keyword, 55
Empty tags, 33–34, 1373
Encoding, 35
Encoding custom UI components, 780–782
`endDocument` method, 119
`endElement` method, 119
Enterprise application integration (EAI), 20–21
Enterprise Archive (EAR) files, 12–13, 1372. *See also packaging.*
Enterprise bean class, coding, 855–856

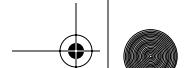


Enterprise bean classes files, 845–846
Enterprise bean JAR files, examples, 857
Enterprise beans, 6, 17, 855
See also backing beans
See also enterprise beans
See also entity beans
See also J2EE components
See also message-driven beans
See also session beans
See also transactions
abstract schema, 835–836
accessing, 840
API, 6–7
application client
 coding, 859
 compiling, 861
 creating, 858–863
enterprise bean reference, specifying, 862–863
packaging, 861–862
running, 869
application exceptions, 901–902
asynchronous message processing, 838–840
bean-managed persistence, 834
benefits of, 830
boundaries, determining, 1046
business methods. *See* business methods.
business methods, invoking, 860
coding
 application client, 859
 enterprise bean class, 855–856
 enterprise beans, 854
 home interface, 855
 remote interface, 855
 Web client, 863–864
comparing, 891
compiling, 856
 application client, 861
 enterprise bean source files, 856
 Web client, 865
container-managed persistence, 834, 835–838. *See also* CMP.
container-managed relationships

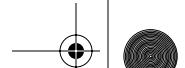
bidirectional, 837–838
definition, 834
direction, 837–838
many-to-many, 837
many-to-one, 837
multiplicity, 837
one-to-many, 837
one-to-one, 837
unidirectional, 837–838
containers, 10
contents, 845–846
conversational state, 832
ConverterClient program source code, 860–861
creating, 854–858, 960
and database interactions, 17
databases, connecting to, 1078–1080
definition, 3, 829, 1374
deployment, 845
deployment descriptor files, 845–846
development roles, 15
distribution, 843
Duke's Bank, 1309
email, sending from, 1080–1083
enterprise bean class, coding, 855–856
enterprise bean classes files, 845–846
entity beans. *See* entity beans.
environment entries, 890
establishing relationships, 966–967
exception handling, 901–902
exceptions, 901
field mappings, 968
helper classes files, 845–846
home interface, coding, 855
home interface, locating, 859–860
home interfaces. *See* home interfaces.
home methods, 990
implementor of business logic, 6
instances, creating, 860
interfaces, 840, 845
interfaces files, 845–846
intranet security, 1143–1145
IOR security, configuring, 1143–1145
J2EE applications

**INDEX****1435**

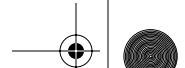
- class files, modifying, 870–871
- creating, 854
- deploying, 868–869
- deployment settings, modifying, 872
- JAR, adding files to, 871
- modifying, 870–872
- WAR, adding files to, 871
- JAR files, 13
- JavaBeans architecture, 5
- JavaMail, connecting to, 1080–1083
- and JDBC API, 21
- life cycle
 - entity beans, 848–850
 - message-driven beans, 850–851
 - stateful session beans, 847–848
 - stateless session beans, 848
- life cycles, 841, 847
- local access, 841
- local home interfaces. *See* local home interfaces.
- local interfaces. *See* local interfaces.
- lookups, 859
- mail sessions, connecting to, 1080–1083
- mapping references to JNDI names, 866
- message-driven beans
 - life cycle, 850–851
 - vs. entity beans, 838–840
 - vs. session beans, 838–840
- method permissions. *See* method permissions.
- method permissions, declaring, 1143
- modules, 13
- naming conventions, 846–847
- overview, 6–7, 17
- packaging, 857–858, 881
- passivation, 847
- performance, 842–843, 845
- persistence, 833–834
- persistent fields, 835–836
- PointBase database, connecting to, 1078–1080
- primary keys, 834
- propagating security identity, 1149–1151
- protecting, 1142
- provider, 1374
- provider/developer role, 15
- reference, specifying, 883, 899
- references, 859, 862, 866, 998–999
- references, setting, 968–971
- references, specifying, 1055–1056, 1062, 1067
- relationship fields, 836
- relationship mappings, 968
- relationships, 834
- remote access, 840
- remote interface, coding, 855
- remote interfaces. *See* remote interfaces.
- representing a single client, 831–833
- representing business objects, 833–838
- required files, 845–846
- session beans. *See* session beans.
- shared access, 834
- source files, compiling, 856
- state, 836
- state management modes, 831–832
- stateful session beans, 832, 847–848
- stateless session beans, 831–832, 848
- system exceptions, 901–902
- transactions, 1069
- transactions, bean-managed, 1057–1068
- transactions, container-managed, 1046–1057
- types, 7, 830–832
- URLs, connecting to, 1083–1086
- user access, controlling. *See* EJB-tier security.
- uses for, 830
- Web client
 - coding, 863–864
 - compiling, 865
 - context root, specifying, 868
 - creating, 863–868
 - enterprise bean reference, mapping, 867
 - enterprise bean reference, specifying, 866
 - packaging, 865
 - running, 869–870



- Enterprise beans (*Continued*)
 Web service endpoint interfaces, 844
 Web services, 831–832, 840, 843, 884
Enterprise Information Systems. *See* EIS tier.
Enterprise information systems (EIS), J2EE interaction. *See* J2EE Connector architecture.
Enterprise JavaBeans (EJB). *See* EJB.
Enterprise JavaBeans Query Language (EJB QL). *See* EJB QL.
EnterpriseBean interface, 876
Entities, 35, 222
 defining, 35, 49
 defining in DTD, 60
 definition, 1374
 external, 78
 external, echoing, 153–154
 general, 154
 identifying, 109
 included "in line," 37
 list of, 49
 parameter, 66, 155
 parsed, 63, 155
 predefined, 49
 public identifiers, 109
 reference, 77, 179, 222
 reference node, 211
 reference nodes, expanding, 212
 references, 66, 153–154, 212, 1375
 referencing binary, 64
 referencing external, 62
 resolution, SAX, 172–173
 state, inserting in database, 905–906
 summarizing, 154–155
 unparsed, 63, 155
 useful, 61
 in XML documents, 50–51
Entities, in DTDs
 binary content, 63, 64–65
 conditional sections, 66
 defining, 60–63
 external, 62–63
 general, 63
image files, 64–65
internal, 60–61, 63
MIME data types, 64–65
multimedia data files, 64–65
parameter, 66–68
parsed, 63
referencing
 binary entities, 64–66
 with entity references, 66
 external entities, 62–63
 parameter entities, 66–68
 unparsed entities, 64–66
unparsed, 63, 64–65
XML content, 63
Entity bean class, 941
Entity bean methods, 945–946
Entity beans, 7, 17, 833
 See also backing beans
 See also BMP
 See also CMP
 See also enterprise beans
 See also message-driven beans
 See also session beans
access control, 844–845
bean-managed persistence. *See* BMP.
benefits of, 17
cascading deletes, 991
collections, 1029
configuring relationships, 995–996
container-managed persistence. *See* CMP.
container-managed relationships, 842
container-managed *versus* bean-managed, 941
defining client access, 840–845
definition, 1375
deleting, 907
description, 833–838
Duke's Bank, 1306
equality, 891
examples, 890–892
finder methods, 841–842, 908–910, 914–916
garbage collection, 850
granularity of data, 844–845

**INDEX****1437**

- home interface, 841
- home methods, 841
- isolation, 844
- isolation levels, 1071
- JMS example, 1231
- life cycle, 848–850
- local clients, 841–842
- local interfaces, 842
- locating, 908–910, 912
- mapping to multiple tables, 989
- messages. *See* JMS.
- overview, 7, 17
- persistent state, 838
- primary keys. *See* primary keys.
- querying. *See* EJB QL.
- remote access vs. local, 842–843
- remote clients, 840–841
- remote interface, 841
- transaction types allowed, 1069
- transactions, 1049, 1051, 1057, 1069
- vs. message-driven beans, 838–840
- vs. session beans, 833–834
- Web service clients, 843–844
- Web service endpoint interface, 844
- ENTITY tag, 60–61
- EntityBean interface, 904
- EntityContext interface, 892, 906
- EntityResolver, 242
 - API, 172
 - EntityResolver API, 109
- Environment entries, 890
- Environment naming context, locating, 22
- eq, JSP operator, 494
- Equal sign (=), XPath operator, 253
- Equal signs (==), JSP operator, 494
- Equality semantics, 1039–1040
- Error handling. *See also* debugging; exceptions.
 - DOM, 184–185
 - DTD warnings, 163
 - error types, 139–140
 - fatal errors, 140
 - IOException, 144–145
 - JSP pages, 485–486
- nonfatal errors, 145–146
- ParserConfigurationException, 144
- SAX, 139–147, 158, 161
- SAX (Simple API for XML), 109
- SAXException, 141–143
- SAXParseException, 140–141, 143
- servlets, 443–444
- tags, 549
- warnings, 146–147
- XML, 48, 108
- Error messages, JSP, 640, 698–699
- Error page, creating, 1107–1108
- ErrorHandler API, 108
- Errors. *See also* debugging.
 - definition, 48, 1375
 - fatal, 48, 140, 1375
 - generating, 286
 - handling, 184
 - in the validating parser, 161
 - handling XML Schema errors, 158
 - mapping to error screens, 99
 - nonfatal, 145
 - types, SAX, 139–140
 - validation, 159, 187
 - warnings, 48, 146–147, 1397
- escapeXML function, 561–562
- Event and listener model, 645, 652–653, 652–653
 - action events. *See* action events.
 - ActionEvent class, 691–692
 - data model events, 653
 - Event class, 652
 - event handlers, 634, 665, 772
 - event listeners, 632, 634, 664, 666–668, 710
 - handling events of custom UI components, 788
 - implementing event listeners, 747–750
 - Listener class, 652, 755
 - queueEvent method, 783
 - value-change events. *See* value-change events.
 - ValueChangeEvent class, 722



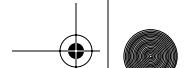
Event handling
 CDATA sections, 147–149. *See also* lexical events.
 custom UI components, 789–790
 document locator, 136–137
 DTDs, 171–172
 entity resolution, 172–173
 error handlers, 139–147, 161
 lexical events. *See also* CDATA sections.
 comment method, 164
 echoing comments, 164, 167–168
 echoing lexical information, 168–171
 identifying CDATA sections, 164
 LexicalHandler, 164–171
 processing instructions, 137–139
 special characters, 147–149
 XML files
 character events, 125–127
 document events, 123–124
 element events, 124–125

Event listeners, 591, 710–712, 747–750

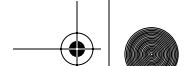
Events. *See also* lexical events.
 action, 652
 character, 125–127
 content, 123
 data-model, 653
 document, 123–124
 element, 124–125
 immediate processing, 681–682
 lexical, 164

Examples
 See also bookstore example
 See also Coffee Break
 See also online banking example
 See also SAAJ messages, tutorial
 See also session beans, examples
 access methods, 949, 976
 application clients, 333, 860
 asant, 856
 authentication
 basic, 1126–1133
 client-certificate, 1133–1142
 form-based, 1105–1114
 mutual, 1133–1142

bean-managed JDBC transactions, 1059–1063
bean-managed JTA transactions, 1064–1068
bean-managed persistence, 903, 924, 932.
 See also BMP examples.
business methods, 910, 945
classpath, 856
container-managed persistence, 939, 958, 984. *See also* CMP examples.
container-managed relationships, 940
container-managed transactions, 1053–1056
create method, 860, 876, 925
deployment descriptors, 1131
DII clients, 329
Duke's Bank. *See* online banking example
Duke's Bookstore. *See* bookstore example
durable subscriptions, 1202–1204
dynamic proxy clients, 326
EJB QL, 996, 1017, 1019–1021, 1032
ejbCreate method, 876, 905, 925, 945, 948
ejbRemove method, 907
enterprise bean JAR files, 857
entity beans, 890–892
finder methods, 909, 920, 955, 1041
guessNumber, 636, 662
home interfaces, 879, 914
image map, 765–770
iteration tags, 608–610
Java Servlet technology. *See* bookstore example
Java Web services. *See* Coffee Break example
JavaServer Faces, JSP pages, 672–675
JavaServer Faces technology. *See also* bookstore example
 building, 1297–1298
 deploying, 1297–1298
 JavaBeans components, 1288–1289
 JSP pages, 1285–1287

**INDEX****1439**

- overview, 1284–1285
- packaging, 1297–1298
- resource configuration, 1289–1290
- running, 1297–1298
- JAXR**
 - J2EE application, 425
 - simple, 417
- JAX-RPC service**
 - advertising the service, 1259–1263
 - building, 1292–1294
 - deploying, 1292–1294
 - discovering, 1282
 - packaging, 1292–1294
 - registry, deleting from, 1263–1265
 - registry, publishing to, 1259–1263
 - running, 1292–1294
 - service implementation, 1258–1259
 - service interface, 1257
- JMS**
 - asynchronous message consumption, 1183
 - durable subscriptions, 1202
 - J2EE examples, 1222, 1231, 1239, 1246
 - local transactions, 1206
 - message acknowledgment, 1194
 - synchronous message consumption, 1174
- JMS API local transactions, 1206–1211
- JSP (JavaServer Pages).** *See* bookstore example.
- JSP custom tags**
 - bookstore examples, 564–568
 - dynamic attributes, 588–589
 - fragment attributes, 586–588
 - simple attributes, 585–586, 586–588
 - variables, 572–573
- JSP documents, 516–521
- JSP expressions, 494–495
- JSP pages, 472–482, 494–495, 863
- JSP scripting elements, 618
- JSP simple tags, 608, 610
- JSP Standard Tag Library.** *See* bookstore example.
- JSP tag files, variable synchronization, 582–584
- local interfaces, 946–947, 950
- location, xl
- mapping table relationships
 - child table, entity bean, 927–929
 - child table, helper class, 923–926
 - foreign keys, 919–922
 - many-to-many, 930–933
 - one-to-many, 922–930
 - one-to-one, 919–922
- message acknowledgment, 1194–1197
- message-driven beans. *See* message-driven beans example.
- path expressions, 1032
- persistent fields, 943
- primary keys, 934, 982
- programming tag handlers, 608–616
- relationship fields, 943
- remote interfaces, 855, 879, 916
- required software, xl
- SAAJ**
 - attachments, 385
 - DOM, 381
 - headers, 380
 - request-response, 373
 - SOAP faults, 387
 - scripting, 618–619
- security
 - basic authentication, 1126
 - client-certificate authentication, 1133
 - form-based authentication, 1105
 - mutual authentication, 1133
- servlets, 436–441
- session beans, 855, 873, 890
- simple JSP pages, 84
- simple servlets, 84
- synchronous messaging, 1174
- template tag library, 610–613
- timer service, 895
- transactions, 1051–1052, 1063
- variable synchronization, tag files, 582–584
- Web applications

Examples (*Continued*)*See* Coffee Break example*See* JAXR, client examples*See* JAX-RPC, example*See* online banking example

Web clients, 863

Web services, 314, 1255

Exceptions

See also debugging*See also* error handling*See also* errors

application, 901–902

business methods, 878

create method, 879, 915

ejbCreate method, 877, 906

ejbFindByPrimaryKey method, 910

ejbRemove method, 907

enterprise beans, 901–902

javax.ejb package, 902

JMS, 1172–1173

mapping to error screens, 99

ParserConfigurationException, 144

rolling back transactions, 901,

1050–1051, 1058, 1063

SAXException, 141–143

SAXParseException, 140–141, 143

SQL, 1051

system, 901–902

transactions, 1048–1049

Exclamation point, equal sign (!=)

JSP operator, 494

XPath operator, 253

Exclamation point (!), JSP operator, 494

Executing procedures remotely. *See* JAX-RPC; RPCs.

Expiration of JMS messages, 1198

JMSExpiration message header field,
1170

Explicit collaboration, 542–543

Expression evaluation tags, 549

Expression language, JSP pages

arithmetic operators, 494

conditional operators, 494

deactivation, 490, 511–512

examples, 494–495

functions, 496–497

implicit objects, 492–493

literals, 493

logical operators, 494

null values, determining, 494

operators, 493–494

overview, 489–490

relational operators, 494

reserved words, 494

using expressions, 490–491

variables, 491–492

Expressions

JSP documents, 530

scripting, 622–623

XPath, 247–248, 250–251

Extended document XML standards, 1353

Extensible Markup Language (XML). *See* XML.Extensible Stylesheet Language (XSL),
1347, 1400Extensible Stylesheet Language Transformations (XSLT). *See* XSLT.External data sources, binding to component
values, 683, 714–718

External entities, 62–63, 153–154, 1375

External subsets, 1375

F

Faces request, 663–664

Faces response, 663–664

FacesMessage, 743–744

FacesServlet, 813–814

false function, 256

Fatal errors, 48, 140, 1375

Faults, SOAP. *See* SOAP faults.File extensions. *See specific extensions.*

file realm, 1088–1089

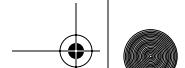
Filter chains, 303–310, 455, 460, 1375

as concatenated transformations, 303

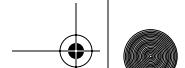
in XSLT, operation of, 307

Filter interface, 454–456

Filter mappings, 458–460

**INDEX****1441**

- FilterChain interface, 454–456
- FilterConfig interface, 454–456
- Filtering requests and responses, 454
- Filters, 454–456, 1375
 - defining, 454
 - mapping to Web components, 458
 - mapping to Web resources, 458–460
 - overriding request methods, 457
 - overriding response methods, 457
 - response wrappers, 456
- findAncestorWithClass method, 606
- findByPrimaryKey method, 929, 949, 952
- findClassificationSchemeByName
 - method, 406, 413
- findConcepts method, 402
- Finder methods, 990
 - bean-managed persistence, 908
 - compared to select methods, 944
 - container-managed persistence, 941, 990
 - creating, 914–916
 - defining, 946–947
 - definition, 1376
 - deploytool, 978
 - description, 908–910, 944
 - EJB QL, 1017
 - entity and session beans, 841
 - examples, 909, 920, 955, 1041
 - home interfaces, 915
 - local home interfaces, 946
 - returning collections, 926
 - transactions, 1049
- findOrganization method, 400
- floor function, 256
- Flow control tags, 545–547, 552–553
- For-each loops, 301
- forEach tag
 - core library, 544, 547
 - XML library, 550, 552–553
- Foreign keys, 919–922, 987
- Foreign language support. *See* internationalization; localization.
- form tag, 639
- formatDate tag, 554, 556
- formatNumber tag, 554, 556
- Formatting Objects standard, 246
- Formatting tags, 556
- FormatValidatorTag class, 754
- Form-based authentication
 - configuring, 1097–1098
 - definition, 1376
 - example, 1105–1114
 - overview, 1101–1102
 - protecting passwords, 1113–1114
 - and SSL support, 1113–1114
- Forms, user input, 683–684
- forTokens tag, 544, 547
- forward method, 462
- Fragment attributes, 569–570, 584–588
- Fragments, JSP, 569–570
- Framework roles, 634–635
- Fraudulent transmission of information, 20.
 - See also* JAX-RPC.
- FROM clause, 1027–1030
- Fully qualified names, 349
- Functional expressions, 1037–1038
- Functions. *See also* specific functions.
 - arithmetic (numeric), 256
 - Boolean, 256
 - boolean, 256
 - ceiling, 256
 - concat, 255
 - contains, 255
 - conversion, 256
 - count, 254
 - false, 256
 - floor, 256
 - JSP pages, 496–497
 - lang, 256
 - last, 254
 - local-name, 257
 - name, 257
 - namespace, 257
 - namespace-uri, 257
 - node-set, 254
 - normalize-space, 255
 - not, 256
 - number, 256
 - numeric, 256

Functions (*Continued*)

position, 254
positional, 254
round, 256
starts-with, 255
string, 255
string, 256
string-length, 255
substring, 255
substring-after, 255
substring-before, 255
sum, 256
translate, 255
true, 256
XPath, 253–257

Functions library, 541–542, 561–562

G

Gamma, Erich, 457
Garbage collection, 850–851
ge, JSP operator, 494
General entities, 63, 154, 1376
Generate-wsdl task, 317–318
GenericServlet interface, 436
getAttachments method, 360
getBody method, 348
getCallerPrincipal method, 1145
getConnection method, 101, 1077
getEJBObject method, 906
getEnvelope method, 348
getHeader method, 348
getInfo method, 894
getJspBody method, 602
getJspContext method, 604
getNextTimeout method, 894
getObject method, 892
getParameter method, 449
getParent method, 606
getParser method, 121
getPrimaryKey method, 906, 936
getRemoteUser method, 1098
getRequestDispatcher method, 461
getRollbackOnly method, 1218

getServletContext method, 463

getSession method, 464
getSOAPBody method, 348
getSOAPHeader method, 348
getSOAPPart method, 348
Getters. *See* access methods.
getTimeRemaining method, 894
Getting, 81
getUserPrincipal method, 1098
getValue method, 354
getVariableInfo method, 605
GIF files, 13
Granularity of data, 844–845
Graph (tree) of beans, 799–801
Greater than, equal (>=)

JSP operator, 494
XPath operator, 253

Greater than (>)

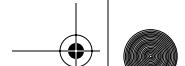
entity for, 49
JSP operator, 494
XPath operator, 253

Greater than entity, >, 49

Groups, 1088
definition, 1088–1089, 1376
overview, 1088–1089
roles, mapping, 1090–1092
>, greater than entity, 49
gt, JSP operator, 494
GUI tools, list of, 26

H

Handles, 1376
Handling events. *See* event and listener model.
Hash mark (#), in character references, 50
header object, 492
HeaderExample.java, 380–381
Headers, SAAJ messages, 355–356, 380–381
headerValues object, 493
Headings, XML to HTML, 285
Helper classes, 845, 880, 923
Duke's Bank, 1307



