



# Index

- 202 Accepted HTTP success code, 123 (SOAP and WSDL)
- 400 Bad Request error code, 124 (SOAP and WSDL)
- 500 Internal Server Error error code, 124 (SOAP and WSDL)
- 405 Method Not Allowed error code, 124 (SOAP and WSDL)
- 200 OK HTTP success code, 123 (SOAP and WSDL)
- 415 Unsupported Media Type error code, 124 (SOAP and WSDL)
- A**
- A2A (Application-to-Application) communication, 81 (SOAP and WSDL)
- integration, 4 (Overview)
- Abstract base types and schemas, 61–63 (XML)
- Abstract complex types, 63–64 (XML)
- Abstract definitions, 428 (JAX-RPC)
- Abstract Factory Pattern, 354 (JAX-RPC)
- Abstract interface, defining, 142–143 (SOAP and WSDL)
- Accessors, 757–758 (Appndx)
- accessPoint element, 183–184 (UDDI), 552 (JAXR)
- accessPoint UDDI field, 200 (UDDI)
- accessURI property, 550 (JAXR), 552–553 (JAXR), 576 (JAXR)
- Account EJBs, 312 (JAX-RPC)
- actor attribute, 98–102 (SOAP and WSDL), 373 (JAX-RPC), 375–376 (JAX-RPC), 689 (Deployment), 704 (Deployment)
- addAssociation() method, 574 (JAXR)
- addBody() method, 808 (Appndx)
- addChildElement() method, 370 (JAX-RPC), 373 (JAX-RPC)
- addDocument() method, 377 (JAX-RPC)
- addEmailAddress() method, 522 (JAXR)
- addFault() method, 377 (JAX-RPC), 386 (JAX-RPC)
- addHeader() method, 808 (Appndx)
- addMimeType() method, 804 (Appndx)
- addParameter() method, 832–834 (Appndx)
- add\_publisherAssertions operation, 238 (UDDI), 245–246 (UDDI), 600 (JAXR)
- addr element, 761 (Appndx)
- Address Book Markup, 27 (XML)
- Address Book Markup DTD, 740
- Address class, 761 (Appndx)
- address element, 22 (XML), 28 (XML), 50 (XML), 174 (UDDI), 517 (JAXR), 526 (JAXR)
- category attribute, 34 (XML), 743
- default namespace, 29 (XML)
- Address information schema, 28 (XML)
- Address Markup Language, 26, 29 (XML)
- DTDs (Document Type Definitions), 739 (Appndx)
- schema, 27–28 (XML)
- XML instance, 21 (XML)
- Address Markup schema, 73–74 (XML)
- address property, 523 (JAXR)
- Address type, 58–61 (XML), 74 (XML)
- addressLine elements, 174 (UDDI), 525–526 (JAXR)
- addressLine UDDI field, 200 (UDDI)
- addressLines element, 577 (JAXR)
- addTextNode() method, 378 (JAX-RPC)
- addUser() method, 520–521 (JAXR)
- Administrator principal, 676 (Deployment)
- Advanced XML Schema Language, 57–77 (XML)
- all element, 48–49 (XML)
- Amazon.com mailing address, 7 (Overview)
- AND search, 590 (JAXR)
- AND\_ALL\_KEYS constant, 593 (JAXR)
- andAllKeys qualifier, 214 (UDDI)
- Anonymous types, 70–72 (XML)
- ANY data, 34 (XML)
- anyType type, 39 (XML)
- Apache AXIS, 830 (Appndx)
- code generators, 128 (SOAP and WSDL)

- Apache AXIS, (*cont.*)
    - SOAP stacks, 91 (SOAP and WSDL)
  - Apache SOAP, 129 (SOAP and WSDL)
  - appendChild() method, 649 (JAXP)
  - Application server ports, 83 (SOAP and WSDL)
  - application/pdf MIME types, 826 (Appndx)
  - Applications
    - associating file extensions with, 783 (Appndx)
    - exceptions, 467–473 (JAX-RPC)
    - interoperability, 82 (SOAP and WSDL)
    - mapping MIME types, 783 (Appndx)
    - application/xml MIME type, 817 (Appndx), 820–822 (Appndx)
  - ArbitraryXML type, 451 (JAX-RPC)
  - Ariba, 165 (UDDI)
  - Array types, 135 (SOAP and WSDL)
    - names of accessors, 763 (Appndx)
    - RPC/Encoded messaging, 761 (Appndx)
  - Arrays
    - base64 encoding, 766 (Appndx)