INDEX

1443

- Helper classes files, 845–846
Hexadecimal to decimal conversion, 50
Hiding user input, 694
Hierarchical nature of XML, 38
Hierarchy, collapsed, 225
Home handles, 1376
Home interfaces, 878, 914
 coding, 855
 defined, 841
 definition, 1376
 description, 878–879
 entity and session beans, 841
 examples, 855, 879, 914
 home methods, 913
 locating, 859–860, 863
Home methods, 912, 915
 container-managed persistence, 990
 creating, 914–916
 defining, 946–947
 description, 912–913
 entity and session beans, 841
HTML (Hypertext Markup Language), 31
 component tags, 680–681
 definition, 1376
 files, module type, 13
 pages. *See also* JSP pages; Web components.
 overview, 6
 transforming XML to. *See* XPath; XSLT
HTMLReaderBean example, 1085–1086
HTML-style tags, 44–45
HTTP (Hypertext Transfer Protocol), 313–314, 1133
 basic authentication. *See* basic authentication.
 definition, 1376
 digest authentication. *See* digest authentication.
 over SSL, 1102, 1133. *See also* client-certificate authentication.
 request-and-response model, 11. *See also* SOAP.
 requests, 1356
 responses, 1356
 setting proxies, 398
HTTP protocol, 1355
HTTP request URLs, 449
 query strings, 450
 request paths, 449
HTTP requests, 449, 1356. *See also* requests.
 methods, 1356
HTTP responses, 451, 1356. *See also* responses.
 status codes, 99, 1356
 mapping to error screens, 99
HTTPS, 1116, 1122, 1377
HttpServlet interface, 436
HttpServletRequest, 1098
HttpServletResponse interface, 449, 1098
HttpSession interface, 464
Hyperlinks, 686
Hypertext Markup Language (HTML). *See* HTML.
Hypertext Transfer Protocol (HTTP). *See* HTTP.
Hyphen (-), in XML markup, 43
Hyphenation hierarchies, DTDs, 70

I

- <I> (italics) tag, 280
I18n. *See* internationalization.
ICE (Information and Content Exchange), 1354
id attribute, 681
Identification, 1088
Identity transform, 260
IDL (Interface Definition Language), 1377
if tag, 544, 545, 550
ignorableWhitespace method, 151–152
IGNORE keyword, 69
Ignored, 145
IIOP (Internet Inter-ORB Protocol), 1377
Image file entities, 64–65
Image map example
 application classes, summary, 770
 configuring model data, 769–770
 JavaServer Faces technology for, 765–766

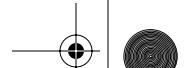
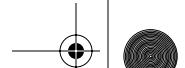


Image map example (*Continued*)
 JSP page, 767–768
 rendered HTML, 766–767
Images, displaying, 690
immediate attribute, 681–682
Impersonation, 1377
Implementation-specific parameters, 12–14
Implicit collaboration, 542–543
Implicit includes, 512–513
Implicit objects, 717
 binding to component values, 717–718
 JSP pages, 488, 492–493
 referencing, 796–797
import tag, 544, 548
IN expressions, 1035
Inbound contracts, 1361–1362
include directive, 506
INCLUDE keyword, 69
include method, 461
Indent options, XML to HTML, 290–291
Independent software vendor (ISV), 1377
indexOf function, 561–562
Information and Content Exchange (ICE), 1354
Information model, JAXR, 390, 392
Inheritance, EJB QL, 1044
init method, 447
InitialContext interface, 22
Initialization parameters
 definition, 1377
 referencing, 796–797
 setting, 98–99
Initializing
 array properties, 799
 instance variables, 905–906
 JSP pages, 620–621
 list properties, 799
 lists, 801–802
 managed bean properties, 799–801
 map properties, 797–798
 maps, 801–802
 properties, 795–796
 servlets, 447–453
Initializing properties with the managed-property element

initializing Array and List properties, 799
initializing managed-bean properties, 799
initializing Map properties, 797
initializing maps and lists, 801
referencing an initialization parameter, 796
initParam object, 493
Inline (content) elements, 296–302
Inline reusability, XML, 37
Inline tags, 280, 296
Input forms, user interface, 639
inputSecret tag, 694
inputText tag, 639, 691–692
Installing applications, 16
Instance variables
 initializing, 905–906
 refreshing, 907–908
 storing, 907–908
 synchronizing, 1052–1053
Instructions, processing, 35, 46, 137
Integrity, 1114
Interface Definition Language (IDL), 1377
Interface files, 845–846
Internal entities, 60–61, 63
Internationalization, 819. *See also* localization.
 application clients, Duke's Bank, 1327
 JavaServer Faces applications
 basename, 704
 FacesContext.getLocale method, 708
 FacesMessage class, 742
 getMessage(FacesContext, String, Object) method, 743, 753
 loadBundle tag, 680, 704–705
 locale attribute, 677
 localizing messages, 742–744
 message factory pattern, 742
 MessageFactory class, 743, 752
 performing localization, 741–744
 queuing messages, 758
 using localized static data and messages, 703



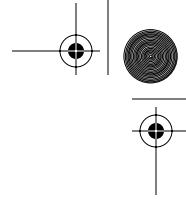
INDEX

1445

- using the `FacesMessage` class to create a message, 743
- JSTL tag library, 554–556
- locale, establishing, 821
- localization context, 554
- online banking example, 1327–1328
- Web clients, Duke's Bank, 1327
- Internationalization library, 541–542, 554–556
- Internet Inter-ORB Protocol (IIOP), 1377
- Internet mail, 18–19. *See also* JavaMail.
- Internet RPCs, 19. *See also* JAX-RPC.
- Interoperability, 11, 19. *See also* J2EE Connector architecture.
- Intranet security, 1143–1145
- `invalidate` method, 466
- Inventory and ordering example. *See* CMP examples, inventory and ordering.
- Invoke application phase, 668
- `invoke` method, 602
- `IException`, 144–145
- IOR security, configuring, 1143–1145
- `isCallerInRole` method, 1145
- `isIdentical` method, 891
- ISO 3166, 1377
- ISO 3166 country codes, 400
- ISO-8859-1 encoding, 1341
- Isolation, entity and session beans, 844
- Isolation levels, 1070
- Isolation levels, transactions, 1070–1071
- `isThreadSafe`, 488
- `isUserInRole` method, 1098
- ISV (independent software vendor), 1377
- `<ITEM>` element, 281, 293
- Iterating over objects in the data source, 686–689
- Iteration tags, 547, 608–610
- `IterationTag` interface, 623
- applications. *See also* applications.
- class files, modifying, 870–871
- creating, 854
- definition, 1377
- deploying, 868–869
- deployment settings, modifying, 872
- JAR, adding files to, 871
- modifying, 870–872
- security roles, 1090–1092. *See also* roles; security.
- WAR, adding files to, 871
- clients, 4–5
- components
- definition, 1377
 - overview, 3–8
 - versus* standard Java classes, 3–4
- definition, 1378
- EIS interaction. *See* J2EE Connector architecture.
- groups, 1089
- modules, 1378
- Platform APIs. *See* APIs.
- product, 1378
- product provider, 1378
- product provider role, 14
- security model, 8. *See also* containers; security.
- server
- components that run on, 2
 - as a container, 10
 - definition, 1378
- server communications, 5–6
- users, 1088
- J2EE 1.4 platform, APIs, 16
- J2EE applications, 2. *See also* online banking example.
- debugging, 28–29
- deploying, 868, 883, 888, 899
- iterative development, 870
- JAXR example, 425
- JMS examples, 1222, 1231, 1239, 1246
- running on more than one system, 1239, 1246
- tiers, 2

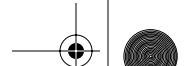
J

- J2EE (Java 2 Platform, Enterprise Edition)
- 1.4 APIs, 16–17. *See also* APIs.
- 1.4 platform implementation, 23–29. *See also* Application Server.

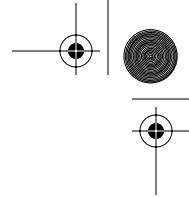


J2EE clients, 4
application clients, 5. *See also* application clients.
Web clients, 4, 81. *See also* Web clients.
Web clients *versus* application clients, 5
J2EE components, 3
connecting to databases, 1078
connecting to mail sessions, 1081
connecting to URLs, 1083
mapping resource references to data sources, 1079
mapping resource references to mail sessions, 1082
mapping resource references to URL connections, 1085
sending email, 1080
specifying resource references, 1079, 1082, 1085
types, 3
J2EE Connector architecture, 1357
CCI, 1362
CCI (Common Client Interface), 1362–1363
connection management contract, 1361
inbound contracts, 1361–1362
life-cycle management contract, 1359–1360
management contracts, 1359–1360
messaging contract, 1361
messaging contracts, 1361
outbound contracts, 1360–1361
purpose of, 1357
RAR (Resource Adapter Archive) files, 1357
resource adapter contracts, 1359–1362
resource adapters. *See* resource adapters.
security management contract, 1361
thread management, 1360
transaction inflow, 1362
transaction management contract, 1361
work management contract, 1359–1360
J2EE groups, 1089–1090
J2EE modules, 12–13
application client modules, 13
EJB modules, 13, 845

resource adapter modules, 13, 1357
Web modules. *See* Web modules.
J2EE platform, 1–2
JMS and, 1156
J2EE security model, 8
J2EE servers, 10
J2EE transaction model, 8
J2ME (Java 2 Platform, Micro Edition), 1378
J2SE (Java 2 Platform, Standard Edition), 324, 1378
J2SE SDK, 324
JAAS (Java Authentication and Authorization Service), 22
JACC (Java Authorization Contract for Containers), 1151
JAF (JavaBeans Activation Framework), 19
.jar file extension, 13
JAR (Java archive) files. *See also* EJB JAR files.
adding files to, 871
definition, 1378
including, 816–817
`j2ee.jar`, 856
overview, 12–14
viewing settings, 974–980
Java
encoding schemes, 1341–1342
IDL, 1379
interfaces, 13
pluggability layer, 105
processing XML data. *See* JAXP.
Java 2 Platform, Enterprise Edition (J2EE).
See J2EE.
Java 2 Platform, Micro Edition (J2ME), 1378
Java 2 Platform, Standard Edition (J2SE), 324, 1378
Java API for XML Processing (JAXP). *See* JAXP.
Java API for XML Registries (JAXR). *See* JAXR.
Java API for XML-based RPC (JAX-RPC).
See JAX-RPC.
Java archive (JAR) files. *See* JAR files.

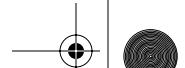
**INDEX****1447**

- Java Authentication and Authorization Service (JAAS), 22
- Java Authorization Contract for Containers (JACC), 1151
- Java beans
- See* backing beans
 - See* enterprise beans
 - See* entity beans
 - See* message-driven beans
 - See* session beans
- Java classes
- logging messages, 28
 - Server Log, overview, 28
 - `System.out.println` method, 28
- Java Message Service (JMS). *See* JMS.
- Java Message Service (JMS) API. *See* message-driven beans.
- Java Naming and Directory Interface (JNDI). *See* JNDI.
- Java Platform Debugger Architecture (JPDA), 29. *See also* debugging.
- Java Plugins. *See* applet containers; applets.
- Java Secure Socket Extension (JSSE), 1379
- Java servlet technology, 18. *See also* servers.
- Java servlets. *See* servlets.
- Java System Application Server. *See* Application Server.
- Java Transaction API (JTA). *See* JTA.
- Java Transaction Service (JTS), 1379
- Java WSDP Registry Server, 390–391
- JavaBeans Activation Framework (JAF), 19
- JavaBeans components, 5, 326, 497
 - creating in JSP pages, 499
 - definition, 1379
 - design conventions, 497
- Duke's Bank, 1319
- JAX-RPC, 325
- JSP pages
 - creating, 499
 - custom tags, 502–506
 - design conventions, 497–498
 - properties, getting, 502
 - properties, setting, 500–502
- tag libraries, declaring, 503–505
- tag libraries, definition, 502–503
- tag libraries, including, 505–506
- using, 499
- methods, 497
- overview, 5
- properties, 497–498
 - retrieving in JSP pages, 502
 - setting in JSP pages, 500
- using in JSP pages, 499
- in WAR files, 86
- `java:comp/env context`, 22
- JavaMail, 18
 - connecting to from enterprise beans, 1080–1083
 - definition, 1379
 - overview, 18–19
 - resource manager, 1076
- JavaMail resources. *See* mail sessions.
- JavaServer Faces, 24
 - application architects, 635
 - application developers, 634–635
- backing beans
 - binding component values and instances, 657–659
 - configuring, 643–644
 - creating, 659
 - definition, 634
 - developing, 642–643
 - managing, 656–659
 - method-binding, 657
 - storing, 659
 - value-binding, 657
- benefits of, 633
- component relationships, 659–662
- component writers, 635
- data validation, 640, 654
- definition, 1380
- development team, 634–635
- example
 - building, 1297–1298
 - deploying, 1297–1298
- JavaBeans components, 1288–1289
- JSP pages, 1285–1287

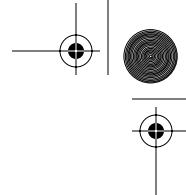


JavaServer Faces (*Continued*)
overview, 1284–1285
packaging, 1297–1298
resource configuration, 1289–1290
running, 1297–1298
expression language, 1380
framework roles, 634–635
navigation model, 654–656, 1380
overview, 24–25, 631–632
page authors, 634–635
page life cycle
 faces request, 663–664
 faces response, 663–664
 invoke application phase, 668
 non-faces request, 663–664
 non-faces response, 663–664
 overview, 662
 process validations phase, 666–667
 render response phase, 668–669
 request processing, 663–665
 request values phase, 666
 update model values phase, 667–668
 view phase, 665–666
 views, 662
standard HTML render kit library, 648, 676, 808
`html_basic` TLD, 676
UI component tags. *See* UI component tags.
standard HTML RenderKit library,
 `html_basic` TLD, 777
tools vendors, 635
UI component class, 1380
UI components, 1380
user interface component model
 action events, 652
 behavioral interfaces, 646–647
 classes, 645–646
 component rendering model, 647–651
 conversion model, definition, 1380
 conversion model, description, 651–652
 data validation, 654
 data-model events, 653

event and listener model, definition, 1380
event and listener model, description, 652–653
mapping classes to tags, 647–651
overview, 644–645
render kit, 647
tags, list of, 648–651
`UICommand` class, definition, 645
`UICommand` class, tags, 648
validation model, 654
 value-change events, 653
validation model, 1380
JavaServer Faces, application configuration
 application configuration resource files
 description, 792
 making available, 792–793
 specifying path to, 814–815
 backing beans, configuring
 array properties, initializing, 799
 custom converters, registering, 804–805
 custom validators, registering, 803–804
 graph (tree) of beans, 799–801
 implicit objects, referencing, 796–797
 initialization parameters, referencing, 796–797
 initializing properties, 795–796
 instances of `List`, 795
 instances of `Map`, 795
 list properties, initializing, 799
 `list-entries` element, 795
 lists, initializing, 801–802
 managed bean properties, initializing, 799–801
 managed-bean element, 793–795
 managed-bean-class element, 794
 managed-bean-scope element, 794
 managed-property element, 795–796
 map properties, initializing, 797–798
 `map-entries` element, 795, 797–798
 maps, initializing, 801–802
 messages, registering, 802–803
 overview, 793

**INDEX****1449**

- backing beans, creating, 793–802
- basic requirements, 811–817
- classes, including, 817
- component access, restricting, 815–816
- custom components, registering, 810–811
- custom objects, verifying, 816
- custom renderer, registering, 808–810
- `deploytool` utility, 812–816
- `FacesServlet`, 813–814
- JAR files, including, 816–817
- life cycle processing, 813–814
- managed bean creation facility, 793–802
- navigation rules, configuring, 805–808
- pages, including, 817
- state, specifying save location, 815
- WAR files, 811–812
- XML file validation, enabling, 816
- JavaServer Faces, application development
 - `ActionListener` class, 749–750
 - backing bean methods
 - `ActionEvent`, 749, 757
 - navigation, 755–757
 - overview, 755
 - validation, 757–758
 - `ValueChangeEvent`, 748, 758–759
 - component properties
 - bound to component instances, 739–740
 - bound to component values, 730–739
 - `FacesMessage`, 743–744
 - localization, 741–744
 - message factory, 743
 - overview, 730
 - resource bundles, 741, 743–744
 - `UIData`, 732–733
 - `UIInput`, 731–732
 - `UIOutput`, 731–732
 - `UISelectBoolean`, 734
 - `UISelectItem`, 736
 - `UISelectItems`, 737–739
 - `UISelectMany`, 734–735
 - `UISelectOne`, 735–736
 - user input, selecting from a list, 734–739



JavaServer Faces, custom UI components
(Continued)

- JavaServer Faces technology for, 765–766
- JSP page, 767–768
- rendered HTML, 766–767
- overview, 761–762
- renderer class, 786–788
- renderer type, identifying, 788
- renderers, determining need for, 763–764
- rendering, delegating, 786–788
- state, saving and restoring, 785–786
- tag handlers, creating, 772–776
- TLD (tag library descriptor), 777

JavaServer Faces, expression language, 657

- method-binding expressions. *See* method binding; method-binding expressions.
- value-binding expressions. *See* value binding; value-binding expressions.

JavaServer Faces, JSP pages

- action processing, 684–686
- backing bean methods, referencing navigation methods, 720–721
- overview, 719–720
- validation methods, 722
- binding component instances to bean properties, 718–719
- bean values, 683
- binding component values to external data sources, 683, 714–718
- implicit objects, 717–718
- properties, 715–716
- binding data to objects, 686–689
- component identification, 681
- conversions, immediate processing, 681–682
- converters, 705–710
- core tags, 678–680
- CSS styles, specifying, 683
- custom objects
 - components, 726–727
 - converters, 724

JavaServer Faces, standard UI components, 761

overview, 723–724

- validators, 725–726

data columns, 684

data tables, 694–696

data validation, 714

date conversion, 707–709

error messages, 698–699

event listeners, 710–712

events, immediate processing, 681–682

example, 672–675

HTML component tags, 680–681

hyperlinks, 686

images, displaying, 690

iterating over objects in the data source, 686–689

localized messages, 703–705

number conversions, 709–710

registering listeners on components, 710–712

rendering components, 682

requiring values, 712–714

setting up, 676–678

tables, data, 694–696

text labels, 690–694

time conversion, 707–709

UI component tag attributes, 681–683

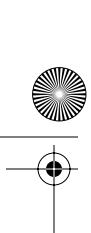
user input

- buttons, 685
- checkboxes, 697–698, 703–704
- combo boxes, 699–700, 703–704
- drop-down lists, 699–700, 703–704
- forms, 683–684
- hiding, 694
- list boxes, 697–698, 703–704
- menus, 697–698, 699–700, 703–704
- requiring values, 712–714
- text fields, 690–694
- validation, 714

user output, 690–694

validations, immediate processing, 681–682

validators, 712–714





INDEX

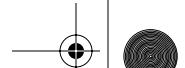
1451

- UIColumn component, 684, 686
- UICommand component, 684–685, 711
- UIComponent component, 746
- UIData component, 684, 686, 688–689, 733
- UIData components, 732
- UIForm component, 683
- UIGraphic component, 690
- UIInput component, 690–691, 711, 713, 719, 723, 731, 733, 747, 751
- UIMessage component, 698
- UIMessages component, 698
- UIOutput component, 679, 683, 690–691
- UIPanel component, 694
- UISelectBoolean component, 734
- UISelectItem component, 735–736
- UISelectItems component, 700, 735, 737
- UISelectMany component, 679, 700, 734, 736–737
- UISelectOne component, 679, 700, 736–737
- UISelectOne properties, 735
- UIViewRoot component, 765
- JavaServer Faces application development
 - roles
 - application architects, 635, 721, 744, 750, 772, 791
 - application developers, 634, 647, 729, 732
 - component writers, 635
 - page authors, 634, 647, 671, 710–711, 723–724, 729, 744, 750
 - tools vendors, 635
- JavaServer Faces core tag library, 654, 676
 - action attribute, 685
 - actionListener tag, 678, 710–712, 763
 - attribute tag, 678
 - convertDateTime tag, 678, 707
 - convertDateTime tag attributes, 708
 - converter tag, 678, 706–707, 723–724
 - converterId attribute, 706–707, 724
 - convertNumber tag, 678, 707, 709
 - convertNumber tag attributes, 709
 - facet, 688
- facet tag, 678, 680, 688, 696
- id attribute, 725
- jsf_core TLD, 676, 680
- loadBundle tag, 679–680, 704
- maximum attribute, 714
- minimum attribute, 714
- param tag, 679–680, 693, 717
- parseLocale attribute, 708
- selectItem tag, 650, 680, 698, 700–703
- selectItem tag, 679, 700
- selectItems tag, 650, 680, 698, 700–703
- selectItems tag, 679, 700
- subview tag, 677, 679–680
- type attribute, 711–712
- validateDoubleRange tag, 679, 712
- validateLength tag, 679, 712
- validateLongRange tag, 640, 679, 712, 714
- validator tag, 654, 679, 723, 725, 750, 753
- validator tags. *See* validator tags.
- valueChangeListener tag, 678, 710–711
- verbatim tag, 679–680, 693
- view tag, 676–677, 679–680
- JavaServer Faces tag libraries, 634
 - JavaServer Faces core tag library, 678–680
 - JavaServer Faces standard HTML render kit tag library. *See* JavaServer Faces, standard HTML render kit library.
- taglib directives, 676, 724
- JavaServer Faces technology, 631
 - advantages of, 633
 - backing beans. *See* backing beans.
 - component rendering model. *See* component rendering model.
 - configuring applications. *See* configuring JavaServer Faces applications.
 - conversion model. *See* conversion model.
 - event and listener model. *See* event and listener model.
- FacesContext class, 663, 665–667, 669, 727, 743, 745–746, 751, 753, 758, 765, 767, 781

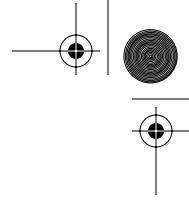


JavaServer Faces technology (*Continued*)
 FacesServlet class, 637, 663–664,
 812–814
 jsf-api.jar file, 816
 jsf-impl.jar file, 816
 life cycle. *See* life cycle, JavaServer Faces
 pages.
 navigation model. *See* navigation model.
 roles. *See* JavaServer Faces application
 development roles.
 tag libraries. *See* JavaServer Faces tag
 libraries.
 UI component behavioral interfaces. *See*
 UI component behavioral inter-
 faces.
 UI component classes. *See* UI component
 classes.
 UI component tags. *See* UI component
 tags.
 UI components. *See* JavaServer Faces,
 standard UI components.
 validation model. *See* validation model.
JavaServer Pages (JSP). *See* JSP.
JavaServer Pages Standard Tag Library. *See*
 JSTL.
JavaServer Pages Standard Tag Library
 (JSTL). *See* JSTL.
JavaServer Pages technology, 471. *See also*
 JSP pages.
JavaServer Pages (JSP) technology, 18. *See*
 also JSP pages.
javax.activation.DataHandler class,
 359–360
javax.naming.InitialContext objects,
 22
javax.servlet package, 435
javax.servlet.http package, 435
javax.servlet.jsp.tagext, 598
javax.servlet.jsp.tagext package,
 623–624
javax.xml.registry package, 392
javax.xml.registry.infomodel
 package, 392
javax.xml.registry.lifecycleMan-
 agerURL connection property, 397

javax.xml.registry.postalAddressS-
 cheme connection property, 397,
 415
javax.xml.registry.queryManagerURL
 connection property, 397
javax.xml.registry.secu-
 rity.authenticationMethod
 connection property, 397
javax.xml.registry.semanticEquiva-
 lences connection property, 397,
 415
javax.xml.registry.uddi.maxRows
 connection property, 397
javax.xml.soap package, 339
javax.xml.transform.Source interface,
 356
JAXM specification, 340
JAXP (Java API for XML Processing), 19
 definition, 1379
 libraries, 106, 113
 overview, 19
 transformation packages, 246–247
JAXP 1.2, 176
JAXR (Java API for XML Registries), 20,
 389
 adding
 classifications, 406
 service bindings, 407
 services, 407
 architecture, 391–393
 capability levels, 390
 client examples
 classification schemes, 421–423
 compiling, 420
 deleting concepts, 424–425
 overview, 417–418
 postal addresses, 422–423
 pre-compile requirements, 418–420
 publishing, 421–424
 registry objects, listing, 424–425
 running, 420–425
 clients, 391, 393
 clients, definition, 391, 1381

**INDEX****1453**

- clients, implementing
 - classifications (taxonomies), 401–403, 406, 412–416
 - connections, 393–403
 - organizations, 400–408
 - registries, 394–395, 399–400, 404–411
 - service bindings, 403, 407–410
- clients, in J2EE applications
 - application client, 426–427, 430, 432–433
 - application server, starting, 429
 - certificates, importing, 428–429
 - JAXR resources, creating, 429–430
 - JNDI names, checking, 432–433
 - `MyAppClient.java` class, 426–427
 - overview, 425–426
 - packaging the session bean, 431
 - PubQuery session bean, coding, 427
 - source files, compiling, 427–428
- creating connections, 395
 - defining taxonomies, 412
 - definition, 390, 1379
 - establishing security credentials, 404
 - finding classification schemes, 406
 - information model, 390
 - interfaces, 392
 - J2EE application example, 425
 - organizations
 - creating, 404
 - publishing, 408
 - removing, 411
 - overview, 20, 389–393
 - packages, 392
 - provider, 391, 1381
 - provider, definition, 391
 - publishing
 - specification concepts, 408
 - WSDL documents, 408
 - querying a registry, 399
 - resource adapter, JNDI subcontexts for, 1076
 - resources, creating, 429–430
 - specification, 390
 - specifying postal addresses, 414
 - submitting data to a registry, 404
- JAX-RPC (Java API for XML-based RPC), 19. *See also examples, authentication.*
- arrays, 325
- clients, 326
 - application, 333–336
 - creating, 314–324
- DII (dynamic invocation interface), 329–333
 - dynamic proxy, 326–329
 - generating stubs, 323
 - unknown until runtime, 329–333
- WSDL configuration files, 323
- clients, invoking stubs, 321
- compile-service task, 317
- creating the WSDL, 317–318
 - defined, 313
 - definition, 1379
 - deploying, 320–321
- example
 - advertising the service, 1259–1263
 - building, 1292–1294
 - deploying, 1292–1294
 - discovering, 1282
 - packaging, 1292–1294
 - registry, deleting from, 1263–1265
 - registry, publishing to, 1259–1263
 - running, 1292–1294
 - service implementation, 1258–1259
 - service interface, 1257
- generate-wsdl task, 317–318
- J2SE SDK classes, 324
 - Java types supported, 324–326
 - JavaBeans components, 325–326
 - mapping files, 317
 - overview, 19–20
 - packaging, 318–320
 - primitives, 325
- SEI (service element endpoint), 315, 316–318
- service endpoint interface, interface configuration files, 318
- service endpoint interfaces, 315
 - conformance rules, 316
- setting the port, 314

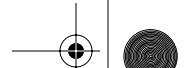


JAX-RPC (*Continued*)
SOAP interoperability, 337
specification, 337
specifying the endpoint address, 320
static stub client, 321–324
supported types, 324
value types, 325
Web services, 314–324, 337
WSDL files, 317, 323
WS-I (Web services interoperability), 337
JDBC, 21, 100, 1077
accessing databases from Web applications, 100–101
data sources, 1329
definition, 1381
overview, 21
resource connections, 1077
resource manager, 1076
resources, 1077. *See* data sources.
transactions, 1058–1061, 1069. *See* transactions, JDBC.
JDOM, 117, 178, 1345–1346
JEditorPane class, 190
JEditPane class, 193
JMS (Java Message Service) API, 18
achieving reliability and performance, 1191
administered objects
creating, 1007–1008, 1178–1180
in J2EE applications, 1213
for multiple systems, 1188–1189
programming model, 1158, 1163
removing, 1009
synchronous message receives, 1178–1180
applications, 1381
architecture, 1158–1161
asynchronous message consumption
compiling, 1185
JMS provider, starting, 1185
message listener, 1184–1185
overview, 1183
packaging, 1185–1186
receiving program, 1184

running, 1186–1187
sending program, 1183–1184
writing the programs, 1183–1185
asynchronous messages, 1155, 1161
basic concepts, 1157
client applications, 1173
asynchronous message consumption, 1183–1187
connection factory, deleting, 1191
JMS administered objects, for multiple systems, 1188–1189
overview, 1173
running, 1187–1191
server, stopping, 1191
synchronous message receives, 1174–1183
client applications, robustness
durable subscriptions, 1200–1204
local transactions, 1204–1211
message acknowledgment, 1193–1197
message expiration, 1198–1199
message persistence, 1197
message priority levels, 1198
overview, 1191–1192
reliability mechanisms, advanced, 1200–1211
reliability mechanisms, basic, 1193–1199
clients, definition, 1158, 1381
common programming interfaces, 1160–1161
definition, 1154–1155, 1379
durable subscriptions, 1160
introduction, 1154
in J2EE applications
application clients, 1219
JMS administered objects, 1213
message-driven beans, 1214–1216
messages, 1212–1213
resource management, 1213
transactions, 1213, 1216–1219
Web components, 1219
in J2EE applications, examples
consuming messages, 1239–1245

**INDEX****1455**

- deploying a message-driven bean, 1245–1254
- messages from entity beans, 1231–1239
- messages from session beans, 1222–1230
- J2EE examples, 1003, 1221–1222, 1231, 1239, 1246
- J2EE platform, 1156, 1212
 - and the J2EE platform, 1156–1157
- message consumption, 1161
- message listener, 7. *See also* message-driven beans.
- messages, definition, 1158
- messaging, definition, 1154
- messaging domains, 1159–1161
- overview, 18, 1154–1157
- point-to-point messaging domain, 1159–1160
- programming model, 1162
 - administered objects, 1158, 1163, 1381
 - connection factories, 1163–1164
 - connections, 1165
 - exception handling, 1172–1173
 - message bodies, 1171–1172
 - message consumers, 1167–1168
 - message headers, 1170
 - message listeners, 1168–1169
 - message producers, 1166–1167
 - message properties, 1171
 - message selectors, 1168–1169
 - messages, 1169–1170
 - overview, 1162
 - sessions, 1165–1166
- providers
 - asynchronous message consumption, 1185
 - connections, 1165
 - definition, 1158, 1381
 - starting, 1177
 - synchronous message receives, 1177
- publishing/subscribe messaging domain, 1160
- reliability, 1155
- resource manager, 1076
- sessions, 1381
- synchronous message receives
 - compiling, 1177
 - in J2EE applications, 1212–1213
- JMS administered objects, creating, 1178–1180
- JMS providers, starting, 1177
- overview, 1174
- packaging, 1181
- receiving program, 1176–1177
- running, 1182–1183
- sending program, 1174–1176
- synchronous messaging, 1174
 - writing the programs, 1174–1177
- synchronous messages, 1161
- uses for, 1155–1156
- JMSCorrelationID** message header field, 1170
- JMSDeliveryMode** message header field, 1170
- JMSDestination** message header field, 1170
- JMSException** class, 1172
- JMSExpiration** message header field, 1170
- JMSMessageID** message header field, 1170
- JMSPriority** message header field, 1170
- JMSRedelivered** message header field, 1170
- JMSReplyTo** message header field, 1170, 1250
- JMSTimestamp** message header field, 1170
- JMSType** message header field, 1170
- JNDI (Java Naming and Directory Interface), 21, 859, 1075–1076
 - connection factory subcontexts, 1076
 - data source naming subcontexts, 22
 - definition, 1379
 - deploytool**, 867, 973
 - enterprise bean naming subcontexts, 22
 - environment naming contexts, 22
 - looking up JMS administered objects, 1163
 - lookup** method, 859, 1075–1076

**JNDI (Continued)**

lookup services, 8
names
 checking, 432–433
 reviewing, 973–974, 1335–1338
 specifying, 1013–1014
names, Duke's Bank, 1335, 1338
namespace collisions, avoiding, 1076
naming and directory services, 22
naming context, 859, 1076
naming contexts, 21
naming conventions, 1076
naming environments, 21
naming subcontexts, 22, 1164, 1213
overview, 8, 21–22, 1075–1076
subcontexts, 1076
tutorial, 22

JNDI Tutorial, 22

join function, 561–562

JPanel class, 190

JPDA (Java Platform Debugger Architecture), 29. *See also* debugging.

JScrollPane class, 192

jsf_core tags, 678–680

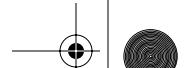
JSP (JavaServer Pages). *See also* servlets.
 actions, definition, 1381
 containers, 10, 1382
 custom actions, definition, 1382
 custom tags. *See also* JSP, tag handlers.
 bodies, 572
 communication between, 573
 defining variables, 572–573
 definition, 564, 1382
 encapsulating reusable content. *See*
 JSP, tag files.
 examples, 564–568
 jsp:body element, 572
 simple tags, 568
 tags with no body, 569
 TLD (tag library descriptor), 589–598
 custom tags, attributes
 defining in XML element body,
 571–572
 dynamic, 570–571, 588–589

fragment, 569–570, 584–588
jsp:attribute element, 571–572
simple, 569, 585–586, 586–588
database access, 21
declarations, definition, 1382
definition, 1380
developer roles, 15
directives, definition, 1382
documents. *See also* JSP pages; XML
 documents.
 definition, 1382
 example, 516–521
 identifying to the container, 535
 overview, 515–516
documents, in XML syntax
 CDATA sections, 528
 declarations, 530
 declaring tag libraries, 523–525
 DTD (document type definition),
 531–532, 533–535
 dynamic content, 527–530
 expressions, 530
 including directives, 525–527
 root element, 530–531
 scripting elements, 520–530
 scriptlets, 530
 standard syntax vs. XML, 521–523
 static content, 527–530
 well formedness, 521, 528
 XML declaration, 531–533
elements, 1382
expression language, definition, 1382
expressions, definition, 1382
fragments, 569–570

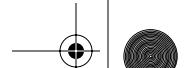
JDBC, 21

JSTL, 24

modules, 13
overview, 3, 6, 18
packaging, 13
scripting elements, 1383
scriptlets, 1383
standard actions, 1383
tag files. *See also* JSP, custom tags.
 custom tags, 563

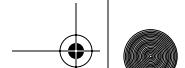
**INDEX****1457**

- declaring, 591–593
- definition, 1383
- fragments, 584–585
- location, 576
- overview, 573–576
- packaged, 593
- unpackaged, 591–593
- tag files, directive attributes
 - attribute**, 579, 580
 - body-content**, 579
 - list of, 577–578
 - tag attributes, declaring, 579
- tag files, directives
 - tag variables, declaring, 579, 586–588
 - tags, declaring, 576
 - uses for, 576
 - variable**, 580–581
 - variable synchronization, 580–584
- tag handlers. *See also* JSP, custom tags.
 - classic, 563
 - custom tags, 563
 - declaring, 594–595
 - declaring attributes for, 595–596
 - declaring variables for, 596–598
 - definition, 1383
 - invoking, 599
 - simple, 563
- tag handlers, programming
 - attribute validation, 600–602
 - for basic tags, 599
 - cooperating tags, 606–608
 - dynamic attributes, 601–602
 - examples, 608–616
 - iteration tags, 608–610
 - overview, 598
 - scope of objects, 605
- TagExtraInfo** class, 604–606
- for tags that define variables, 603–606
- for tags with attributes, 600–602
- for tags with bodies, 602–603
- template tag library, 610–613
- in Web applications, 599
- tag libraries. *See also* JSTL.
 - custom tags, 563
- declaring, JSP documents, 523–525
- declaring, JSP pages, 503–505
- definition, 502–503, 1383
- including, 505–506
- tags, scripting
 - with bodies, 626–627
 - body content, 623
 - classic tags, 623
 - cooperating, 627–629
 - defining variables, 629–630
 - doAfterBody** method, 627
 - doInitBody** method, 626
 - object sharing, 627–629
 - release** method, 627
 - TDL elements, 623
- tags, standard set, 24
- user interface. *See* JavaServer Faces.
- in XML syntax. *See* JSP, documents.
- JSP declarations, 620
- JSP documents, 515
 - alternative syntax for EL operators, 529
 - creating dynamic content, 528
 - creating static content, 527
 - preserving whitespace, 527
 - declaring namespaces, 524
 - declaring tag libraries, 523, 525
 - generating a DTD, 533, 535
 - generating tags, 529
 - generating XML declarations, 532–533
 - identifying to the Web container, 535
 - including directives, 525
 - including JSP pages in standard syntax, 527
 - scoping namespaces, 525
 - scripting elements, 529
 - validating, 531
- JSP expression language, 489
 - deactivating expression evaluation, 490
 - expression examples, 494
 - expression syntax, 489
 - functions, 496
 - defining, 496–497
 - using, 496
 - implicit objects, 492–493



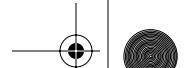
JSP expression language (*Continued*)
literals, 493
operators, 493
reserved words, 494
type conversion during expression evaluation, 491
JSP expressions, 622
JSP fragments, 569
JSP pages, 471. *See also* JSP documents.
adding security to, 1097
applets, including, 508–510
application-specific objects, 488
buffering, 485
compilation, 483–484
compilation errors, 484
compilation into servlets, 483
compiling, 865
controlling translation and execution, 483
converting to JSP documents, 522–523
creating and using objects, 488
creating dynamic content, 487
creating static content, 486
deactivating EL expression, 511
declarations. *See* JSP declarations.
default mode for EL expression evaluation, 511
defining preludes and codas, 512
definition, 1382
disabling scripting, 620
Duke's Bank, 1318
dynamic content, 487–489
error handling, 485–486
error pages
forwarding to, 485
precedence over Web application error page, 486
specifying, 485
examples, 84, 472–482, 537–538, 564, 863
execution, 484
expression language
arithmetic operators, 494
conditional operators, 494
deactivation, 490, 511–512

examples, 494–495
functions, 496–497
implicit objects, 492–493
literals, 493
logical operators, 494
null values, determining, 494
operators, 493–494
overview, 489–490
relational operators, 494
reserved words, 494
using expressions, 490–491
variables, 491–492
expressions. *See* JSP expressions.
finalizing, 621
form-based authentication example, 1105–1114
forwarding to other Web components, 507
implicit includes, 512–513
implicit objects, 488
importing classes and packages, 619
importing tag libraries, 503
including applets or JavaBeans components, 508
including JSP documents, 527
initial response encoding, 826
initializing, 620
JavaBeans components
creating, 499
custom tags, 502–506
design conventions, 497–498
properties, getting, 502
properties, setting, 500–502
retrieving properties, 502
setting properties, 500–501
tag libraries, declaring, 503–505
tag libraries, definition, 502–503
tag libraries, including, 505–506
using, 499
JavaServer Faces. *See* JavaServer Faces, JSP pages.
life cycle, 482–486
page directives, 484, 486
objects, 488–489
overview, 471–472

**INDEX****1459**

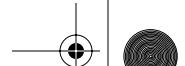
page encoding, 487, 512, 825
preludes and codas, 507
properties
 getting, 502
 setting, groups of pages, 510–513
 setting, individual pages, 500–502
response encoding, 487
reusing content, 506–507
reusing other Web resources, 506
scripting, 620–621
scripting elements. *See* JSP scripting elements.
scriptlets. *See* JSP scriptlets.
setting buffer size, 485
setting page encoding, 487
setting page encoding for group of, 512
setting properties for groups of, 510
setting response encoding, 487
setting the request encoding, 825
shared objects, 488–489
specifying scripting language, 619
standard syntax, 472
static content, 486–487
transferring control, 507–508
transitioning to JSP documents, 515
translation, 483–484
 enforcing constraints for custom tag
 attributes, 600
translation errors, 484
translation of page components, 483
URLs for running, 869
user interface. *See* JavaServer Faces.
using custom tags, 503
XML syntax, 472
JSP property groups, 511
JSP scripting elements, 617
 creating and using objects in, 617
 example, 618
JSP scriptlets, 621
`jsp:attribute` element, 571–572
`jsp:body` element, 572
`JspContext` interface, 598, 624
`jsp:declaration` element, 530
`jspDestroy` method, 621
`jsp:directive.include` element, 526

`jsp:directive.page` element, 525
`jsp:doBody` element, 584
`jsp:element` element, 529
`jsp:expression` element, 530
`jsp:fallback` element, 509
`jsp:forward` element, 507
`jsp:getProperty` element, 502
`jsp:include` element, 507
`jspInit` method, 620
`jsp:invoke` element, 584
`JSplitPane` class, 190, 193
`jsp:output` element, 531–532
`jsp:param` element, 508–509
`jsp:plugin` element, 508
`jsp:root` element, 530–531
`jsp:scriptlet` element, 530
`jsp:setProperty` element, 500
`jsp:text` element, 527–528
JSSE (Java Secure Socket Extension), 1379
JSTL (JavaServer Pages Standard Tag Library), 24, 537. *See also* JSP tag libraries.
core library, 541–549
core tags, 543
 `catch` tag, 549
 `choose` tag, 546
 conditional, 545
 flow control, 545
 `forEach` tag, 547
 `if` tag, 545
 `import` tag, 548
 `otherwise` tag, 546
 `out` tag, 549
 `param` tag, 548
 `redirect` tag, 549
 `remove` tag, 544
 `set` tag, 543
 `url` tag, 548
 variable support, 543
 `when` tag, 546
definition, 1380
example, 538–541
functions, 561
 `length` function, 561
functions library, 541–542, 561–562

**JSTL (*Continued*)**

internationalization library, 541–542, 554–556
internationalization tags, 554
 bundle tag, 555
 formatDate tag, 556
 formatNumber tag, 556
 localization context, 554
 message tag, 555
 outputting localized strings, 555
 param tag, 555
 parseDate tag, 556
 parseNumber tag, 556
 parsing and formatting, 556
 requestEncoding tag, 555
 setBundle tag, 555
 setLocale tag, 555
 overview, 24, 537, 541–542
SQL library, 541–542, 556–560
SQL tags, 556
 query tag, 557
 setDataSource tag, 556
 update tag, 557
XML library, 541–542, 550–554
XML tags, 550
 core, 551
 flow control, 552
 forEach tag, 552
 out tag, 551
 param tag, 554
 parse tag, 551
 set tag, 551
 transform tag, 553
 transformation, 553
JSTL tags. *See also* JSP, custom tags; scripting, tags; XML tags.
 bundle, 554–555
 catch, 544, 549
 choose, 544, 546, 550
 collaboration, 542–543
 core XML, 551–552
 date, 556
 dateParam, 557–558
 error handling, 549

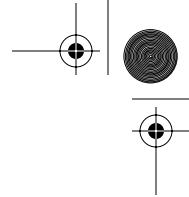
escapeXML function, 561–562
explicit collaboration, 542–543
expression evaluation, 549
flow control, 545–547, 552–553
 forEach, 544, 547, 550, 552–553
 formatDate, 554, 556
 formatNumber, 554, 556
 formatting, 556
 forTokens, 544, 547
functions library, 561–562
if, 544, 545, 550
implicit collaboration, 542–543
import tag, 544, 548
indexOf function, 561–562
internationalization library, 554–556
iterators, 557
join function, 561–562
message tag, 554–555
messaging, 555
number formats, 556
otherwise, 544, 546, 550
out, 544, 550, 551–552
parse, 550, 551–552
 parseDate, 554, 556
 parseNumber, 554, 556
query tag, 557–558
redirect tag, 544, 548
remove, 544
replace function, 561–562
requestEncoding, 554
Result interface, 559–560
set, 543–544, 550, 551–552
setBundle, 554–555
setDataSource, 556–558
setLocale, 554–555
setTimeZone, 554
setting the locale, 555
split function, 561–562
SQL library, 556–560
substring function, 561–562
substringAfter function, 561–562
substringBefore function, 561–562
time, 556
timeZone, 554, 556

**INDEX****1461**

- toLowerCase function, 561–562
- toUpperCase function, 561–562
- transaction**, 557–558
- transform tag, 550, 553–554
- transformation, 553–554
- transformation tag, 554
- trim function, 561–562
- update tag, 557–558
- URL, 548–549
- url, 544
- url tag, 544, 548
- variable support, 543–544
- when, 544, 546
- XML library, 550–554
- JTA** (Java Transaction API), 18. *See also* transactions, JTA.
 - definition, 1379
 - overview, 18
 - transactions, 1063–1064, 1069
- JTree**, displaying content, 223
- JTree**, displaying DOM
 - AdapterNode class, 195–200
 - adapting TreeModel to JTree, 195–204
 - adding import statements, 189–190
 - attribute data, 222
 - CDATA, 222
 - child access, 217
 - comments, 222
 - complex tree, 207–211
 - compressing the tree view, 213
 - converting DomEcho to a GUI, 189
 - creating adapters, 195
 - data types, 221–223
 - display components, 192–194
 - displaying the tree, 223
 - document fragments, 222
 - documents, 222
 - element content, defining, 220–223
 - element data, 221
 - entity data, 222
 - entity reference data, 222
 - GUI framework, 190–191
 - lexical controls, 212
 - modifications, 228
- notations, 222
- processing instructions, 222
- running the application, 225–227
- simple tree, 205–207
- text data, 222
- TreeModel adapter, 200–204
- wiring the JTree to the JEditorPane, 223–224
- JTree**, nodes
 - changing, 236
 - child access, 217
 - DocType, 222
 - getting content of, 235–236
 - inserting, 237
 - making selectable, 213–215
 - removing, 236
 - searching for, 234–235
 - subnodes, concatenating, 220–223
 - traversing, 234
 - types, identifying, 219–220
 - visibility, 216
- JTree** class, 189
- JTree** class JEditorPane class, 223
- JTreeModel** class, 189
- JTS** (Java Transaction Service), 1379
- JTS** API, 1063

K

- Key pairs, 1116
- Keystores**, 1116
 - client certificates, creating, 1120–1121
 - commands, 1121
 - contents, checking, 1121
 - definition, 1116, 1383
 - mutual authentication example, 1135
 - server certificates, creating, 1116–1117
- keytool**, 1116–1121
- Knowledge representation XML standards, 1351–1352
- Knowledge standards
 - RDF, 1351
 - RDF schema, 1352
 - XTM, 1352

**L**

Labels, in foreign languages. *See* internationalization; localization.