    - byte, 766 (Appndx)
    - containing complex types and other arrays, 764–765 (Appndx)
    - mapping XML Schema to Java, 440 (JAX-RPC)
    - multi-dimensional, 764–765 (Appndx)
    - one-dimensional, 765–766 (Appndx)
    - partially transmitted, 766 (Appndx)
    - polymorphic, 763–764 (Appndx)
    - referring to element by position or index, 763 (Appndx)
    - size, 765–766 (Appndx)
    - sparse, 766 (Appndx)
    - standard representation, 761–766 (Appndx)
    - types for RPC/Encoded messaging, 761–766 (Appndx)
    - used as INOUT or OUT parameters, 465–467 (JAX-RPC)
  - arrayType attribute, 135 (SOAP and WSDL), 765–766 (Appndx)
  - Assertions, status of, 255–258 (UDDI)
  - assertionStatusItem element, 256 (UDDI)
  - Association objects
    - collection of, 595–596 (JAXR)
    - creation of, 570–572 (JAXR)
    - finding, 531 (JAXR)
    - instance creation, 574 (JAXR)
    - matching criteria, 596 (JAXR)
    - saving to UDDI registry, 574–575 (JAXR)
  - Association type, 503 (JAXR)
  - Associations, 570–575 (JAXR)
  - AssociationType enumeration, 575–576 (JAXR)
  - AssociationType scheme, 572 (JAXR)
  - AssociationTypeClassificationScheme, 573 (JAXR)
  - Asterisk (\*) wild card character, 675 (Deployment)
  - Asterisk (\*) cardinality symbol, 741 (Appndx)
  - Asterisk (\*) quantifier, 746 (Appndx)
  - Asynchronous messaging
    - processing, 311 (JAX-RPC)
    - responses, 491 (JAXR)
  - Atkinson, Bob, 83 (SOAP and WSDL)
  - AttachmentPart class, 793–803 (Appndx)
  - AttachmentPart objects, 354 (JAX-RPC)
  - Attachments, 773–775 (Appndx)
    - data objects, 795 (Appndx)
    - JAF, 811–812 (Appndx)
    - JPEG image, 795 (Appndx)
    - PDF document, 795 (Appndx)
    - returning Java object representing, 798 (Appndx)
    - SAAJ messages, 783–785 (Appndx)
    - SOAP messages, 783 (Appndx)
  - Attribute methods, 636–637 (JAXP)
  - Attributes, 743 (Appndx)
    - accessing, 636–637 (JAXP)
    - complex types, 43–45 (XML)
    - default value, 47–48 (XML)
    - elements, 22–23 (XML)
    - fixed value, 48 (XML)
    - fully qualified, 86 (SOAP and WSDL)
    - global, 51–52 (XML)
    - header blocks, 375–376 (JAX-RPC)
    - HTTP session, 298–299 (JAX-RPC)
    - multiple pieces of data separated by spaces, 68–70 (XML)
    - names, 23 (XML)
    - name-value pairs, 23 (XML)
    - occurrence constraints, 46–47 (XML)
    - qualified name for, 26 (XML)
    - XML schema-instance, 55 (XML)
  - Attributes interface, 615–616 (JAXP)
  - attributesFormDefault attribute, 52 (XML), 54 (XML)
  - AttributesHandler content handler, 616–618 (JAXP)
  - atts parameter, 615 (JAXP)
  - Authentication
    - BASIC-AUTH (Basic Authentication), 297 (JAX-RPC)
    - Inquiry API, 585–586 (JAXR)
    - Publishing API, 585–586 (JAXR)
    - Symmetric HTTP, 297 (JAX-RPC)
  - Authentication node, 104 (SOAP and WSDL)
  - authenticationMethod property, 483 (JAXR)
  - authInfo element, 259–261 (UDDI)
  - authInfo type, 234 (UDDI)
  - authInfo UDDI field, 200 (UDDI)
  - author element, 768 (Appndx)
  - Author Java beans, 440 (JAX-RPC), 465 (JAX-RPC)
  - Author objects, 767 (Appndx)
  - Author type, 438 (JAX-RPC)
  - Authorization operations, 233 (UDDI)
    - discard\_authToken operation, 235 (UDDI), 237–238 (UDDI)
    - get\_authToken operation, 235–237 (UDDI)