`lang` function, 256

`last` function, 254

LDAP services, 22

“, left double quote entity, 61

`le`, JSP operator, 494

Left double quote entity, “, 61

Legacy information systems. *See* EIS tier.

Less than, equal (<=)

- JSP operator, 494
- XPath operator, 253

Less than, exclamation point (<!...>), in DTDs, 53

Less than, question mark (<?...?>), in XML markup, 34–35

Less than (<)

- entity for, 49
- JSP operator, 494
- SAX processing, 127
- XPath operator, 253

Less than entity, <, 49

Less than...greater than (<...>), in XML markup, 31

Lexical controls, 212

Lexical events. *See also* CDATA sections.

- comment method, 164
- echoing comments, 164, 167–168
- echoing lexical information, 168–171
- identifying CDATA sections, 164

`LexicalHandler`, 164–171

SAX

- comment method, 164
- echoing comments, 164, 167–168
- echoing lexical information, 168–171
- identifying CDATA sections, 164

`LexicalHandler`, 164–171

Lexical information, echoing, 168–171

`LexicalHandler`, 164–171

Libraries

- DOM (Document Object Model), 106
- JAXP (Java API for XML Processing), 106, 113

SAX (Simple API for XML), 106

XSLT (Extensible Stylesheet Language Transformations), 106

Life cycle

entity beans, 848–850

J2EE component, 1383–1384

JavaServer Faces, 1384

JavaServer Faces applications, 813–814

JavaServer Faces pages, 662–669

- apply request values phase, 653–666, 667, 669, 745, 768, 783
- Faces request, 663
- faces request, 663–664
- Faces response, 663
- faces response, 663–664
- invoke application phase, 653, 668, 768
- non-Faces request, 663
- non-faces request, 663–664
- non-Faces response, 663
- non-faces response, 663–664
- overview, 662
- process validations phase, 653, 666–667, 669
- render response phase, 666–667, 668–669, 668–669, 746, 752, 772, 780, 785, 788
- `renderResponse` method, 663, 666–667
- request processing, 663–665
- request values phase, 666
- `responseComplete` method, 663, 666–668
- restore view phase, 665–666, 669, 785, 788
- standard request processing lifecycle, 664
- update model values phase, 658–668, 667–669
- `updateModels` method, 667
- view phase, 665–666
- views, 662, 665–666

JSP pages, 482–486

message-driven beans, 850–851

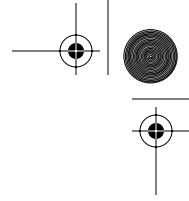
servlets, 441–444



- session beans, 848–850
stateful session beans, 847–848
stateless session beans, 848
Web applications, 84–86
Life-cycle management contract, 1359–1360
LIKE expressions, 1036
Line breaks, XML to HTML, 280
<LINK> element, 280–281
Linkability, XML, 38
Linking, XML standards, 1350–1351
List boxes, 697–698, 703–704
<LIST> element, 281, 293
List properties, initializing, 799
Listener class, 442–443
Listener classes, 441
defining, 442
examples, 442
listener element, 591
Listener interfaces, 442
Listeners, registering on components, 710–712
list-entries element, 795
Lists, initializing, 801–802
Lists and list items, XML to HTML, 293
Literals, EJB QL, 1032–1033
Literals, JSP pages, 493
Local access vs. remote, 842–843
Local clients, 841–842
Local home interface, 946–947
Local home interfaces, 946
defined, 842
Local interfaces, 842, 947
defined, 842
examples, 946–947, 950
requirements, 917
Local JMS transactions, 1204–1211
Local names, 351–352
Local subsets, 1384
Local transactions, JMS, 1204
Localization. *See also* internationalization.
component properties, 741–744
context, internationalization, 554
dynamic data, 741–742
locale, establishing, 821
messages, JSP pages, 703–705, 742–744
Web applications
character encoding, 824–825
character sets, 824
date formats, 823
Java localization classes, 819–820
labels, 820–823
locale, establishing, 821
messages, 820–823
number formats, 823
page encoding, 826
request encoding, 825–826
resource bundle, setting, 822
response encoding, 826–827
retrieving localized messages, 822–823
UTF-8 encoding, 825
local-name function, 257
Locator, 136
Locator object, 142
Log viewer, 29
Logical operators, 494
Login authentication, 1100–1105. *See also* authentication.
Login form, creating, 1107–1108
LongRangeValidator, 714
lookup method, 1075–1076, 1081
<t, JSP operator, 494
&<t, less than entity, 49

M

- Mail session connections, 1080–1083
Mail sessions, 1080
connecting to from J2EE components, 1081
creating, 1082
Mainframe transaction processing. *See* EIS tier.
Managed bean creation facility, 659, 769, 793–802, 1384
initializing properties with managed-property elements, 795–802
managed bean declarations. *See* managed bean declarations.

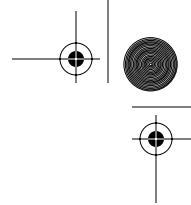


Managed bean declarations, 643–644, 769
key-class element, 798
list-entries element, 795
managed-bean element, 793, 800
managed-bean-name element, 644, 794
managed-bean-scope element, 794
managed-property element, 644, 795–802
map-entries element, 795, 797
map-entry element, 797
message-bean-name element, 715
null-value elements, 795
property-name element, 644, 715
value element, 795
values element, 799
Managed bean properties, initializing, 799–801
managed-bean element, 793–795
managed-bean-class element, 794
managed-bean-scope element, 794
managed-property element, 795–796
Management contracts, 1359–1360
Mandatory attribute, 1048
Many-to-many relationships, 837, 930–933
Many-to-one relationships, 837
Map properties, initializing, 797–798
map-entries element, 795, 797–798
MapMessage interface, 1171
Mapping
 errors to error screens, 99
 JavaServer Faces classes to tags, 647–651
 resource references to data sources, 104
 roles, 1390
 servlets, 1393
 table relationship example
 child table, entity bean, 927–929
 child table, helper class, 923–926
 foreign keys, 919–922
 many-to-many, 930–933
 one-to-many, 922–930
 one-to-one, 919–922
 URLs to Web components, 96–97
Maps, initializing, 801–802
Markup, XML, 31

Mathematical Markup Language (MathML), 1353
MathML (Mathematical Markup Language), 1353
Menus, 697–698, 699–700, 703–704
Message acknowledgment, JMS
 bean-managed transactions, 1219
 introduction, 1193
 message-driven beans, 1214
Message bodies, JMS, 1171
Message consumers, 1167–1168, 1384
Message consumption, 1161
Message consumption, JMS
 asynchronous, 1161, 1183
 introduction, 1161
 synchronous, 1161, 1174
Message factories, 743
Message headers, JMS, 1170
Message IDs, JMSMessageID message header field, 1170
Message interface, 1171
Message listeners, JMS, 838, 1168–1169
 examples, 1184, 1233, 1248
 introduction, 1168
Message producers, 1166–1167, 1385
Message producers, JMS, 1166
Message properties, JMS, 1171
Message selectors, 1168–1169
Message selectors, JMS
 introduction, 1169
 specifying for message-driven beans, 1228
message tag, 554–555, 640
Message transport protocols, 10–12
MessageConsumer interface, 1167
Message-driven bean class, 1005–1007
Message-driven beans, 7, 17, 838
 See also backing beans
 See also enterprise beans
 See also entity beans
 See also session beans
 accessing, 838
 coding, 1005, 1224, 1234, 1248
 consuming messages, 1239–1245

INDEX**1465**

- defined, 838
- definition, 1384
- deploying, 1245–1254
- deployment descriptor elements, 1220
- description, 838–840
- examples, 1003, 1222, 1231, 1239, 1246
- garbage collection, 851
- introduction, 1214
- life cycle, 850–851
- messages from entity beans, 1231–1239
- messages from session beans, 1222–1230
- `onMessage` method, 839, 1005
- overview, 7, 17
- requirements, 1005
- sending messages to. *See JMS.*
- transaction types allowed, 1069
- transactions, 1046, 1049, 1057–1058, 1069
- uses for, 840
- vs. entity beans, 838–840
- vs. session beans, 838–840
- Message-driven beans example**
 - administered objects, 1007–1009
 - application client, 1004–1005
 - bean characteristics, setting, 1010–1011
 - bean type, specifying, 1010
 - components that send messages, 1011–1014
 - deploying, 1007–1014
- deploytool**
 - for components that send messages, 1011–1014
 - JNDI names, specifying, 1013–1014
 - for message-driven beans, 1010–1011
 - resource references, setting, 1012
- JNDI names, specifying, 1013–1014
- message-driven bean class, 1005–1007
- overview, 1004
- parsing messages, 1005–1006
- performing business logic, 1005–1006
- resource references, setting, 1012
- running, 1007–1009
- MessageDrivenContext interface**, 1215
- MessageFactory class**, 347
- MessageListener interface**, 1168
- MessageProducer interface**, 1166
- Messages**. *See also JMS; SAAJ.*
 - acknowledgment, 1193–1197
 - asynchronous processing, 838–840
 - bodies, 1171–1172
 - consuming, 1239–1245
 - creating messages with the **MessageFactory** class, 743
 - definition, 1158, 1384
 - entity beans, 1231–1239
 - expiration, 1198–1199
 - FacesMessage** class, 742
 - in foreign languages. *See internationalization; localization.*
 - `getMessage(FacesContext, String, Object)`, 753
 - `getMessage(FacesContext, String, Object)` method, 743
 - headers, 1170
 - integrity, 1102, 1133
 - localization, 820–823
 - localizing messages, 742–744
 - message factory pattern, 742
 - to message-driven beans. *See JMS.*
 - MessageFactory** class, 743, 752–753
 - MessageFormat** pattern, 679, 693
 - outputFormat** tag, 693
 - overview, 1169–1170
 - param** tag, 693
 - parameter substitution tags. *See JavaServer Faces core tag library; param tag.*
 - parsing, 1005–1006
 - performing business logic, 1005–1006
 - persistence, 1197
 - priority levels, 1198
 - producing, 1212–1213
 - properties, 1171
 - queuing messages, 758, 802
 - registering, 802–803
 - session beans, 1222–1230
 - synchronous receiving, 1212–1213
 - using the **FacesMessage** class to create a message, 743



Messages, JMS

- body formats, 1171
- definition, 1158
- delivery modes, 1197
- expiration, 1198
- headers, 1170
- introduction, 1169
- persistence, 1197
- priority levels, 1198
- properties, 1171

Messages, SAAJ

- accessing elements, 347
- adding body content, 348
- attachments, 342
- creating, 347
- getting the content, 354
- overview, 340

Messaging

See also JMS

See also SAAJ

See also SOAP

contracts, 1361

definition, 1154

domains, 1159–1161

standard, 18

Messaging domains, JMS, 1159

- common interfaces, 1160
- point-to-point, 1159
- publish/subscribe, 1160

Messaging tags, 555

Method binding, 691

- MethodBinding class, 775, 784
- method-binding expressions, 641, 653, 657, 691, 720–721, 749, 808

Method permissions, 1143, 1385

specifying, 1143

Method-binding backing beans, 657

Method-binding expressions, 775, 1385

MethodBinding class, 775

Methods

comment, 164

create, 1370

ignorableWhitespace, 151–152

long-running, shutting down, 470

prohibited in transactions, 1057, 1068

remove, 1389

setCoalescing, 212

setExpandingEntityReferences, 212

setIgnoringComments, 212

setIgnoringElement, 212

startCDATA, 165

startDTD, 165

startEntity, 165

MIME

data, 64

headers, 344

MIME data types, 64–65

Minus sign (-)

JSP operator, 494

XPath operator, 253

Mixed-content DTD model, 54

Mixed-content models, 1385

mod, JSP operator, 494

mod, XPath operator, 253

Mode-based templates, 301

Modes

content, 177

Text, 206

Modularizing DTDs, 78

Modules, 13–14

Multimedia data file entities, 64–65

Multiplicity, in relationships, 837

Multitiered applications, 2–8

Mutual authentication, 1123

certificates, creating, 1116–1118, 1120–1121

definition, 1385

enabling, 1123–1124

example, 1133, 1135–1142

overview, 1103–1105

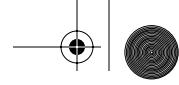
SSL support, 1123–1124

verifying, 1124

MVC architecture, 477

MyAppClient.java class, 426–427

MyUddiPing.java, 373–380

**INDEX****1467****N**

NAICS (North American Industry Classification System), 400, 1386
using to find organizations, 401, 421
name function, 257
Name interface, 348
Names
fully qualified, 349, 352
local, 351–352
Namespace functions, 257
Namespace prefixes, 73–74
Namespaces, 349, 1347. *See also JAXP.*
and attributes, 71
collisions, avoiding, 1076
defining, 72
defining a prefix, 73
defining in DTD, 72
defining prefixes, 73–74
definition, 1385
functions, 257
node, 248
overview, 19
prefix, 350
purpose of, 71
referencing, 72–73
specification, 71
target, 242
using, 71
validating with multiple, 239
XML standard, 1347
namespace-uri function, 257
namespace-uri function, 257
Name-to-object bindings, 1076
Naming and directory functionality, 21–22
Naming conflicts, 70–71
Naming context
definition, 1385
JNDI, 1076
location of, 22
overview, 21–22
Naming conventions, 846–847, 1076
Naming environment, 21–22, 1385
NamingContainer interface, 646
Navigation

backing bean methods, 755–757
backing bean methods, referencing, 720–721
EJB QL (Enterprise JavaBeans Query Language), 1016
JavaServer Faces model, 654–656
JavaServer Faces pages, 640–641
path expressions, 1032
rules, configuring, 805–808
Navigation model, 640, 654–656
action attribute, 639, 657, 668, 685, 719–720, 768, 775
action method, 805
action methods, 655, 755, 805, 807
ActionEvent class, 721
example navigation rules, 806
logical outcome, 685, 720–721, 755–756, 805, 807
navigation case, 655
navigation rules, 640, 655, 685, 721, 805–806
NavigationHandler class, 655–656, 668, 685, 756
referencing methods that perform navigation, 720, 755
writing a backing bean method to perform navigation processing, 755
NDS services, 22
ne, JSP operator, 494
Nested elements, 54
Nesting
DTD elements, 54
tags, 33, 46
.NET interoperability, 19
Network security requirements, 1093, 1096–1097
Network services, 12. *See also WSDL.*
Never attribute, 1049
NIS services, 22
node function, XPath wildcard, 252
Nodes, 177
attribute, 222, 248
Attribute, 207
CDATA, 211

Nodes (*Continued*)

- changing, 236
 - comment, 222, 248
 - Comment**, 206
 - constants, 219
 - content, 235
 - controlling visibility, 216
 - DocType**, 208, 222
 - document, 222
 - document fragment, 222
 - element, 230, 248
 - entity, 222
 - entity reference, 211
 - inserting, 237
 - namespace, 248
 - navigating to, 180
 - notation, 222
 - processing instruction, 209, 222, 248
 - removing, 236
 - root, 230, 248
 - SAAJ and, 341
 - searching, 234
 - text, 230, 233, 248
 - traversing, 234
 - types, 196, 248
 - value, 177
- Nodes, DOM
- changing, 236
 - DocType**, 222
 - element nodes, creating, 230–231
 - getting content of, 235–236
 - inserting, 237
 - making selectable, 213–215
 - removing, 236
 - searching for, 234–235
 - subnodes, concatenating, 220–223
 - text, 175
 - traversing, 234
 - types, identifying, 219–220
 - types of, 175, 177–181
 - visibility, 216
- Node-set functions, 254
- Nonconfigurable services, 9. *See also* containers.

- Non-faces request, 663–664
- Non-faces response, 663–664
- Nonfatal errors, 145–146
- Non-Java-based platforms, 19–20. *See also* JAX-RPC.
- NON_PERSISTENT** delivery mode, 1197
- Nonvalidating parser, 139
- Nonvalidating parsers, SAX

 - DTD's effect on, 149–151
 - error handling, 139–147

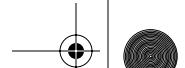
- Non-XSL tags, 284
- Normalization, 77–78, 1386
- normalize-space** function, 255
- Normalizing

 - data, 77
 - DTDs, 78

- Normalizing DOM, 231–233
- North American Industry Classification System (NAICS), 1386
- not**, JSP operator, 494
- not** clause, 300
- not** function, 256
- NOTATION** keyword, 64
- Notation nodes, 222
- notationDecl** method, 172
- Notations, 222, 1386
- <NOTE> element, 281, 291–292, 294–295
- NotSupported** attribute, 1048
- NULL comparison expressions, 1036
- NULL values, 1038–1039
- Null values, determining, 494
- Number format tags, 556
- number** function, 256
- NumberConverter**, 709–710
- NumberConverter** converter, 709–710
- Numbers

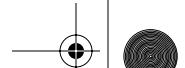
 - conversion, 709–710
 - formatting, 301
 - generating, 301
 - localization formats, 823

- Numeric functions, 256

**INDEX****1469****O**

OASIS (Organization for the Advancement of Structured Information Standards), 74, 1386
OBJECT keyword, 1042
Object Management Group (OMG), 1386
Object request broker (ORB), 1386
Object Transaction Service (OTS), 1386
ObjectMessage interface, 1171
Objects
 binding to data, 686–689
 getting, 944
 JSP pages, 488–489
 Locator, 142
 Parser, 121
 references, passing, 891–892
 scripting, 617
 sharing in scripts, 627–629
Objects, administered (JMS), 1163
OMG (Object Management Group), 1386
One-to-many relationships
 bean-managed persistence, 922–930
 container-managed persistence, 987
 container-managed relationships, 837
 example, 987
 primary keys, 987
One-to-one relationships
 bean-managed persistence, 919–922
 container-managed persistence, 986
 container-managed relationships, 837
 example, 986
One-way messaging, 1386
Online banking example
 account information
 changing, 1305–1306
 creating, 1317
 customer access, 1318–1319
 getting, 1304–1305
 account-customer relationship management, 1304
 adding groups and users to the default realm, 1329
 application, packaging and deploying, 1334–1335

application client, 1310, 1312–1317
 class methods, 1313
 classes, 1311
 classes and their relationships, 1311–1312
 compiling, 1330
 methods, 1316
 overview, 1310–1311
 packaging, 1332
 running, 1338
 authentication, 1326
 building and deploying, 1328
 compiling, 1330
 component interaction, 1301
 creating the data source, 1329
 custom tags, 1320
 customer information, creating, 1317
 database
 creating, 1329
 reading data from, 1315–1317
 servers, setting up, 1328–1329
 tables, 1308–1309
 validating updates, 1315–1317
 database tables, 1308
 deploying, 1334–1335
 enterprise beans, 1309
 compiling, 1330
 helper classes, 1307
 method permissions, 1309
 packaging, 1330–1332
 protecting, 1309
 session beans, 1303–1306
 tables representing business entities, 1308
 tables that hold the next primary key, 1309
entity beans, 1303–1304, 1306
groups, adding, 1329
helper classes, 1307
internationalization, 1327–1328
internationalizing clients, 1327
JavaBeans components, 1319
JDBC data source, 1329
JNDI names, 1335, 1338

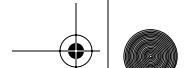


Online banking example (*Continued*)
 JNDI names, reviewing, 1335–1338
 JSP pages, 1318
 overview, 1301
 packaging, 1334–1335
 packaging and deploying, 1330
 populating the database, 1329
 presentation, 1319–1320
 security roles, 1309
 servlet, 1323
 session beans, 1303, 1306
 user interface
 creating, 1313
 getting data from, 1315–1317
 updating, 1313
 users, adding, 1329
 Web client, 1318, 1328
 client components, 1320–1323
 compiling, 1330
 component interaction, 1325
 design strategies, 1319–1320
 overview, 1318–1319
 packaging, 1333–1334
 packaging and deploying, 1333–1334
 protecting resources, 1325–1326
 request processing, 1323–1325
 running, 1339
 Web resources, protecting, 1326
onMessage method
 introduction, 1168
 message-driven beans, 839, 1005, 1214
Operator precedence
 EJB QL, 1033
 XPath, 252
Operators
 JSP pages, 493–494
 XPath, 252–253
or
 JSP operator, 494
 XPath operator, 253
ORB (object request broker), 1386
ORDER BY clause, 1027–1030
OrderApp. *See* CMP examples, inventory and ordering.

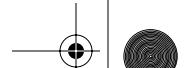
Organization for the Advancement of Structured Information Standards (OASIS), 74, 1386
Organization interface, 405
Organizations
 creating with JAXR, 404
 finding
 by classification, 401, 421
 by name, 400, 421
 using WSDL documents, 424
 keys, 405, 411
 primary contacts, 405
 publishing with JAXR, 408, 420, 422, 424
 removing with JAXR, 411, 421
Organizations, JAXR
 creating, 404–406
 finding by classification, 401–403
 finding by name, 400–401
 publishing, 408
 service bindings, 407
 services, adding, 407
OS principal, 1386
otherwise tag, 544, 546, 550
OTS (Object Transaction Service), 1386
out tag, 544, 550, 551–552
Outbound contracts, 1360–1361
outputFormat tag, 693–694
outputLabel tag, 692
outputLink tag, 692–693
outputText tag, 691–692

P

package-appclient tool, 26
Packaged tag files, 591–593
Packaging
 application clients, 861–862
 applications, 12–14
 asynchronous message consumption, 1185–1186
 bean-managed transactions, 1061
 CMP example, 961–964
 Coffee Break server, 1295–1296
 container-managed transactions, 1053–1055

**INDEX****1471**

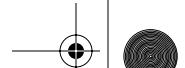
- enterprise application, 960, 970–971
- enterprise beans, 857–858, 881
- form-based authentication example, 1110
- inventory and ordering example, 993–999
- J2EE application clients, 432
- JavaServer Faces technology, 1297–1298
- JAX-RPC, 318–320, 1292–1294
- JAX-RPC service, 1292–1294
- JDBC transactions, 1059
- JSP (JavaServer Pages), 13
- JTA transactions, 1065–1066
- message-driven beans, 1227–1228
- online banking example, 1330–1335
- overview, 12–14
- SAAJ service, 1294–1295
- session beans, 431, 937, 1226–1227
- shopping cart example, 881–882
- synchronous message receives, 1181
- timer service example, 897–898
- Web clients, 865, 1333–1334
- Web modules, 88–89
- Web services, 318–320, 887–888
- Page authors, 634–635
- page directive, 619
- Page encoding, 487, 512, 826
- Page navigation. *See* navigation model.
- PageContext interface, 624
- pageContext object, 492
- Pages. *See* JSP.
- pageScope object, 493
- PAM (Pluggable Authentication Module)
 - framework. *See* JAAS.
- <PARA> element, 281, 292–293
- Paragraphs, transforming XML to HTML, 292
- param object, 492
- param tag
 - import tag, 544, 548
 - message tag, 554–555
 - query tag, 557–558
 - redirect tag, 544
 - transform tag, 550
 - transformation tag, 554
 - update tag, 557–558
- url tag, 544, 548
- Parameter entities, 66–68, 155, 1386
- Parameter entity, 66
- Parameterized DTDs, parsing in SAX, 162–163
- paramValues object, 492
- parse method, 271
- parse tag, 550, 551–552
- Parsed
 - character data, 54
 - entity, 63, 155
- Parsed character data (PCDATA), 54
- Parsed entities, 63, 155, 1387
- parseDate tag, 554, 556
- parseNumber tag, 554, 556
- Parser
 - implementation, 155
 - modifying to generate SAX events, 269
 - nonvalidating, 139
 - using as a SAXSource, 275
 - validating, 155
 - error handling, 161
- Parser object, 121
- ParserConfigurationException, 144
- Parsers
 - definition, 1387
 - SAX
 - choosing, 155
 - nonvalidating, 139–147, 149–151
 - pull parser, 116
 - validating, 155–161
 - XSLT
 - creating, 267–269
 - generating SAX events, 269–275
 - modifying, 269–275
 - as a SAXSource, 275–277
- Parsing parameterized DTDs, 162–163
- Passivation, 847, 1387. *See also* activation.
- Passwords, 1127
- Passwords, protecting, 1097–1098, 1113–1114
- Path expressions
 - definition, 1016
 - examples, 1032



- Path expressions (*Continued*)
 expression types, 1031
 navigation, 1032
 syntax, full, 1030–1032
- Pattern, 247
- PCDATA (parsed character data), 54
- PCDATA *versus* CDATA, 54
- Percent sign (%)
 in entity names, 67
 JSP operator, 494
- Period (.)
 JSP operator, 491–492
 in XML markup, 43
- Persistence, 833–834, 1387. *See also* BMP; CMP
 bean-managed. *See* BMP.
 container-managed. *See* CMP.
 entity beans, 833
 JMS messages, 1197
 session beans, 831
 types, 834
- Persistent data
 and entity beans, 7
 overriding, 9, 17, 21
- PERSISTENT delivery mode, 1197
- Persistent fields, 835
 container-managed persistence, 835–836
 definition, 1016, 1387
 deploytool, 978
 EJB QL, 1016, 1030
 example, 943
 examples, 943
- Physical schemas, 835
- Pinging UDDI, 373–380
- Platform APIs, 16–17. *See also* APIs.
- Platform services
 See JMS
 See resource connections
 See security
 See transactions
- PlayerBean. *See* CMP examples.
- Pluggability layer, 105
- Pluggable Authentication Module (PAM) framework. *See* JAAS.
- Plus sign (+)
 DTD qualifier, 53
 JSP operator, 494
 XPath operator, 253
- POA (Portable Object Adapter), 1387
- PointBase database, 26, 101, 1078–1080.
 See also resource connections.
 starting, 28
 stopping, 28
- PointBase database server
 definition, 26
 overview, 28
 starting/stopping, 28
 startserver script, 28
 stopserver script, 28
 Windows commands, 28
- Point-to-point connection, SAAJ, 353
- Point-to-point messaging domain, 1159–1160
- Point-to-point messaging system, 1387
- Populating databases, 101–102
- Port numbers, 25
- Portable deployment descriptors, 12. *See also* deployment descriptors.
- Portable Object Adapter (POA), 1387
- position function, 254
- Positional functions, 254
- Positional functions, XPath, 254
- Postal addresses
 retrieving with JAXR, 416, 422
 specifying with JAXR, 414, 422
- Postal addresses, JAXR classifications, 422–423
- Prerequisites, xxxvii
- Presentation, 1319–1320, 1350–1351
- Presentation-oriented Web applications, 81
- Primary key class, 934–935, 982
- Primary keys, 987. *See also* ejbFindByPrimaryKey method.
 automatically generating, 983
 bean-managed persistence, 933
- CMP example, 980–984
 composite, 933, 980
 compound, 988–989

INDEX**1473**

- container-managed persistence, 980
- defined, 834
- definition, 1387
- in the entity bean class, 935–936
- entity beans, 834
- example, 987
- examples, 934, 982
- generating, 983–984
- getting, 936
- methods for setting, 850
- one-to-many relationships, 987
- primitive, 987–988
- primitive types, 987
- returned by `create` method, 905
- returning, 905–906
- unknown, 987
- Primitive primary keys, 987–988
- Primitives, JAX-RPC, 325
- Principal name, 1089
- Principals, 1098, 1387
- `PrintWriter` class, 451
- Priority levels, for messages, 1198
 - `JMSPriority` message header field, 1170
- Privileges, 1387
- Procedures, executing remotely. *See JAX-RPC; RPCs.*
- Process validations phase, 666–667
- Processing
 - command line argument, 119
 - data, 39
 - instruction nodes, 209, 222, 248
 - instructions, 35, 46, 137, 179
- Processing instructions
 - definition, 1387
 - displaying in a `JTree`, 222
 - SAX, 137–139
 - XML, 35–36, 46–47
- `processingInstruction`, 135, 138
- `processingInstruction` handler, 137–139
- Product provider role, 14
- Programmatic security
 - definition, 1087, 1387
- EJB tier, 1145
- Web tier, 1098–1100
- Programming model, JMS, 1162
- Programs
 - See application clients*
 - See applications*
 - See scripting*
 - See servlets*
- Prohibited methods in transactions, 1057, 1068
- Prologs, 34–35, 1388
- Propagating security identity, 1149–1151
- Properties
 - binding to component values, 715–716
 - initializing, 795–796
 - JAXR connections, 396–399
 - JSP pages
 - getting, 502
 - setting, groups of pages, 510–513
 - setting, individual pages, 500–502
 - list, initializing, 799
 - managed bean, initializing, 799–801
 - map, initializing, 797–798
- Protecting passwords, 1097–1098, 1113–1114
- Protecting Web resources, 1094
- Providers
 - JAXR, 391
 - JMS, 1158
- Proxies, 313, 321
 - HTTP, setting, 398
- Public identifiers, 109
- Public key certificates, 1102, 1133, 1388
- Public key cryptography, 1116
- PUBLIC keyword, 62–63
- Publishing
 - business information on the Internet, 12.
 - See also ebXML; UDDI.*
 - classification schemes, 421–422
 - organizations, JAXR, 408
 - organizations, WSDL documents, 424
 - WSDL document concepts, 423
- Publish/subscribe messaging domain, 1160
 - durable subscriptions, 1200
 - introduction, 1160



Publish/subscribe messaging system, 1388
PubQuery session bean, coding, 427
Pull parser, 116

Q

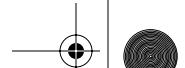
QName object, 327
 Query strings, 1388
 query tag, 557–558
 Querying entity beans. *See* EJB QL.
 Querying XML registries, 399–400
 Question mark (?), DTD qualifier, 53
 Queue interface, 1164
 Queues. *See also* point-to-point messaging system.
 creating, 1164, 1178
 introduction, 1164
 looking up, 1004, 1164
 temporary, 1199, 1233
 ", quote entity, 49
 Quote ("), entity for, 49

R

.rar file extension, 14
 RAR (Resource Adapter Archive) files, 1357, 1388
 RDF (Resource Description Framework)
 definition, 1388
 schema, 1352, 1388
 XML standard, 1351–1352
 &rdquo, right double quote entity, 61
 Reading XML files
 DOM (Document Object Model), 182–188, 258–259
 Xalan, 258–259
 XSLT, 258–259
 Realms, 1088–1089, 1388. *See also* security, policy domains.
 recover method, 1194
 Redelivery of messages, 1193–1194
 JMSRedelivered message header field, 1170
 redirect tag, 544, 548
 Reentrant entity beans, 1389

References. *See* entities, references.

Referencing
 DTDs, 56–57
 entities
 binary entities, 64–66
 with entity references, 66
 external entities, 62–63
 parameter entities, 66–68
 unparsed entities, 64–66
 namespaces, 72–73
 Referencing backing bean methods, 719–723
 for handling action events, 721, 757, 763, 775
 for handling value-change events, 657, 722
 for performing navigation, 720, 755, 775
 for performing validation, 722, 758
 Refreshing instance variables, 907–908
 Registered trademark entity, ®, 61
 Registering
 ActionListener, 711–712
 listeners on components, 710–712
 messages, 802–803
 ValueChangeListener, 711
 Registering custom converters, 804
 converter element, 804
 converter-class element, 804
 converter-id element, 804
 Registering custom renderers, 771, 786, 808
 renderer element, 809
 renderer-class element, 809
 renderer-type element, 809
 render-kit element, 809
 render-kit-id element, 809
 Registering custom UI components, 772, 810
 component element, 810
 component-class element, 810
 component-extension element, 810
 component-type element, 810
 property element, 810
 Registering custom validators, 803
 validator element, 803
 validator-class element, 803

**INDEX****1475**

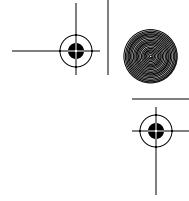
- validator-id element, 803
- Registering messages, 802
 - default-locale element, 803
 - locale-config element, 803
 - message-bundle element, 803
 - supported-locale element, 803
- Registries. *See also* XML registries.
 - accessing over the Web, 20. *See also* JAXR.
 - definition, 389, 1389
 - deleting from, 1263–1265
 - ebXML, 390–391
 - getting access to public UDDI registries, 394
 - Java WSDP Registry Server, 390, 1291
 - private, 390
 - publishing to, 1259–1263
 - querying with JAXR, 399
 - submitting data with JAXR, 404
 - UDDI, 390
 - UDDI registries, 390–391
 - using public and private, 418
- Registry objects, 392
 - retrieving with JAXR, 425
- Registry providers, 1389
- Registry technologies, 20
- RegistryObject interface, 392
- RegistryService interface, 392, 399
- RegistryService object, 399
- Relational operators, 494
- Relationship fields
 - CMP example, 943
 - defined, 836
 - definition, 1016, 1389
 - deploytool, 976
 - direction, 837
 - EJB QL, 1016, 1030
 - enterprise beans, 836
 - examples, 943
 - modifying by local clients, 953
- Relationships
 - bean-managed persistence, 834
 - container-managed. *See* container-managed relationships.
- multiplicities, 837
- Relationships, entity beans
 - configuring, 995–996
 - defining, 1002
 - many-to-many, 837, 930–933
 - many-to-one relationships, 837
 - one-to-many
 - BMP (bean-managed persistence), 922–930
 - CMP (container-managed persistence), 987
 - container-managed relationships, 837
 - example, 987
 - primary keys, 987
 - one-to-one
 - BMP (bean-managed persistence), 919–922
 - CMP (container-managed persistence), 986
 - container-managed relationships, 837
 - example, 986
 - self-referential, 985–986
 - unidirectional relationships, 837–838, 987
- RELAX NG, 1349
- release method, 627
- Reliability, JMS
 - advanced mechanisms, 1200
 - basic mechanisms, 1193
 - durable subscriptions, 1200
 - local transactions, 1204
 - message acknowledgment, 1193
 - message expiration, 1198
 - message persistence, 1197
 - message priority levels, 1198
 - temporary destinations, 1199
- Reliability mechanisms, JMS
 - advanced, 1200–1211
 - basic, 1193–1199
- Remote access *vs.* local, 842–843
- Remote clients, 840–841
- Remote connectivity model, 9. *See also* containers; JAX-RPC.



Remote interfaces
coding, 855
defined, 841
definition, 1389
description, 879–880
entity and session beans, 841
examples, 855, 879, 916
requirements, 880
Remote Method Invocation (RMI), 1390
and messaging, 1154
Remote procedure calls (RPCs), 19, 313. *See also* JAX-RPC.
remove, transactions, 1049
remove method, 1389
bean-managed persistence, 907
life cycles, 848, 850
remove tag, 544
Render kit, 647, 1389
Render response phase, 668–669
rendered attribute, 682
Renderer, component combinations, 764–765
Renderer class, 786–788
Renderer type, identifying, 788
Renderers, 763–764, 1389
Rendering, 682, 786–788
Rendering UI components. *See* component rendering model.
replace function, 561–562
Representing a single client, 831–833
Representing business objects, 833–838
Request encoding, 825–826
request object, 492
Request processing, 663–665
Request URIs, protected, 1094
Request values phase, 666
Request-and-response model, 11. *See also* SOAP.
RequestDispatcher interface, 461
requestEncoding tag, 554
Request.java, 371–373
Request/reply mechanism
 JMSCorrelationID message header field, 1170

JMSReplyTo message header field, 1170
temporary destinations and, 1199
Request-response messaging, 344, 1265–1266, 1389
Requests, 449. *See also* HTTP requests.
 appending parameters, 508
 customizing, 456–458
 filtering, 454
 getting information from, 449–450
 retrieving a locale, 821
 tracking, 468–469
requestScope object, 493
Required attribute, 1047
Required files, 845–846
Required transaction attribute, 1218
RequiresNew attribute, 1047–1048
Requiring a value. *See required attribute;*
 UI component tag attributes.
Reserved words, JSP pages, 494
Reserved words, XML, 36
Resource adapter, JAXR, 394
 creating resources, 429
Resource Adapter Archive (RAR), 1388
Resource Adapter Archive (RAR) files, 1357
Resource adapter contracts, 1359–1362
Resource adapter deployment descriptors, 13–14
Resource adapter modules, 13–14, 1390
Resource adapter security, configuring, 1148–1149
Resource adapters, 20–21, 1357–1359, 1389–1390. *See also* J2EE Connector Architecture.
 application contracts, 1359
 archive files. *See* RAR files.
 CCI, 1362
 connection management contract, 1361
 importing transactions, 1362
 JAXR, 429
 life-cycle management contract, 1359
 messaging contract, 1361
 security, 1148
 security management contract, 1361
 system contracts, 1359

- transaction management contract, 1361
- work management contract, 1359
- Resource bundles, 741, 743–744, 820, 822
 - backing options, 820
 - constructing, 820
- Resource configuration, 1289–1290
- Resource connections. *See also* connections.
 - ConfirmrBean example, 1082–1083
 - connection pools, 1077
 - data source, definition, 1077
 - database connections, 1078–1080
 - DataSource objects, 1077
 - HTMLReaderBean example, 1085–1086
 - JDBC API, 1077
 - JDBC resources, definition, 1077
 - JNDI naming, 1075–1076
 - mail session connections, 1080–1083
 - overview, 1075
 - URL connections, 1083–1086
- Resource Description Framework (RDF).
 - See* RDF.
- Resource manager connection factory, 1390
- Resource manager connections, 1390
- Resource managers, 1390
- Resource references
 - declaring, 99–100
 - mapping to data sources, 104
 - setting, 1012
 - specifying, 103–104
 - specifying in J2EE components, 1079, 1082, 1085
 - specifying in Web applications, 103
- ResourceBundles, referencing, 704–705
- Resources, 1075. *See also* data sources; mail sessions; URL connections.
 - JAXR, 429
 - JMS, 1213
- Response encoding, 487, 826–827
- response object, 492
- Responses, 451. *See also* HTTP responses.
 - buffering output, 451
 - creating, 451–453
 - customizing, 456–458
 - filtering, 454
- including other resources, 461–462
- setting headers, 448
- Result interface tag, 559–560
- Reusing content, 506–507. *See also* JSP, tag files.
- Right double quote entity, &rdquo, 61
- Rivest, Shamir, and Adelman (RSA), 1117
- RMI (Remote Method Invocation), 1390
- RMI-IIOP, 1390
- Role mapping, 1390
- Roles (development), 14–16, 1390
- Roles (security). *See also* security.
 - authorizing, 1093, 1097
 - creating, 1090, 1097
 - definition, 1088, 1090, 1391
 - versus* groups, 1090
 - mapping, 1090–1092, 1098–1100
 - method permissions, declaring, 1143
 - overview, 1088–1089
 - references, declaring, 1098–1100
 - references, linking, 1098–1100
- Rollback, 1046, 1050–1051, 1391
- rollback, 1046, 1057–1058, 1063, 1068–1069
- rollback method (JMS), 1204
- Rollbacks. *See* transactions, rollbacks.
- Root, 1391
 - element, 42
 - node, 230, 248
- Root element, 530–531
- Roster example. *See* CMP examples.
- RosterApp. *See* CMP examples.
- RosterBean. *See* CMP examples.
- RosterClient. *See* CMP examples.
- round function, 256
- RPCs (remote procedure calls), 19, 313. *See also* JAX-RPC.
- RSA (Rivest, Shamir, and Adelman), 1117
- &rtrade, registered trademark entity, 61
- Running procedures remotely. *See* JAX-RPC; RPCs.
- Runtime deployment descriptors, 12–13. *See also* deployment descriptors.

**S**

SAAJ (SOAP with Attachments API for Java), 20, 339. *See also* SOAP.
connections, 344–345
definition, 1394
deploying, 1294–1295
examples, 371
messages, 340
overview, 20, 340
SOAPConnection objects, 344–345
specification, 339
tutorial, 345
uses for, 339

SAAJ messages
with attachments, 342–344, 385–387
contents, 341
and DOM, 344
request-response, 344
without attachments, 341–342
XML document structure, 340–341

SAAJ messages, tutorial
accessing message elements, 347
actor attributes, 363–365
adding DOM documents, 381–385
AttachmentPart object, 358–361
attachments, adding, 358–361
Attachments.java, 385–387
attributes, adding, 361–366
code examples, 371–388
content, adding
AttachmentPart object, 358–360
from DOM documents, 357, 381–385
headers, 355–356, 380–381
message body, 348–353, 357
SOAPPart object, 353
content, getting, 354–355
content, manipulating, 358
creating messages, 346–347
DOMExample.java, 381–385
DOMSrcExample.java, 381–385
header attributes, 362–363
HeaderExample.java, 380–381
message headers, 380–381
message parts, 347

message with attachment, 385–387
mustUnderstand attribute, 365–366
MyUddiPing.java, 373–380
overview, 361–362
pinging UDDI, 373–380
Request.java, 371–373
retrieving fault information, 387–388
sending messages, 353–354, 371–373

SOAP faults
Detail object, 368
fault actors, 368
fault codes, 367
fault strings, 368
overview, 366–368
retrieving fault information, 369–371, 387–388

SOAPConnection object, 353

SOAPFactory class, 349

SOAPFault objects
creating, 368–369
definition, 367
populating, 368–369

SOAPFaultTest.java, 387–388

traversing DOM documents, 381–385

saveConcepts method, 408

saveOrganizations method, 408

Saving timers, 893–894

SavingsAccountBean class. *See* BMP
examples; online banking example

SAX (Simple API for XML), 115, 1344. *See also* DOM.