  - authorizedName UDDI field, 200 (UDDI)
  - authorizeName attribute, 260 (UDDI)
  - authors element, 438 (JAX-RPC)
- ## B
- BankManager role, 324 (JAX-RPC)
  - Base64 encoding, 751–753 (Appndx), 780 (Appndx)
    - arrays, 766 (Appndx)

- MIME part, 775 (Appndx)
- SwA messages, 779 (Appndx)
- base64 simple type, 753 (Appndx)
- base64Binary type, 38 (XML)
- B2B (Business-to-Business), 4
  - (Overview), 81 (SOAP and WSDL)
- Bean class
  - defining, 317–319 (JAX-RPC)
  - xmlFragment field, 451 (JAX-RPC)
- Bean instances and method-ready pool, 322 (JAX-RPC)
- Bean-managed transactions, 325 (JAX-RPC)
- begin() method, 308 (JAX-RPC)
- billAddress element, 41 (XML), 43 (XML), 46 (XML), 61–62 (XML)
- Binary data
  - converting to blocks of ASCII characters, 751–753 (Appndx)
  - exchanging with SOAP, 771 (Appndx)
- Binary-to-ASCII encoding standards, 151 (SOAP and WSDL)
- binding element, 129–130 (SOAP and WSDL), 133 (SOAP and WSDL), 142 (SOAP and WSDL), 148 (SOAP and WSDL), 149 (SOAP and WSDL), 152 (SOAP and WSDL), 328 (JAX-RPC), 428 (JAX-RPC), 659–660 (Deployment)
- binding Template data structure, 552 (JAXR)
- bindingKey UDDI field, 200 (UDDI)
- Bindings
  - assigning URL to, 161 (SOAP and WSDL)
  - definition, 341 (JAX-RPC)
  - fault elements, 156–157 (SOAP and WSDL)
  - HTTP, 150–151 (SOAP and WSDL)
  - MIME, 150–151 (SOAP and WSDL)
  - SOAP, 151 (SOAP and WSDL)
  - UDDI registries, 182 (UDDI)
- bindingTemplate data structures, 167 (UDDI), 180, 182–185 (UDDI), 188 (UDDI), 209 (UDDI), 233 (UDDI), 546 (JAXR)
- adding or updating, 242–243 (UDDI)
- deleting, 251–252 (UDDI)
- listing, 225–227 (UDDI), 229–231 (UDDI)
- UUID (Universally Unique Identifier) key, 171 (UDDI)
- bindingTemplates element, 182 (UDDI), 249 (UDDI), 564 (JAXR)
- BMP (bean-managed persistence), 310 (JAX-RPC)
- Body element, 85–86 (SOAP and WSDL), 89 (SOAP and WSDL), 214 (UDDI), 354 (JAX-RPC), 756–657 (Appndx), 834 (Appndx)
- application-specific data, 107 (SOAP and WSDL)
- application-specific elements
  - qualification, 94 (SOAP and WSDL)
  - application-specific elements qualified, 91 (SOAP and WSDL)
- Document/Literal mode, 107–108 (SOAP and WSDL)
- formatted as struct, 108–110 (SOAP and WSDL)
- list of UUID keys, 224 (UDDI)
- modifying contents, 106–107 (SOAP and WSDL)
- representing, 376–377 (JAX-RPC)
- standard hash algorithm, 406 (JAX-RPC)
- VersionMismatch fault, 115 (SOAP and WSDL)
- XML document fragment, 107–108 (SOAP and WSDL)
- XML elements, 88 (SOAP and WSDL)
- Body of SOAP messages, 106–107 (SOAP and WSDL)
- Book and Total schema, 76 (XML)
- Book EJB, 290 (JAX-RPC)
- book element, 46 (XML)
- Book Java bean, 465 (JAX-RPC)
- Book objects, 767 (Appndx)
- Book type, 43 (XML), 76 (XML), 438 (JAX-RPC)
- Book XML schema type, 465 (JAX-RPC)
- BookHolder class, 465 (JAX-RPC)
- BookQuote EJB, 672–673 (Deployment)
- ejb-jar.xml file, 700 (Deployment)
- webservices.xml file, 699 (Deployment)
- BookQuote endpoint, 328 (JAX-RPC)
- BookQuote endpoint interface, 284 (JAX-RPC), 657 (Deployment)
- BookQuote generated stub, 336 (JAX-RPC)
- BookQuote interface, 275 (JAX-RPC), 280 (JAX-RPC), 316–317 (JAX-RPC)
- BookQuote JSE, 290 (JAX-RPC)
- webservices.xml file, 698–699 (Deployment)
- web.xml file, 699 (Deployment)
- BookQuote remote interface, 758 (Appndx)