APIs, 107–109

compiling and running programs
documents and data, 135
events, identifying, 129–131
overview, 128
whitespace, compressing, 132–133

compiling and running programs, output
checking, 129
compressing, 132–133
inspecting, 134–135

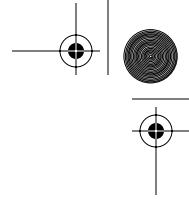
converting data to XML, 116–117

definition, 1391

**INDEX****1479**

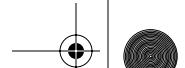
documents, locating, 136–137
versus DOM, 115
echoing entity references, 153–154
echoing external entity, 153–154
echoing XML files
 application skeleton, 118
 classes, importing, 118
 ContentHandler, 119–120
 I/O, setting up, 119
 overview, 117
 parser, setting up, 120–121
echoing XML files, event handling
 character events, 125–127
 document events, 123–124
 element events, 124–125
echoing XML files, output
 spacing, 122–123
 writing, 121–122
empty elements, 153
entities
 external, echoing, 153–154
 general, 154
 parameter, 155
 parsed, 155
 summarizing, 154–155
 unparsed, 155
entity references, echoing, 153–154
error handling
 DTD warnings, 163
 error types, 139–140
 exception classes for, 109
 fatal errors, 140
 IOException, 144–145
 nonfatal errors, 145–146
 ParserConfigurationException, 144
 SAXException, 141–143
 SAXParseException, 140–141, 143
 warnings, 146–147
event handlers
 CDATA sections, 147–149. *See also* lexical events.
 document locator, 136–137
 DTDs, 171–172
 entity resolution, 172–173

error handlers, 139–147, 161
processing instructions, 137–139
special characters, 147–149
event handlers, lexical events. *See also* CDATA sections.
comment method, 164
echoing comments, 164, 167–168
echoing lexical information, 168–171
identifying CDATA sections, 164
LexicalHandler, 164–171
startCDATA method, 165
startDTD method, 165
startEntity method, 165
events, 269
extensions, 109
external entities, echoing, 153–154
general entities, 154
helper classes, 109
ignorableWhitespace method, 151–152
interfaces, 109
lexical events. *See also* CDATA sections.
comment method, 164
echoing comments, 164, 167–168
echoing lexical information, 168–171
identifying CDATA sections, 164
LexicalHandler, 164–171
startCDATA method, 165
startDTD method, 165
startEntity method, 165
library, 106
output
 checking, 129
 compressing, 132–133
 inspecting, 134–135
 spacing, 122–123
 writing, 121–122
overview, 19
packages, 109
parameter entities, 155
parsed entities, 155
parser, choosing, 155
parser, nonvalidating
 DTD's effect on, 149–151
 error handling, 139–147

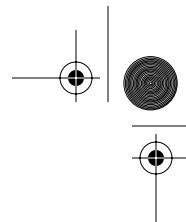


SAX (*Continued*)
parser, validating
documents, associating with schemas, 158–159
error handling, 161
error handling, setting up, 158
factory, configuring, 155–156
overview, 155
parser properties, setting, 157
validation errors, 159–161
XML schema, validating, 156–157
parsing parameterized DTDs, 162–163
processing instructions, 137–139
`processingInstruction`, 135
`processingInstruction` handler, 137–139
pull parser, 116
`setDocumentLocator`, 135, 136–137
state dependent processing, 115, 116
state independent processing, 115, 116
summarizing entities, 154–155
transforming data, 247
unparsed entities, 155
uses for, 106, 116–117
whitespace
compressing, 132–133
ignorable, 151–152
tracking, 151–152
XML, treating as text, 148–149. *See also* CDATA sections; lexical events.
XML standard, 1344–1345
SAX parser, XML Schema properties, 157
`SAXException`, 141–143
`SAXParseException`, 140–141, 143
generating, 142
`SAXParser` API, 107
`SAXParser` class, 121
`SAXParserFactory` API, 107
`SAXReader` API, 107
Scalable Vector Graphics (SVG), 1353
Schema for Object-oriented XML (SOX), 1349
Schemas. *See also* capture-schema tool.
associating a document with, 158, 238
capturing, 992

declaring
in the application, 241
in XML data set, 241
default, 242
definition, 1391
definitions, 242
specifying, 239
RDF Schema, 1352
RELAX NG, 1349
Schematron, 1350
SOX, 1349
SOX (Schema for Object-oriented XML), 1349
standards, 1348
using existing, 74
XML, 1349
 XML Schema, 1349
Schematron, 1350
Scope, transactions, 1046–1047, 1050
Scope objects, 444–445
Scope of objects, 605
Scripting
creating and using objects, 617
declarations, 620–621
disabling, 620
elements, 520–530
examples, 618–619
expressions, 622–623
finalizing JSP pages, 620–621
initializing JSP pages, 620–621
languages supported, 619
scriptlets, 621–622
tag handlers, 623–625
tags
 with bodies, 626–627
 body content, 623
 classic tags, 623
 cooperating, 627–629
 defining variables, 629–630
 `doAfterBody` method, 627
 `doInitBody` method, 626
 object sharing, 627–629
 `release` method, 627
 TDL elements, 623
using, 619

**INDEX****1481**

- variables, declaring, 620–621
- Scriptlets, 530, 621–622
- <SECT> element, 281
- Secure connection, specifying, 1097–1098
- Secure connections, 1114
- Secure Socket Layer (SSL). *See* SSL.
- Security
 - See also* authentication
 - See also* containers
 - See also* JAAS
 - See also* online banking example
- application client tier, 1145
 - callback handlers, 1146
 - login modules, 1146
- application client-tier security, 1145–1146
- attributes, 1391
- certificate realm, 1088–1089
- component-managed sign-on, 1148
- constraints, 1094
 - configuring, 1093, 1095
 - definition, 1094, 1391
- container trust relationships, 1151
- container-managed sign-on, 1147
- context, 1392
- credentials for XML registries, 404
- declarative, 1087
- deployment descriptors
 - creating, 1092–1100
 - example, 1131
 - viewing, 1092, 1112
- digital certificates
 - for Application Server, 1115, 1119–1120
 - client-side, creating, 1120–1121
 - keytool, 1116, 1121
 - mutual authentication, 1120–1121
 - overview, 1115–1116
 - principal name, 1089
 - server-side, creating, 1116–1118
 - signing, 1118–1119
- EIS tier, 1147
 - component-managed sign-on, 1148
 - container-managed sign-on, 1147
- sign-on, 1147
- EIS-tier, 1147–1149
- EJB tier, method permissions. *See* method permissions.
- EJB-tier, 1142–1145
- elements, setting, 1092–1100
- examples
 - basic authentication, 1126–1133
 - client-certificate authentication, 1133–1142
 - form-based authentication, 1105–1114
 - mutual authentication, 1133–1142
- file realm, 1088–1089
- form-based authentication
 - configuring, 1097–1098
 - example, 1105–1114
 - overview, 1101–1102
 - protecting passwords, 1113–1114
- groups, 1088
 - overview, 1088–1089
 - roles, mapping, 1090–1092
- identities, 1149–1151. *See also* roles, mapping
 - client authentication, configuring, 1151
 - configuring, 1150–1151
 - propagating, 1149–1151
 - trust between containers, 1151
- intranet security, 1143–1145
- IOR security, configuring, 1143–1145
- J2EE *versus* operating system, 1088
- JACC, 1151
- JSP pages, adding security to, 1097
- keystores, 1116–1117, 1135
- login authentication
 - example, 1105–1114
 - overview, 1100–1105
- method permissions, declaring, 1143
- mutual authentication
 - certificates, creating, 1116–1118, 1120–1121
 - enabling, 1123–1124
 - example, 1133–1142
 - overview, 1103–1105
 - verifying, 1124



Security (*Continued*)
network security requirements, 1093, 1096–1097
overview, 8, 1087–1092
passwords, protecting, 1097–1098, 1113–1114
permission sets, 1392
permissions, 1392
policy domains, 1392
programmatic, 1087, 1098, 1145
programmatic security
 EJB tier, 1145
 Web tier, 1098–1100
propagating security identity, 1149–1151
protecting enterprise beans, 1309
protecting passwords, 1097–1098, 1113–1114
protecting Web client resources, 1325–1326
protecting Web resources, 1094
realms, 1088–1089
request URIs, protected, 1094
resource adapter security, 1148
resource adapters, 1148
roles, 1088
 authorizing, 1093, 1097
 creating, 1090, 1097
 definition, 1088, 1090, 1391
 versus groups, 1090
 mapping, 1090–1092, 1098–1100
 method permissions, declaring, 1143
 overview, 1088–1089
 references, declaring, 1098–1100
 references, linking, 1098–1100
secure connection, specifying, 1097–1098
servlets, adding security to, 1097
session management, 1098
SSL connector, 1122–1124
SSL support
 and basic authentication, 1113–1114
 components of, 1115
 confidentiality, 1114
 definition, 1114–1115
 digital certificates, 1115–1122

and form-based authentication, 1113–1114
integrity, 1114
mutual authentication, enabling, 1123–1124
mutual authentication, verifying, 1124
overview, 1114–1115
passwords, protecting, 1097–1098, 1113–1114
protecting passwords, 1113–1114
running, 1122–1123
secure connection, specifying, 1097–1098
session management, 1098
SSL connector, 1122–1124
 verifying, 1122
technology domains, 1392
transport-level security, 1125–1126
trust-stores, 1117, 1135
unauthenticated access, 1145
unrestricted access, allowing, 1094
URIs, protected, 1094
users, 1088
 adding to Application Server, 1089
 determining name, 1098
 determining role, 1098
 J2EE *versus* operating system, 1088
 managing, 1089
 overview, 1088–1089
 roles, mapping, 1090–1092
verifying
 mutual authentication, 1124
 SSL support, 1122
views, 1392
Web resource collections
 defining, 1093, 1096
 editing content, 1096
Web services, 1133–1142
Web services security
 basic authentication, 1126–1133
 mutual authentication, 1133–1142
 overview, 1125–1126
Web tier, programmatic, 1098
Web-tier, 1092–1100

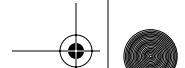
**INDEX****1483**

- X.509 certificates
 - common name field, 1089
 - definition, 1102–1103
 - overview, 1089
- XML
 - basic authentication example, 1126–1133
 - client-certificate authentication example, 1133–1142
 - mutual authentication example, 1133–1142
 - overview, 1125–1126
- Security constraints, 1094
- Security identity, 1149
 - caller identity, 1149
 - propagating to enterprise beans, 1149
 - specific identity, 1149
- Security management contract, 1361
- Security role references, 1098
 - mapping to security roles, 1099
- Security roles, 1090
 - creating, 1090
 - Duke's Bank, 1309
 - mapping to users and groups, 1091
- SEI (service element endpoint), 315, 316–318
- SELECT clause, 1040–1043
- Select methods, 944, 958, 978, 990
 - EJB QL, 1022, 1041
- Selection criteria, 250
- selectItem tag, 703
- selectItems tag, 701–703
- selectManyCheckbox tag, 698
- selectOneMenu tag, 699–700
- Selector methods. *See* select methods.
- Self-referential relationships, 985–986
- send method, 1166
- Serializers, generating. *See* wscompile tool.
- Server, authentication, 1102
- Server authentication, 20. *See also* JAX-RPC.
- Server certificates, 1116–1118, 1392. *See also* digital certificates.
- Server log, 25, 28–29
- Server principals, 1392
- Servers
 - authenticating, 1133
 - certificates, 1115
- Servers, components that run on, 3
- Servers, J2EE
 - deploying on more than one, 1239, 1246
 - running JMS clients on more than one, 1187
- Server-side utility classes, 6. *See also* Web components.
- Service bindings
 - adding to an organization with JAXR, 407
 - finding with JAXR, 403
- Service bindings, JAXR
 - connections, 403
 - organizations, 407
 - specification concepts, 408–410
- Service element endpoint (SEI), 315, 316–318
- Service elements, 1392
- Service endpoint interfaces, 1392
- Service methods, 448
- Service-oriented Web applications, 81
- Services
 - adding, 407
 - adding to an organization with JAXR, 407
 - finding, 403
 - finding with JAXR, 403
- Servlet classes, 13, 18. *See also* servlets.
- Servlet containers, 1393
- Servlet containers, distributed, 1393
- Servlet context, 1393
- Servlet interface, 435
- Servlet mapping, 1393
- ServletContext interface, 463
- ServletContext object, 492
- ServletInputStream class, 449
- ServletOutputStream class, 451
- ServletRequest interface, 449
- ServletResponse interface, 451
- Servlets, 435. *See also* JSP.
 - accessing Web context, 463–464
 - adding security to, 1097

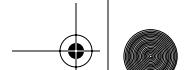
**Servlets (*Continued*)**

binary data
reading, 449
writing, 451
character data
reading, 449
writing, 451
client state
accessing sessions, 464
associating objects with sessions, 465
notifying session objects, 465
session management, 466
session tracking, 466–467
containers, 10
database access, 21, 446–447
definition, 1393
Duke's Bank, 1323
error handling, 443–444
examples, 84, 436–441
`Filter` interface, 454–456
filter mappings, 458–460
`FilterChain` interface, 454–456
`FilterConfig` interface, 454–456
filtering requests and responses, 454
filters, 454–456
finalizing, 467–470
initializing, 447–453
life cycle, 441–444
listener class, 442–443
long-running methods, shutting down, 470
overview, 3, 6, 435–436
requests
customizing, 456–458
filtering, 454
getting information from, 449–450
tracking, 468–469
responses
creating, 451–453
customizing, 456–458
filtering, 454
including other resources, 461–462
scope objects, 444–445
service methods, 448

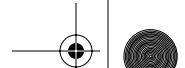
notifying, 469
programming long running, 470
shared resources, concurrent access, 445–446
sharing information, 444–447
shutdown, 469
tracking service requests, 468
transferring control, 462–463
Session beans, 7, 17, 831
See also backing beans
See also enterprise beans
See also entity beans
See also message-driven beans
See also transactions, container-managed
access control, 844–845
activation, 847
clients, 831
compared to entity beans, 833
container-managed relationships, 842
creating, 937
database access, 17, 21
databases, 1052
defining client access, 840–845
definition, 1393
description, 831–838
Duke's Bank, 1303, 1306
equality, 891
examples, 855, 873, 890, 1222
finder methods, 841
granularity of data, 844–845
home interface, 841
home methods, 841
instance variables, synchronizing, 1052–1053
isolation, 844
isolation levels, 1071
life cycle, 848–850
local clients, 841–842
local interfaces, 842
messages. *See JMS*.
online banking example, 1303–1306
overview, 7, 17, 21
packaging, 937
passivation, 847

**INDEX****1485**

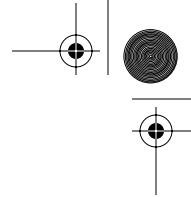
- remote access vs. local, 842–843
- remote clients, 840–841
- remote interface, 841
- requirements, 874
- stateful, 832
- stateless, 831, 833
- transaction types allowed, 1069
- transactions, 1049, 1051–1052, 1058, 1068–1069, 1073
 - vs. entity beans, 833–834
 - vs. message-driven beans, 838–840
- Web service clients, 843–844
- Web service endpoint interface, 844
- Web services, 844, 885
- Session beans, examples
 - accessing environment entities, 890–891
 - application exceptions, 901–902
 - comparing enterprise beans, 891
 - enterprise beans
 - application exceptions, 901–902
 - exception handling, 901–902
 - system exceptions, 901–902
 - exception handling, 901
 - object references, passing, 891–892
 - shopping cart
 - building the example, 880
 - business methods, invoking, 877–878
 - business methods, signature, 878
 - enterprise beans, packaging, 881
 - helper classes, 880
 - home interface, 878–879
 - instantiating the beans, 876–877
 - remote interface, 879–880
 - shopping cart, application client
 - creating, 880–881
 - deploying, 883–884
 - enterprise bean reference, specifying, 883
 - packaging, 882
 - running, 884
 - system exceptions, 901–902
 - timer service
 - application, creating, 896
 - cancelling, 893–894
- creating, 893, 895–896
- enterprise beans, packaging, 897
- getting information about, 894
- overview, 892
- saving, 893–894
- transactions and, 894
- timer service, application client
 - compiling, 898
 - deploying, 899–900
 - enterprise bean reference, specifying, 899
 - packaging, 898
 - running, 900–901
- Web service
 - application, creating, 886
 - application, deploying, 888
 - enterprise beans, packaging, 887–888
 - stateless session bean implementation class, 885
 - Web service client, 888–889
 - Web service endpoint interface, 884–885
- Session interface, 1165
- Session management, 1098
- session object, 492
- SessionBean interface, 876
- SessionContext interface, 892
- Sessions, 464
 - accessing, 464
 - associating attributes, 465
 - associating objects with, 465
 - associating with user, 466
 - definition, 1393
 - invalidating, 466
 - JMS, 1165–1166
 - managing, 466
 - notifying objects, 465
 - notifying objects associated with, 465
 - tracking, 466–467
- Sessions, JMS
 - introduction, 1165
 - managing in J2EE applications, 1213
- sessionScope object, 493
- set tag, 543–544, 550, 551–552



setAttribute method, 604
setBundle tag, 554–555
setCoalescing method, 212
setContent method, 356, 359
setDataSource tag, 556–558
setDocumentLocator, 135, 136–137
setDynamicAttribute method, 601
setEntityContext method, 848, 926, 928
setExpandEntityReferences method, 212
setExpandingEntityReferences method, 212
setIgnoringComments method, 212
setIgnoringElement method, 212
setIgnoringElementContentWhitespace method, 212
setLocale tag, 554–555
setMessageDrivenContext method, 851, 1215
setPostalAddresses method, 416
setRollbackOnly method, 1050–1051, 1218
setSessionContext method, 847, 892
Setters. *See* access methods.
setTimeZone tag, 554
Settings, viewing, 972–980
SGML (Standard Generalized Markup Language), 64, 1393
SGML/XML Web page, 40
Shared access, enterprise beans, 834
Shared objects, JSP pages, 488–489
Shared resources, concurrent access, 445–446
Sharing information, 444–447
Shopping cart example
 application, creating, 880–881
 application client
 deploying, 883–884
 enterprise bean reference, specifying, 883
 packaging, 882
 running, 884
 building the example, 880
 business methods, invoking, 877–878
business methods, signature, 878
enterprise beans, packaging, 881
helper classes, 880
home interface, 878–879
instantiating the bean, 876–877
instantiating the beans, 876–877
overview, 873–874
remote interface, 879–880
session bean class, 874–875
SessionBean interface, 876
Shutdown, servlet for, 469
Signing digital certificates, 1118–1119
Simple API for XML (SAX). *See* SAX.
Simple attributes, 569, 585–586, 586–588
Simple custom tags, 568
Simple Object Access Protocol (SOAP). *See* SOAP.
Simple parser, creating, 267
Simple tags. *See also* tag files.
 attributes
 dynamic, 570
 fragment, 570
 simple, 569
 with bodies, 572
 examples, 608, 610
 expression language variables, defining, 572
 shared objects, 606
 example, 607–608
 named, 606
 private, 606
 specifying body of, 572
 tag handlers, 598
 with attributes, 600
 with bodies, 602
 defining scripting variables, 604
 how invoked, 599
 supporting dynamic attributes, 601
 variables, providing information about, 597, 605–606
SimpleMessageApp. *See* message-driven beans example.
SimpleTag interface, 598
SimpleTagSupport class, 598

**INDEX****1487**

- SingleThreadModel interface, 445
Slash (/), JSP operator, 494
SMIL (Synchronized Multimedia Integration Language), 1353
SOAP (Simple Object Access Protocol), 313–314, 337, 339. *See also SAAJ.*
body, 351
 adding content, 348
 Content-Type header, 359
definition, 1394
envelope, 350
headers
 adding content, 355
 Content-Id, 359
 Content-Location, 359
 Content-Type, 359
 example, 380
interoperability, 337
and JAX-RPC, 19
overview, 11
SOAP faults, 366
 detail, 368
 Detail object, 368
 fault actor, 368
 fault actors, 368
 fault code, 367
 fault codes, 367
 fault string, 368
 fault strings, 368
 overview, 366–368
 retrieving fault information, 369–371, 387–388
 retrieving information, 369
 SAAJ example, 387
SOAP messages, 11. *See also SAAJ messages.*
SOAP with Attachments API for Java. *See SAAJ.*
SOAP with Attachments API for Java (SAAJ). *See SAAJ.*
SOAPBody interface, 341, 351
SOAPBodyElement interface, 348, 351, 377
SOAPConnection class, 344
 getting objects, 353
SOAPConnection object, 353
SOAPConnection objects, 344–345
SOAPElement interface, 349, 378
SOAPEnvelope interface, 341, 348, 350
SOAPFactory class, 349
SOAPFault interface, 367
 creating and populating objects, 368
 detail element, 368
 fault actor element, 368
 fault code element, 367
 fault string element, 368
SOAPFault objects
 creating, 368–369
 definition, 367
 populating, 368–369
SOAPFaultTest.java, 387–388
SOAPHeader interface, 341, 355
SOAPHeaderElement interface, 349, 355
SOAPMessage class, 341, 347
SOAPPart class, 341, 344, 350
 adding content, 356
SOAPPart object, 353
Sorting output, 301
SOX (Schema for Object-oriented XML), 1349
Special characters
 character references, 50
 hexadecimal to decimal conversion, 50
 SAX, 147–149
 treating as text, 51
 Unicode values, 50
Specification concepts, 408–410
 publishing with JAXR, 408, 423
 removing with JAXR, 424
Specifications, 35
split function, 561–562
Sports team roster example. *See CMP examples.*
SQL (Structured Query Language), 17, 21, 835, 903, 905–908, 914, 980, 1019, 1028, 1051, 1058, 1394
SQL library, 541–542, 556–560
SQL92, 1015, 1038
SQL/J, 1394



Square brackets ([])
 JSP operators, 491–492
 XPath pattern matching, 250
SSL (Secure Sockets Layer), 1101–1102,
 1114, 1133
 definition, 1102, 1391, 1394
 and JAX-RPC, 19–20
 verifying support, 1122
SSL connector
 configuring, 1122–1124
 mutual authentication, enabling,
 1123–1124
 mutual authentication, verifying, 1124
 running, 1122–1123
 tips, 1122–1123
 verifying SSL support, 1122
SSL support
 and basic authentication, 1113–1114
 components of, 1115
 confidentiality, 1114
 definition, 1114–1115
 digital certificates, 1115–1122
 and form-based authentication,
 1113–1114
 integrity, 1114
 mutual authentication, enabling,
 1123–1124
 mutual authentication, verifying, 1124
 overview, 1114–1115
 passwords, protecting, 1097–1098,
 1113–1114
 running, 1122–1123
 secure connection, specifying, 1097–1098
 session management, 1098
 SSL connector, 1122–1124
 verifying, 1122
Standalone, 35
Stand-alone modules, 13–14
Standard converters, 652
 Converter implementation classes, 706
 converter tags, 678, 680, 707
 NumberConverter class, 706
 three ways to register on a UI component,
 706

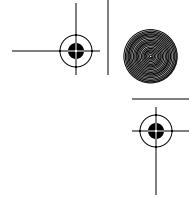
using, 705–710
Standard Generalized Markup Language
 (SGML), 64, 1393
Standard validators, 654
 using, 712–714
 validator implementation classes. *See* val-
 idator implementation classes.
 validator tags. *See* validator tags.
Standards, XML, 74
startCDATA method, 165, 169
startDocument method, 119, 123
start-domain command, 25–27
startDTD method, 165, 169
startElement method, 119, 124, 126
startEntity method, 165, 169
starts-with function, 255
State
 dependent processing, 115, 116
 independent processing, 115, 116
 information, getting, 944
 management modes, 831–832
 saving and restoring, 785–786
 specifying save location, 815
Stateful session beans
 definition, 1394
 life cycle, 847–848
 overview, 832
 returning without committing, 1068
StateHolder interface, 646
Stateless session beans
 definition, 1394
 implementation class, 885
 life cycle, 848
 overview, 831–832
Static content. *See also* JSP.
 JSP documents, 527–530
 JSP pages, 486–487
Static stub clients, 321–324
Static stubs, 321
StAX (Streaming API for XML), 1345
Storing
 backing beans, 659
 instance variables, 907–908
Streaming API for XML (StAX), 1345

**INDEX****1489**

- S**StreamMessage interface, 1171
string function, 256
String functions, 255, 561–562
String values of elements, XPath, 253
string-length function, 255
String-value, 251, 253
Structure elements, XML to HTML, 283–286, 291–296
Structure tags, XML to HTML, 280
Structured Query Language (SQL), 21, 1394
Stubs, 321
Stubs, generating. *See wscompile tool*.
Stylability, XML, 37
style attribute, 683
styleClass attribute, 683
Stylesheet, 37
Stylesheets. *See XML*.
Subcontexts, JNDI, 1076
Subscription names, for durable subscribers, 1200
Substitution parameters, defining. *See messages; param tag*.
substring function, 255, 561–562
substringAfter function, 561–562
substring-after function, 255
substringBefore function, 561–562
substring-before function, 255
Subtree
 concatenation, 219
 writing, 263
sum function, 256
Summarizing entities, 154–155
Sun Java System Application Server Platform Edition, 823. *See also Application Server*.
sun-moduleType.xml, 13
Supports attribute, 1048
SVG (Scalable Vector Graphics), 1353
SXSLTC, 1400
Synchronized Multimedia Integration Language (SMIL), 1353
Synchronous message consumption, 1161
 JMS client example, 1174
Synchronous message receives
compiling, 1177
in J2EE applications, 1212–1213
JMS administered objects, creating, 1178–1180
JMS providers, starting, 1177
overview, 1174
packaging, 1181
receiving program, 1176–1177
running, 1182–1183
sending program, 1174–1176
synchronous messaging, 1174
writing the programs, 1174–1177
Synchronous messages, 1161
System administrators, 1394
System exceptions, 901–902
SYSTEM keyword, 62–63
System.out.println method, 28
Systems integration, 22–23

T

- Table schema, capturing, 959–960
Tables, data, 694–696
Tag, renderer component combinations, 764–765
tag element, 594–595
Tag files, 563, 573. *See also JSP, tag files*.
 attribute directive, 579
 bodies, evaluating, 584
 body-content attribute, 579
 customizing behavior, 579
 declaring expression language variable, 579
 declaring tag attributes, 579
 directives, 576
 dynamic attributes, example, 588
 fragment attributes
 evaluating, 584
 example, 586
 storing evaluation result, 585
 location, 576
 packaged, 593
 simple attributes, 585
 example, 585

Tag files (*Continued*)

- specifying body content type, 579
 - tag directive, 576, 578
 - unpackaged, 591
 - implicit TLD, 592
 - variable directive, 579
 - variable synchronization with calling page, 580, 584
 - variables, example, 586
- Tag handlers, 563, 623–625, 753–754, 772–776. *See also* JSP, tag handlers.
- classic, 563. *See also* classic tags, tag handlers.
- making available to Web applications, 599
- simple. *See* simple tags, tag handlers.
- Tag interface, 623
- Tag libraries. *See also* JSP, tag libraries; JSTL.
 - accessing implementation from Web applications, 505
 - referencing TLD directly, 504
 - referencing TLD indirectly, 504
 - referencing via absolute URI, 505
- Tag library descriptor (TLD). *See* TLD.
- Tag library descriptors, 576, 589
 - attribute element, 595
 - body-content, 579
 - body-content element, 595, 623
 - filenames, 503
 - listener element, 591
 - mapping name to location, 505
 - tag element, 594
 - subelements, 594
 - tag-file element, 591
 - taglib, subelements, 589
 - taglib element, 589
 - validator element, 590
 - variable, 597
- TagData class, 605
- TagExtraInfo, 600
- TagExtraInfo class, 604–606
- tag-file element, 591
- taglib directive, 503

Tags, 31, 33

- See also* JSP, custom tags
- See also* JSTL tags
- See also* scripting, tags
- See also* XML tags
- closing, 33
- content, 296
- custom, 753–755
- empty, 33
- JavaServer Faces, list of, 648–651
- nesting, 33
- standard set, 24
- structure, 296

TagSupport class, 623

- Target namespace, 242
- Target server, changing, 1112

Taxonomies

- finding with JAXR, 406
- ISO, 3166 400
- NAICS, 400, 421
- UNSPSC, 400
- user-defined, 412
- using to find organizations, 401

Taxonomies (classifications)

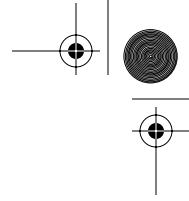
- adding, 406
 - defining, 412–414
 - finding organizations by, 401–403
 - postal addresses, specifying, 414–416
- TDL elements, scripting, 623
- Team roster example. *See* CMP examples.
- TeamBean. *See* CMP examples.
- tei-class element, 606

TellerBean example. *See* examples, bean-managed JTA transactions.

- Template tag library, 610–613
- Templates, 249, 283. *See also* JSP.
 - definition, 1394
 - mode-based, 301
 - named, 298
 - ordering in a stylesheet, 294
 - overview, 18
 - in style sheets, 294
 - transforming XML to HTML, 294XPath, 249

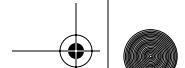
INDEX**1491**

- Temporary JMS destinations, 1199
 examples, 1233, 1248
- terminate clause, 286
- Test document, creating, 281
- Text, 222, 230, 233
 displaying in a JTree, 222
 DTD definitions, 54
 fields, user interface, 639, 690–694
 labels, 690–694
 node, 248
 nodes, 175, 230–231
 transforming XML to HTML, 280
- text method, 178
- Text nodes, 206
- Text-based documents, 6, 18. *See also* JSP
- TextMessage interface, 1171
- Thick clients, 5
- Thin clients, 4–5
- Thread management, 1360
- Three-tiered applications, 2–3. *See also* applications.
- Tiered applications, 2–3. *See also* applications.
- Ties, generating. *See* wscompile tool.
- Time conversion, 707–709
- Time tags, 556
- TimedObject interface, 892
- Timeouts, 1070
- Timeouts, transactions, 1070
- Timer interface, 892
- Timer service, 892
 cancelling timers, 893
 creating timers, 893
 examples, 895
 exceptions, 894
 getting information, 894
 saving timers, 893
 transactions, 894
- Timer service example
 application, creating, 896
 application client
 compiling, 898
 deploying, 899–900
 enterprise bean reference, specifying, 899
- packaging, 898
 running, 900–901
- canceling, 893–894
- creating, 893, 895–896
- enterprise beans, packaging, 897
- getting information about, 894
- overview, 892
- saving, 893–894
- transactions and, 894
- TimerHandle interface, 892
- TimerService interface, 892
- Timestamps for messages, JMSTimestamp
 message header field, 1170
- timeZone tag, 554, 556
- <TITLE> element, 284
- TLD (tag library descriptor)
 attribute element, 595–596
 body-content element, 595
 custom UI components, 777
 event listeners, 591
 listener element, 591
 overview, 589
 packaged tag files, 591–593
 subelements, 590
 tag element, 594–595
 tag files, declaring, 591–593
 tag handlers, declaring, 594–595
 tag handlers, declaring attributes for, 595–596
 tag handlers, declaring variables for, 596–598
 tag-file element, 591
 top-level elements, 590–591
 unpackaged tag files, 591–593
 validating JSP pages, 590
 validator element, 590–591
 variable element, 596–598
- TLS (Transport Layer Security), 19–20
- toLowerCase function, 561–562
- Tool provider role, 14
- Tool providers, 1395
- Tool vendors, 635
- Topic. *See* publish/subscribe messaging system.
- Topic interface, 1164

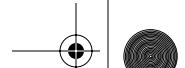


Topics
 creating, 1164, 1178
 durable subscriptions, 1200
 introduction, 1164
 looking up, 1164
 temporary, 1199, 1248
toUpperCase function, 561–562
™, trademark entity, 61
Trademark entity, **™**, 61
Transaction attributes, 1395
Transaction inflow, 1362
Transaction isolation level, 1395
Transaction management contract, 1361
Transaction managers, 8–9, 1395. *See also* containers.
transaction tag, 557–558
Transactions, 1045, 1058
 attributes, 997, 1046
 attributes, setting, 968
 auto commits, 18
 bean-managed, 1046, 1057, 1069–1070,
 1073, 1217
 boundaries, 834, 1046, 1057, 1073
 business methods. *See* business methods,
 transactions.
 commits, 1046, 1052, 1058, 1063,
 1068–1071
 container-managed, 1046, 1057,
 1068–1070, 1217
 defined, 1045
 definition, 1045–1046, 1395
 demarcating, 1046, 1073
 distributed, 1216–1219
 distributed, JMS, 1216
 entity beans. *See* entity beans, transactions.
 examples, 1051–1052, 1058, 1063, 1071,
 1206
 exceptions. *See* exceptions; transactions.
 interface for demarcating, 18
 invoking in Web components, 447
 isolation levels, 1070
 JDBC, 1058, 1069, 1071
 JMS and J2EE applications, 1213

JTA, 1058, 1063, 1069–1070
local, JMS, 1204
managers, 1049, 1058, 1063, 1071
message-driven beans, 839, 1046, 1049,
 1057–1058, 1069
multiple databases, 1071–1072
nested, 1046, 1063
options, summary table, 1069
overview, 8–9, 18, 1045–1046, 1213
Required attribute, 1218
rollbacks, 18, 1046, 1050, 1052, 1058,
 1063, 1069–1070
scope, 1046
session beans. *See* session beans, transactions.
shared data, 834
timeouts, 1070
timer service, 894
and timers, 894
tips, 1069
types allowed, 1069
Web components, 1073
in Web components, 1073
XA, 1361
Transactions, bean-managed
about, 1057–1058
Connection interface methods,
 1058–1059, 1069, 1073
definition, 1367
distributed transactions, 1217
example, JDBC transactions
 application client, packaging, 1061
 application client, running, 1062–1063
 application client, specifying enterprise
 bean reference, 1062
 compiling, 1059
 deploying, 1059
 enterprise bean, packaging, 1060–1061
 J2EE application, creating, 1060
 J2EE application, deploying, 1062
 packaging, 1059
 running, 1059
example, JTA transactions
 application client, packaging, 1066

**INDEX****1493**

- application client, running, 1068
- application client, specifying enterprise bean reference, 1067
- compiling, 1064
- deploying, 1064
- enterprise bean, packaging, 1065–1066
- J2EE application, creating, 1065
- J2EE application, deploying, 1067–1068
- packaging, 1065
- running, 1064
- isolation levels, 1070–1071
- JDBC transactions, choosing, 1058–1059, 1069
- JTA transactions, choosing, 1063–1064, 1069
- overview, 1057–1058
- prohibited methods, 1068
- returning without committing, 1068
- stateful session beans, returning without committing, 1068
- timeouts, 1070
- `UserTransaction` interface methods, 1063–1064, 1069, 1073
- Transactions, container-managed
 - about, 1046
 - `afterBegin` method, 1052
 - `afterCompletion` method, 1052–1053
 - attributes, definition, 1046–1047
 - attributes, list of, 1050
 - attributes, setting, 1049–1050
 - definition, 1369
 - distributed transactions, 1217
 - example
 - application client, packaging, 1055
 - application client, running, 1056
 - application client, specifying enterprise bean reference, 1055–1056
 - compiling, 1053
 - enterprise bean, packaging, 1054
 - J2EE application, creating, 1053
 - J2EE application, deploying, 1056
 - packaging, 1053–1055
 - instance variables, synchronizing, 1052–1053
- isolation levels, 1070–1071
- limitations, 1057
- Mandatory** attribute, 1048
- Never** attribute, 1049
- NotSupported** attribute, 1048
- prohibited methods, 1057
- Required** attribute, 1047
- RequiresNew** attribute, 1047–1048
- rollbacks, 1050–1051
- scope, 1046–1047, 1050
- `setRollbackOnly` method, 1050–1051
- Supports** attribute, 1048
- timeouts, 1070
- Transferring control, 462–463, 507–508
- `transform` tag, 550, 553–554
- Transformation tags, 553–554
- Transformations
 - from the command line, 303
 - concatenating, 303
- Transformations, concatenating, 303–310
- Transformer, creating, 259
- Transforming data
 - DOM (Document Object Model), 247
 - XML to/from other forms. *See also* XPath; XSLT.
- `translate` function, 255
- Translation, JSP pages, 483–484
- Transport Layer Security (TLS), 19–20
- Transport protocols, 10–12. *See also* Web services.
- Transport-level security
 - basic authentication, 1126–1133
 - client-certificate authentication, 1133–1142
 - mutual authentication, 1133–1142
 - overview, 1125–1126
- Traversing DOM nodes, 234
- Tree, displaying, 205
- Tree (graph) of beans, 799–801
- `TreeModel`, adapting to `JTree`, 195–204
- `TreeModelSupport` class, 204
- `trim` function, 561–562
- `true` function, 256
- Trust-stores, 1117, 1135

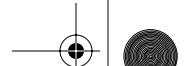


Tutorials. *See* bookstore example; SAAJ messages, tutorial.
Two-way authentication. *See* mutual authentication.
Typographical conventions, xlivi

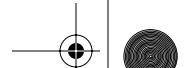
U

<u> (underline) tag, 280
UBL (Universal Business Language), 1354
UDDI (Universal Description, Discovery, and Integration). *See also* JAXR.
accessing registries with SAAJ, 373
definition, 1395
getting access to public registries, 394
pinging, 373–380
registries, 390–391
uses for, 12
UI component behavioral interfaces, 646
ActionSource interface, 646, 652, 657, 719, 721, 747, 778, 790
ConvertibleValueHolder interface, 646, 778
EditableValueHolder interface, 646, 778
NamingContainer interface, 646, 778
StateHolder interface, 646, 779, 785
ValueHolder interface, 646, 779
UI component classes, 645–647, 762
 javax.faces.component package, 778
 SelectItem class, 700, 703, 736–737
 SelectItemGroup class, 737
 SelectItems class, 683
 UIColumn class, 645
 UICommand class, 645, 647
 UIComponent class, 645, 647
 UIComponentBase class, 645, 778, 780
 UIData class, 645
 UIForm class, 645
 UIGraphic class, 645
 UIInput class, 645, 653, 657
 UIMessage class, 646
 UIMessages class, 646
 UIOutput class, 646, 652

UIPanel class, 646
UIParameter class, 646
UISelectBoolean class, 646, 697
UISelectItem class, 646, 700
UISelectItems class, 646, 700
UISelectMany class, 646, 697
UISelectOne class, 646–647, 699
UIViewRoot class, 646, 676
UI component properties. *See* backing bean properties.
UI component renderers
 Grid renderer, 695
 Group renderer, 695
 Hidden renderer, 691
 Label renderer, 691
 Link renderer, 691
 Message renderer, 691
 Secret renderer, 691
 Table renderer, 686
 Text renderer, 690–691
 TextArea renderer, 691
UI component tag attributes, 681–683, 681–683
 action attribute, 657, 755, 768, 775
 actionListener attribute, 657, 685, 711, 719–721, 749, 757, 763, 768, 775, 789
 alt attribute, 690, 768
 for attribute, 692, 699
 attributes referencing backing bean methods. *See* attributes referencing backing bean methods.
 basename attribute, 704
 binding attribute, 642, 658, 681, 683, 714, 718
 columns attribute, 695–696
 converter attribute, 690, 706–707, 723–724
 first attribute, 689
 headerClass attribute, 695
 id attribute, 681
 immediate attribute, 681, 681–682, 768
 itemLabel attribute, 703
 itemValue attribute, 703

**INDEX****1495**

- locale attribute, 677
- redisplay attribute, 694
- rendered attribute, 681–682, 719
- required attribute, 713
- rows attribute, 689
- size attribute, 697, 699
- style attribute, 681, 683, 689, 699
- styleClass attribute, 681, 683
- url attribute, 690
- usemap attribute, 690, 726
- validator attribute, 657, 691, 758
- value attribute, 639, 642, 681, 683, 685, 688–689, 692–693, 698, 702, 714–716, 730, 768–769
- valueChangeListener attribute, 657, 691, 711, 722–723, 758
- var attribute, 688, 705
- UI component tags, 648–651, 653, 681, 730
 - attributes. *See* UI component tag attributes.
 - column tag, 648, 684
 - commandButton tag, 639, 648, 685
 - commandLink tag, 648, 686, 712
 - dataTable tag, 648, 686–689, 732
 - form tag, 649, 683
 - graphicImage tag, 649, 768
 - inputHidden tag, 691
 - inputHidden tag, 649
 - inputSecret tag, 649, 691, 694
 - inputText tag, 639, 649, 690–691
 - inputTextarea tag, 691
 - inputTextarea tag, 649
 - message tag, 649, 698
 - messages tag, 640, 649, 698
 - outputFormat tag, 686, 693
 - outputLabel tag, 649, 691–692
 - outputLink tag, 649, 691–692
 - outputMessage tag, 691
 - outputText tag, 650, 691–692, 733
 - panelGrid tag, 650, 695
 - panelGroup tag, 650, 688, 694–696
 - selectBooleanCheckbox tag, 650, 697, 734
 - selectItems tag, 737
- selectManyCheckbox tag, 650, 697–698, 734
- selectManyListbox tag, 650, 697
- selectManyMenu tag, 650
- selectOneListbox tag, 651, 699
- selectOneMenu tag, 651, 699–700, 735–736
- selectOneRadio tag, 651, 699
- UI components
 - buttons, 648
 - checkboxes, 650
 - combo boxes, 650–651
 - custom UI components. *See* custom UI components.
 - data grids, 648
 - hidden fields, 649
 - hyperlinks, 648
 - labels, 649–650
 - list boxes, 650–651
 - password fields, 649
 - radio buttons, 651
 - table columns, 648
 - tables, 650
 - text areas, 649
 - text fields, 649
- UIColumn class, 645
- UIColumn component, 684
- UICommand class, 645, 648
- UICommand component, 684–686
- UIData class, 645
- UIData component, 686–689
- UIData property, 732–733
- UIForm class, 645
- UIForm component, 683–684
- UIGraphic class, 645
- UIGraphic component, 690
- UIInput class, 645
- UIInput component, 690–694
- UIInput property, 731–732
- UIMessage class, 646
- UIMessage component, 698–699
- UIMessages class, 646
- UIMessages component, 698–699
- UIOutput class, 646



UIOutput component, 690–694
UIOutput property, 731–732
UIPanel class, 646
UIPanel component, 694–696
UIParameter class, 646
UISelectBoolean class, 646
UISelectBoolean component, 697
UISelectBoolean property, 734
UISelectItem class, 646
UISelectItem component, 700–703
UISelectItem property, 736
UISelectItemGroup component, 700–703
UISelectItems class, 646
UISelectItems component, 700–703
UISelectItems property, 737–739
UISelectMany class, 646
UISelectMany component, 697–698
UISelectMany property, 734–735
UISelectOne class, 646
UISelectOne component, 699–700
UISelectOne property, 735–736
UIViewRoot class, 646
Unauthenticated access, 1088, 1145
UnavailableException class, 447
Undeploying Web modules, 95
Underscore (_)
 Java localization classes, 819
 in XML markup, 43
Unicode, 1395
 Unicode values for special characters, 50
Unidirectional relationships, 837–838, 987
Uniform resource identifier (URI), 1094, 1396
Uniform resource locator (URL). *See* URL
Uniform resource name (URN), 1396
Universal Business Language (UBL), 1354
Universal Description, Discovery, and Integration (UDDI). *See* UDDI
Universal Standard Products and Services Classification (UNSPSC), 400, 1395
Unpackaged tag files, 591–593
Unparsed entities
 definition, 63, 1396
 recognizing, 109
 referencing, 64–66
Unparsed entity, 63, 155
unparsedEntityDecl method, 172
Unrestricted access, 1094
unsetEntityContext method, 850
UNSPSC (Universal Standard Products and Services Classification), 400, 1395
Update model values phase, 667–668
update tag, 557–558
Updating Web modules, 92–95
URI (uniform resource identifier), 1094, 1396
URL (uniform resource locator)
 connections from enterprise beans, 1083–1086
 definition, 1396
 mapping to Web components, 96–97
 path, 1396
 resource manager, 1076
URL connections, 1083
url tag, 544
URL tags, 548–549
URLs, connecting to from J2EE components, 1083
URN (uniform resource name), 1396
US-ASCII encoding, 1341
User authentication. *See* authentication.
User data constraints, 1396
User input
 buttons, 685
 forms, 683–684
 hiding, 694
 requiring values, 712–714
 selecting from a list
 checkboxes, 697–698, 703–704
 combo boxes, 699–700, 703–704
 component properties, 734–739
 drop-down lists, 699–700, 703–704
 list boxes, 697–698, 703–704
 menus, 697–698, 699–700, 703–704
 text fields, 690–694
 validation, 714



User interface, online banking example
 creating, 1313
 getting data from, 1315–1317
 updating, 1313

User interface component model. *See also*
 JavaServer Faces.
 action events, 652
 behavioral interfaces, 646–647
 classes, 645–646
 component rendering model, 647–651
 conversion model, description, 651–652
 custom components. *See* JavaServer
 Faces, custom UI components.
 data validation, 654
 data-model events, 653
 event and listener model, description,
 652–653
 mapping classes to tags, 647–651
 overview, 644–645
 render kit, 647
 tags, list of, 648–651
 UICommand class, definition, 645
 UICommand class, tags, 648
 validation model, 654
 value-change events, 653

User interface components. *See* JavaServer
 Faces.

User output, 690–694

User-based authorization, 22. *See also*
 JAAS.

Username, 1127

Users, 1088
 adding to Application Server, 1089
 authorized, 8–9. *See also* containers;
 security.
 definition, 1088
 determining name, 1098
 determining role, 1098
 J2EE *versus* operating system, 1088
 managing, 1089
 overview, 1088–1089
 roles, mapping, 1090–1092
 security, 1397

UserTransaction, 1057, 1063,

1068–1070, 1073

UserTransaction interface, message-driven beans, 1217

UserTransaction interface methods,
 1063–1064, 1069, 1073

UTF-8 encoding, 825, 1341

UTF-16 encoding, 1342

Utility classes, 845, 904

V

Valid, 1397

Valid partial requests, 97–98

validate method, 600

validateLongRange tag, 640, 714

Validating. *See also* verifying.

DOM

 configuring the DocumentBuilder factory, 238
 errors, 187–188
 with multiple namespaces, 239–240
 overview, 237
 schemas, associating with documents,
 238–239
 schemas, declaring, 241–243
 with XML schema, 237–243
 JSP pages, 590
 user input data
 data ranges, 640, 714
 required input, 713
 validation model, 654
 XML files, 816
 with XML Schema, 237

Validating input. *See* validation model.