- BookQuote request message, 355 (JAX-RPC)
- BookQuote RPC/Literal SOAP request message, 127 (SOAP and WSDL)
- BookQuote service endpoint, 108 (SOAP and WSDL)
- BookQuote SOAP message, 121 (SOAP and WSDL)
- BookQuote SOAP request message, 607 (JAXP)
- BookQuote Web service, 274 (JAX-RPC)
- getBookPrice operation, 347 (JAX-RPC)
- invoking with dynamic proxy, 339 (JAX-RPC)
- Java interface definition for, 760 (Appndx), 762 (Appndx)
- SOAP reply message from, 336 (JAX-RPC)
- webservices.xml file, 693–694 (Deployment)
- WSDL definition, 131–132 (SOAP and WSDL)
- WSDL document, 329–330 (JAX-RPC)
- BookQuote WSDL document, 344–345 (JAX-RPC), 695–696 (Deployment)
- BookQuote WSDL tModel, 185–186 (UDDI)
- BookQuoteBean class, 317 (JAX-RPC)
- BookQuoteBean instance, 672 (Deployment)
- BookQuote\_Impl class, 666 (Deployment)
- BookQuote\_Impl\_1 class, 284 (JAX-RPC)

- BookQuoteLiteralPort WSDL port definition, 342 (JAX-RPC)
  - BookQuoteService service interface, 332-333 (JAX-RPC)
  - BookQuoteService.getBookQuotePort() method, 334 (JAX-RPC)
  - BookQuoteServlet\_2 servlet, 334-335 (JAX-RPC)
  - BookQuote.wsdl document, 829 (Appndx)
  - bookquote.wsdl document, 690 (Deployment)
  - Book-type parameter, 438 (JAX-RPC)
  - boolean type, 38 (XML)
  - Box, Don, 83 (SOAP and WSDL), 124 (SOAP and WSDL)
  - BP (Basic Profile) 1.0, 1 (Overview), 4-6 (Overview)
  - BP-Compliant WSDL tModel, 197-198 (UDDI)
  - BP-conformance rules, 6 (Overview)
  - BriefUSAddress element, 60 (XML)
  - BriefUSAddress type, 67 (XML)
  - Brownell, David, 25 (XML)
  - BTP (Business Transaction Protocol), 673 (Deployment)
  - Built-in types, 36-39 (XML)
    - atomic, 64 (XML)
    - pattern facet, 66-67 (XML)
    - restrictive, 64 (XML)
  - BulkBookQuote SOAP method, 759 (Appndx)
  - BulkResponse interface, 496-497 (JAXR)
  - BulkResponse object, 498 (JAXR), 599 (JAXR)
  - BulkResponse type, 496-497 (JAXR)
  - BulkResponse.getExceptions() method, 498 (JAXR)
  - Business classifications, 527 (JAXR)
  - Business objects, 310 (JAX-RPC), 478 (JAXR)
  - businessEntity data structures, 167 (UDDI), 205 (UDDI), 209 (UDDI), 225 (UDDI), 233 (UDDI), 504 (JAXR), 508-509 (JAXR), 511 (JAXR), 521 (JAXR), 591 (JAXR)
    - adding or updating, 239-241 (UDDI)
    - businessEntity element, 171 (UDDI)
    - categorization codes, 176-180 (UDDI)
    - common name of organization, 172 (UDDI)
    - contact information at organization, 173-174 (UDDI)
    - definition of, 169 (UDDI)
    - description of organization, 172-173 (UDDI)
    - listing, 225-227 (UDDI)
    - listing controlled by requester, 261-263 (UDDI)
    - viewing assertions, 255-256 (UDDI)
  - businessEntity elements, 171 (UDDI)
    - deleting, 249-250 (UDDI)
    - finding entries by category, 204-205 (UDDI)
    - Monson-Haefel's, 205-206 (UDDI)
    - UUID (Universally Unique Identifier) key, 171 (UDDI)
  - businessEntity External Link, 510 (JAXR)
  - businessEntity identifiers, 198 (UDDI)
  - businessEntity type, 180 (UDDI), 574 (JAXR)
    - entries by identifier, 206-207 (UDDI)
    - identifier for organization, 174-176 (UDDI)
    - Web address to access, 171-172 (UDDI)
  - businessEntityExt data structures, 225 (UDDI), 227-228 (UDDI)
  - businessEntityExt ExternalLink objects, 510 (JAXR)
  - businessEntityExt type, 171 (UDDI)