Validating parsers. *See also* parsers.
 definition, 1397

SAX
 documents, associating with schemas,
 158–159
 error handling, 161
 error handling, setting up, 158
 factory, configuring, 155–156
 overview, 155
 parser properties, setting, 157



Validating parsers (*Continued*)
validation errors, 159–161
XML schema, validating, 156–157

Validation
backing bean methods, 757–758
immediate processing, 681–682
methods, 722
model, 654
user input, 714

Validation errors, 159

Validation model, 645, 654
id attribute, 725
referencing a method that performs validation, 722
requiring a value. *See also* UI component tag attributes.
required attribute, 713

validator attribute, 657, 691, 719–720, 722, 758

Validator class, 754–755

Validator implementation, 654, 725

Validator interface, 654, 713, 751, 753, 757–758

validator tag, 723, 725

validators. *See* validators.
writing a backing bean method to perform validation, 757

validator attribute, 691

validator element, 590–591

Validator implementation classes, 654, 712–713

DoubleRangeValidator class, 679, 712

LengthValidator class, 679, 712

LongRangeValidation implementation, 640

LongRangeValidator class, 679, 712, 714

Validator interface, 750–753

Validator tags, 654, 679–680
maximum attribute, 714
minimum, 714
validateDoubleRange tag, 712
validateLength, 712
validateLongRange tag, 640, 712, 714

validator tag, 654, 753

Validators, 632, 634, 645, 664–665, 712–714, 725–726, 750–753
custom validators, 654, 679, 725
standard validators. *See* standard validators.

value attribute, 683

Value binding, 714, 730, 730–739
acceptable types of component values, 731
advantages of, 658
a component instance to a bean property.
See component binding.

a component value to a backing-bean property, 715

a component value to an implicit object, 717

component values and instances to external data sources, 714

value attribute, 639, 642, 683, 685, 688–689, 692–693, 698, 702, 714–716, 730, 768–769

ValueBinding class, 659, 775, 784

value-binding enabling component attributes, 775

value-binding expressions, 657, 715, 718, 732, 775

Value types, 325

Value types, JAX-RPC, 325

Value-binding backing beans, 657

Value-binding expressions, 1397

Value-change events, 652–653, 711, 747
processValueChange(ValueChangeEvent) method, 748, 759
processValueChangeEvent(ValueChangeEvent) method, 759

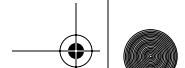
referencing methods that handle value-change events, 657, 722

type attribute, 711

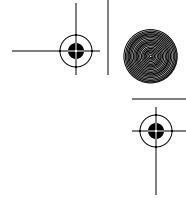
ValueChangeEvent class, 657, 711, 747–748, 758

valueChangeListener attribute, 657, 691, 711, 719–720, 722, 758

valuechangeListener attribute, 763

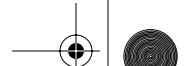
**INDEX****1499**

- V**
`ValueChangeListener` class, 711, 747, 759
`ValueChangeListener` implementation, 748
`valueChangeListener` tag, 678, 710–711, 763
writing a backing bean method to handle value-change events, 758
`ValueChangeEvent`, 748, 758–759
`ValueChangeEvent` methods, 722–723
`ValueChangeListener`, registering, 711
`valueChangeListener` attribute, 691
`ValueChangeListener` class, 748–749
`ValueHolder` interface, 646
`variable` directive, 580–581
`variable` element, 596–598
Variable support tags, 543–544
Variable synchronization, 580–584
Variables, 301
 JSP custom tags, 572–573
 JSP pages, 491–492
 scope, 302
 scripting, 620–621, 629–630
 value, 302
 XSLT, 302
 `--verbose` flag, 25
verifier tool, 26
Verifying. *See also* validating.
 mutual authentication, 1124
 SSL support, 1122
Version, 35
Vertical line (`|`)
 in DTDs, 54
 XPath operator, 253
Vertical lines (`||`), JSP operator, 494
View phase, 665–666
Views, JavaServer Faces technology, 662
Virtual hosts, 1397
- W**
W3C(World Wide Web Consortium), 19, 314, 337, 1349, 1397
.war file extension, 13
- WAR (Web application archive) files, 811
 See also Web applications
 See also Web-tier security
 See also wsdeploy tool
adding files to, 871
adding Web component files, 865
definition, 1397
deploying Web modules, 87
directory structure, 811–812
JavaBeans components in, 86
overview, 13
WarehouseBean example. *See examples*, bean-managed JDBC transactions.
Warnings, 146. *See also* errors.
 definition, 1397
 in DTD, 163
 SAX, 146–147
 XML, 48
Web applications, 86
 See also bookstore example
 See also Coffee Break example
 See also JavaServer Faces
 See also online banking example
accessing data sources, 101
accessing databases from, 100
accessing tag library implementations, 505
configuring, 83, 95–96
databases
 accessing, 100–104
 connection, creating, 103–104
 data sources, creating, 102–103
 data sources, mapping to resource references, 104
DataSource objects, 101
populating, 101–102
resource references, mapping to data sources, 104
resource references, specifying, 103–104
definition, 1397
deployment descriptors, 13, 87
distributable, 1398
errors, mapping to error screens, 99

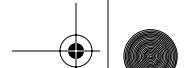


Web applications (*Continued*)
establishing the locale, 821
initialization parameters, setting, 98–99
internationalizing, 819
 J2EE Blueprints, 827
JSP pages, 82
life cycle, 84–86
localization
 character encoding, 824–825
 character sets, 824
 date formats, 823
 Java localization classes, 819–820
 labels, 820–823
 locale, establishing, 821
 messages, 820–823
 number formats, 823
 page encoding, 826
 request encoding, 825–826
 resource bundle, setting, 822
 response encoding, 826–827
 retrieving localized messages, 822–823
 UTF-8 encoding, 825
maintaining state across requests, 464
making tag handlers available to, 599
mapping resource references to data sources, 104
mapping URLs to Web components, 96–97
overview, 82–84
parsing and formatting localized dates and numbers, 823
presentation-oriented, 81
providing localized messages, 820
resource references, declaring, 99–100
retrieving localized messages, 822
running, 91
security. *See* Web-tier security.
service oriented, 81
service-oriented, 81
servlets, 82
 setting the resource bundle, 821
specifying initialization parameters, 98
specifying resource references, 103
specifying welcome files, 97

user interface framework, 24–25
valid partial requests, 97–98
welcome files, declaring, 97–98
Web browsers, 4. *See also* Web clients.
Web clients, 4, 81
 coding, 863–864
 compiling, 865
 context root, specifying, 868
 creating, 863–868
 Duke's Bank, 1318, 1328
 custom tags, 1320
 JavaBeans components, 1319
 JSP template, 1320
 request processing, 1323
 running, 1339
enterprise bean reference, mapping, 867
enterprise bean reference, specifying, 866
examples, 863
online banking example
 client components, 1320–1323
 compiling, 1330
 design strategies, 1319–1320
 overview, 1318–1319
 packaging, 1333–1334
 protecting resources, 1325–1326
 request processing, 1323–1325
 running, 1339
 overview, 4
 packaging, 865
 running, 869–870
Web component developer role, 15
Web components, 6. *See also* J2EE components; JSP; servlets.
accessing databases from, 446
aliases, setting, 96–97
applets bundled with, 6
concurrent access to shared resources, 445
declaring environment entries, 99–100
declaring resource references, 99–100
definition, 1398
encoding of requests delivered to, 825
enterprise bean references, 866
forwarding to other Web components, 462
including other Web resources, 461

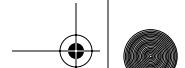
**INDEX****1501**

- invoking other Web resources, 460
- JMS and, 1219
- logging messages, 28
- mapping exceptions to error screens, 99
- mapping filters to, 458
- mapping to URLs, 96–97
- overview, 3, 6
- packaging, 865
- propagating security identity, 1149–1151
- response encoding, 826
- scope objects, 444
- Server Log, overview, 28
- `ServletContext.log` method, 28
- setting the request encoding, 825
- setting the response encoding, 826
- sharing information, 444
- specifying aliases, 96
- specifying initialization parameters, 99
- transactions, 447, 1073
- types, 6
- uses for, 81
- utility classes bundled with, 6
- Web context, 463
- Web container providers, 1398
- Web containers, 10
 - definition, 83, 1398
 - distributed, 1398
 - loading and initializing servlets, 441
 - mapping URLs to Web components, 96
 - overview, 10
- Web content, creating. *See JSP.*
- Web context, accessing, 463–464
- Web deployment descriptors, 13
- Web modules, 13, 86
 - context root, setting, 89–92
 - definition, 86, 1398
 - deployed, listing, 92
 - deploying, 89–92
 - unpackaged, 89, 91–92
 - document root, 86
 - dynamic reloading, 93–95
 - JAR files, 13
 - overview, 13
 - packaging, 88–89
- top-level directory, 86
- undeploying, 95
- updating, 92–95
 - packaged, 93
 - unpackaged, 93
- viewing deployed, 92
- WAR files, 87
- Web pages. *See applets; JSP.*
- Web resource collections, 1094
 - defining, 1093, 1096
 - definition, 1094, 1398
 - editing content, 1096
- Web resources, 86, 1398
 - Duke's Bank, protecting, 1326
 - mapping filters to, 458–460
 - protecting, 1094
 - unprotected, 1094
- Web server providers, 1399
- Web servers, 1398–1399
- Web service clients, 843–844
- Web service endpoint interface, 844, 884–885
- Web services, 10. *See also Coffee Break example.*
 - clients, 326
 - application, 333–336
 - creating, 314–324
 - DII (dynamic invocation interface), 329–333
 - dynamic proxy, 326–329
 - static stub, 321–324
 - unknown until runtime, 329–333
 - definition, 1399
 - EJB. *See enterprise beans, Web services.*
 - endpoint interfaces, 884
 - example, 1255
 - application, creating, 886
 - application, deploying, 888
 - enterprise beans, packaging, 887–888
 - stateless session bean implementation class, 885
 - Web service client, 888–889
 - Web service endpoint interface, 884–885



Web services (*Continued*)
examples, 314
overview, 10–12
RPC (remote procedure calls) support.
See JAX-RPC.
security, 1092
 basic authentication, 1126–1133
 client-certificate authentication, 1133–1142
 mutual authentication, 1133–1142
 overview, 1125–1126
 WSDL files, 886
Web Services Description Language (WSDL), 12, 317–318. *See also XML.*
Web services interoperability (WS-I), 337
Web tier, 2–6
Web-tier security. *See also security.*
 authentication method, setting, 1093, 1095, 1105
 deployment descriptors
 creating, 1092–1100
 viewing, 1092
 JSP pages, adding security to, 1097
 network security requirements, 1093, 1096–1097
 overview, 1092–1093
 passwords, protecting, 1097–1098
 programmatic security methods, 1098–1100
 protecting passwords, 1097–1098
 protecting Web resources, 1094
 request URIs, protected, 1094
 roles
 authorizing, 1093, 1097
 creating, 1097
 mapping, 1090–1092, 1098–1100
 references, declaring, 1098–1100
 references, linking, 1098–1100
 secure connection, specifying, 1097–1098
 security constraints, 1093, 1095
 security requirements, setting with
 deploytool, 1095–1097
 servlets, adding security to, 1097

session management, 1098
SSL support, 1097–1098
unrestricted access, allowing, 1094
URIs, protected, 1094
users
 determining name, 1098
 determining role, 1098
Web resource collections, 1093, 1096
Welcome files, declaring, 97–98
Well formed
 definition, 1399
 JSP documents, 521, 528
tags, 33
 XML, 33, 45–46
when tag, 544, 546
WHERE clause, 1032–1040
Whitespace
 CDATA sections, 51
 compressing, 132–133
 DOM, ignoring, 212
 DTDs, 52
 ignorable, 151–152
tags, 32
 tracking, 151–152
trimming, 289–291
 trimming, JSTL, 561–562
Wildcards, XPath, 251–252
Windows commands
 Application Server, 25, 27
 PointBase database server, 28
Work flows, 833
Work management contract, 1359–1360
World Wide Web Consortium (W3C), 19, 1397
Writing backing bean methods, 755–759
 for handling action events, 757
 for handling value-change events, 758
 for performing navigation, 755
 for performing validation, 757
Writing backing-bean methods, for performing validation, 691
Writing component properties. *See* backing bean properties.
wscompile, 26

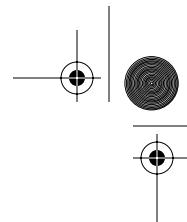
**INDEX****1503**

`wscompile` tool, 26, 315
`wsdeploy`, 26
`wsdeploy` tool, 26
WSDL (Web Services Definition Language), 12, 314, 324, 327, 337
publishing concepts for with JAXR, 423
publishing with JAXR, 408
removing concepts for with JAXR, 424
using to find organizations, 401, 424
WSDL (Web Services Description Language), 12, 317–318. *See also XML.*
WSDL files, 19. *See also wscompile tool.*
WS-I (Web services interoperability), 337

X

X.509 certificates, 1102. *See also digital certificates; security.*
common name field, 1089
definition, 1102–1103
overview, 1089
Xalan, 245, 306
command line transformations, 303
creating a transformer, 259–262
definition, 1399
identity transform, 260
name origin, 245
reading XML file, 258–259
writing a DOM as an XML file, 257–264
XHTML, 44, 1351, 1399
XLink, 1350, 1399
Xlink, 1350
XLL (XML Link Language), 1399
XML (Extensible Markup Language), 11, 31, 313, 324. *See also DTD.*
application processing instructions, 35–36, 46–47
archiving components, 40–41
attributes, 3, 33
binding, 40
case sensitivity, 43
CDATA sections, 51–52
comments, 34, 42

content, 35
converting existing data to. *See SAX.*
creating XML files, 41–42
data
generating, 41–42
identification, 36–37
processing with Java. *See JAXP.*
for data processing, 39
data structure design
attributes *vs.* elements, 75–76
conditionalized DTDs, 78
containers *vs.* contents, 76
data visibility, 76
factoring out DTDs, 78
modularizing DTDs, 78
normalizing data, 77–78
normalizing DTDs, 78
online resources, 74
stylistic choices, 76–77
using existing schemas, 74
declarations, writing, 42
definition, 31–32, 1399–1400
designing a data structure, 74
in document-driven programming, 39–40
documents, 57, 135
documents, and SAAJ, 340
ease of processing, 38
editors, 40
elements
adding attributes, 43
definition, 1373
nesting, 44
root, defining, 42–43
special values, 55
vs. attributes, 75–76
elements in SOAP messages, 340
entities
defining, 35, 49
list of, 49
predefined, 49
in XML documents, 50–51
error handling, 48
errors, definition, 48
fatal errors, 48

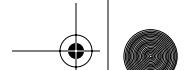


XML (Continued)
generating, 264
hierarchical nature, 38
importance of, 36–38
inline reusability, 37
and JAXP, 19
linkability, 38
linking, 1350
markup, 31
online resources, 40
overview, 11
plain text format, 36
processing instructions, 35–36, 46–47
prolog, 34
prologs, 34–35
reading, 258
registries, establishing security credentials, 404
reserved words, 36
schema standards, 1349
special characters
 character references, 50
 hexadecimal to decimal conversion, 50
 symbols for. *See entities.*
 treating as text, 51
 Unicode values, 50
stylability, 37
syntax, 31–32
tags. *See also* JSP, tag libraries; JSTL.
 attributes, 33
 empty, 33–34
 HTML-style, 44–45
 markup, 31
 nesting, 33, 46
 specifying for a document. *See DTD.*
 structure, transforming to HTML, 280
 well formed, 33
 whitespace, 32
technical committees, 74
transforming to other forms. *See XPath;*
 XSLT.
treating as text, 148–149. *See also* CDATA
 sections; lexical events.
uses for, 38–41

warnings, 48
well formedness, 33, 45–46
whitespace in
 CDATA sections, 51
 DTDs, 52
 tags, 32
XML Base, 1350
XML data, 57, 135
 transforming with XSLT, 278
XML declaration, 531–533
XML documents. *See also* DTD; JSP, documents.
accessing. *See* DOM; SAX.
associating with schemas, 158–159
CDATA sections, 51–52
comments, 34, 42
data, generating, 41–42
data identification, 36–37
declarations, writing, 42
document type, specifying, 56
elements
 adding attributes, 43
 nesting, 44
 root, defining, 42–43
entities
 defining, 35, 49
 list of, 49
 predefined, 49
 in XML documents, 50–51
identifying as documents, 42
JSP documents, 515
locating, 136–137
prologs, 34–35
special characters
 character references, 50
 hexadecimal to decimal conversion, 50
 symbols for. *See entities.*
 treating as text, 51
 Unicode values, 50
 vs. XML data, 57
 well formedness, 33, 45–46
.xml file extension, 12
XML files
 creating, 41–42

**INDEX****1505**

- echoing
 - application skeleton, 118
 - classes, importing, 118
 - ContentHandler**, 119–120
 - I/O, setting up, 119
 - overview, 117
 - parser, setting up, 120–121
- echoing, event handling
 - character events, 125–127
 - document events, 123–124
 - element events, 124–125
- echoing, output
 - spacing, 122–123
 - writing, 121–122
- event handling
 - character events, 125–127
 - document events, 123–124
 - element events, 124–125
- validation, enabling, 816
- XML library, 541–542, 550–554
- XML Link Language (XLL), 1399
- XML namespaces, 523
- XML registries
 - accessing, 394–395. *See also JAXR.*
 - authentication, 404
 - classifications, 406
 - data management, 404–411
 - ebXML Registry and Repository standard, 390
 - objects, listing, 424–425
 - organizations, creating, 404–406
 - querying, 399–400
 - registry providers, 390
 - removing data, 411
 - specifications, 390
 - UDDI (Universal Description, Discovery, and Integration), 390
- XML registries (classifications), 406
- XML Schema, 156–157, 1400. *See also schemas; validating.*
 - definition, 156
 - Instance, 158
 - reason for using DOM, 176, 181
 - SAX error handling, 158
- SAX parser properties, 157
- summary of, 1349
- validating, 237
 - with multiple namespaces, 239
- validating with, in SAX, 156
- XML security. *See also security.*
 - basic authentication example, 1126–1133
 - client-certificate authentication example, 1133–1142
 - mutual authentication example, 1133–1142
 - overview, 1125–1126
- XML standards
 - cxml (Commerce XML), 1354
 - DOM (Document Object Model), 1345
 - dom4j, 1345–1346
 - DrawML (Drawing Meta Language), 1353
 - DTD (document type definition), 1346
 - ebXML (Electronic Business with XML), 1354
 - e-commerce, 1353–1354
 - extended document, 1353
 - ICE (Information and Content Exchange), 1354
 - JDOM, 1345–1346
 - knowledge representation, 1351–1352
 - linking, 1350–1351
 - MathML (Mathematical Markup Language), 1353
 - namespaces, 1347
 - presentation, 1350–1351
 - RDF (Resource Description Framework), 1351–1352
 - RDF Schema, 1352
 - RELAX NG, 1349
 - SAX (Simple API for XML), 1344–1345
 - schemas, 1348–1349, 1352
 - Schematron, 1350
 - SMIL (Synchronized Multimedia Integration Language), 1353
 - SOX (Schema for Object-oriented XML), 1349
 - StAX (Streaming API for XML), 1345



XML standards (*Continued*)
 SVG (Scalable Vector Graphics), 1353
 UBL (Universal Business Language), 1354
 Web site, 74
 XHTML, 1351
 Xlink, 1350
 XML (Extensible Markup Language), 1349
 XML Base, 1350
 +XPath, 1347
 XPointer, 1350–1351
 XSL (Extensible Stylesheet Language), 1347
 XSLT (Extensible Stylesheet Language Transformations), 1347
 XTM (XML topic maps), 1352
XML tags. *See also* JSP, custom tags; JSTL tags; scripting, tags.
 attributes, 33
 blanks. *See* whitespace.
 definition, 1394
 empty, 33–34
 HTML-style, 44–45
 markup, 31
 nesting, 33, 46
 text appearance, transforming to HTML, 280
 well formed, 33
 whitespace, 32
XML topic maps (XTM), 1352
XML-based data interchange. *See* JAXP; JAX-RPC; SAAJ.
XML-based remote procedure calls (RPCs), 19–20. *See also* JAX-RPC.
XML-based standards, 12
 See also ebXML
 See also UDDI
 See also Web services
 See also WSDL
XmlReader interface, 274
XPATH, 1347
XPath, 245–247
 addressing, 249–250, 251, 252

basic addressing, 249
basic expressions, 250
Boolean functions, 256
contexts, 249
conversion functions, 256
data model, 248
data types, 252–253
definition, 246
expression, 247
expressions, 247–248, 250–251
functions, 253–257
namespace functions, 257
node-set functions, 254
numeric functions, 256
operator precedence, 252
operators, 252–253
positional functions, 254
string functions, 255
string values of elements, 253
templates, 249
wildcards, 251–252
+XPath, 1347
XPointer, 247, 1350–1351, 1400
XSL (Extensible Stylesheet Language), 1347, 1400
XSL-FO, 246, 1400
XSLT (Extensible Stylesheet Language Transformations), 245–246, 278, 1347, 1400
concatenating transformations, filter chain, 303
context, 249
data model, 248
definition, 1400
features, 301–302
filter chains, 303–310
Formatting Objects standard, 246
JAXP transformation packages, 246–247
library, 106
overview, 19, 111–112
packages, 112–113
reading XML file, 258–259
running from the command line, 303
templates, 249

INDEX**1507**

- transform, writing, 282
- transformations, concatenating, 303–310
- transforming to XML
 - from arbitrary data, 264–278
 - creating a transformer, 259–262
 - from a DOM, 257–264
 - DOM I/O, 247
 - identity transform, 260
 - sample output, 278
 - SAX I/O, 247
 - stream I/O, 247
- transforming to XML, parser
 - creating, 267–269
 - generating SAX events, 269–275
 - modifying, 269–275
 - as a SAXSource, 275–277
- transforming XML to HTML
 - comments, 295
 - creating a test document, 281–282
 - defining the document type, 279–280
 - generating runtime messages, 286
- headings, 285
- indent options, 290–291
- inline (content) elements, 296–302
- inline tags, 280
- line breaks, 280
- lists and list items, 293
- paragraphs, 292
- printing the HTML, 300
- required tags, 279–280
- structure elements, 283–286, 291–296
- structure tags, 280
- templates in style sheets, 294
- text appearance tags, 280
- trimming whitespace, 289–291
- writing an XSLT transform, 282–283
- writing the program, 287–288
- variables, 302
- XML standard, 1347
- XSL-FO, 246
- XTM (XML topic maps), 1352