  - businessInfos element, 261 (UDDI)
  - businessKey attribute, 171 (UDDI)
  - businessKey UDDI field, 200 (UDDI)
  - BusinessLifeCycleManager interface, 491 (JAXR), 494-495 (JAXR), 498 (JAXR), 599 (JAXR)
  - BusinessLifeCycleManager object, 487 (JAXR)
  - BusinessLifeCycleManager.createPersonName() method, 521 (JAXR)
  - BusinessLifeCycleManager.saveConcepts() method, 559 (JAXR)
  - BusinessLifeCycleManager.saveOrganizations() method, 496 (JAXR)
  - BusinessManager.saveOrganizations() method, 497 (JAXR)
  - BusinessQueryManager interface, 498 (JAXR), 582 (JAXR)
  - BusinessQueryManager object, 490 (JAXR), 530-531 (JAXR)
  - BusinessQueryManager.findConceptByPath() method, 575 (JAXR)
  - BusinessQueryManager.findOrganizations() method, 496-497 (JAXR), 583-586 (JAXR)
  - BusinessQueryManager.findXXX() method, 497 (JAXR), 531 (JAXR)
  - businessService data structures, 167 (UDDI), 180-182 (UDDI), 209 (UDDI), 225 (UDDI), 233 (UDDI), 508 (JAXR), 545 (JAXR), 546 (JAXR)
    - adding or updating, 241-242 (UDDI)
    - definition of, 181 (UDDI)
    - deleting, 250-251 (UDDI)
    - finding entries by tModel, 209 (UDDI)
    - listing, 228-229 (UDDI)
    - UUID (Universally Unique Identifier) key, 171 (UDDI)
  - BusinessService objects, 507 (JAXR)
  - businessServices element, 174 (UDDI)
  - Byte arrays, 766 (Appndx)
  - byte type, 38 (XML)
- ## C
- C#, INOUT and OUT parameters, 454-456 (JAX-RPC), 661 (Deployment)
  - C++, INOUT and OUT parameters, 661 (Deployment)
  - Call interface, 833 (Appndx)
  - Call object, 347 (JAX-RPC), 831 (Appndx), 834 (Appndx)
  - Call.addParameter() method, 833-834 (Appndx)
  - Callback methods, 318 (JAX-RPC)
  - Call.getOutputValues() method, 348 (JAX-RPC)
  - Call.invoke() method, 346 (JAX-RPC), 832-834 (Appndx)

- Call.setProperty() method, 349 (JAX-RPC)
- Call.setTargetEndpointAddress() method, 834 (Appndx)
- CapabilityProfile object, 490 (JAXR)
- CASE\_SENSITIVE\_MATCH constant, 592 (JAXR)
- caseSensitiveMatch qualifier, 212 (UDDI)
- Casting elements, 62–63 (XML)
- CatalogPort interface, 291 (JAX-RPC)
- categorization codes, 176–180 (UDDI)
- categorization tModel type, 191 (UDDI)
- categorization UDDI type, 186 (UDDI)
- category attribute, 22 (XML), 47 (XML), 743
- categoryBag element, 176–180 (UDDI), 182 (UDDI), 189 (UDDI), 193 (UDDI), 198 (UDDI), 205–207 (UDDI), 215 (UDDI), 534–535 (JAXR)
- CCM (Common Component Model), 308 (JAX-RPC)
- CDATA section, 24–25 (XML)
- CDATASection, 648 (JAXP)
- CGI (Common Gateway Interface), 287 (JAX-RPC)
- Character sets and regular expressions, 746 (Appndx)
- Characters, occurring zero or more times, 746–748 (Appndx)
- characters() method, 619–621 (JAXP)
- CharactersHandler content handler, 619 (JAXP), 620 (JAXP)
- Checked classifications, 533 (JAXR)
- checked tModel type, 192–193 (UDDI)
- Child elements, 741–742 (Appndx)
  - header blocks and, 375–376 (JAX-RPC)
- Children, 741–742 (Appndx)
- Children in nodes, 639 (JAXP)
- CIDs (content-ids), 777–778 (Appndx)
- city element, 34 (XML), 39 (XML), 45 (XML), 49 (XML), 59–60 (XML), 742
- Claim header block, 105 (SOAP and WSDL)
- Classification class, 588 (JAXR)
- Classification interface, 534–535 (JAXR)
- Classification objects, 527–538 (JAXR)
- Classification technical-domain type, 12 (Overview)
- Classification type, 503 (JAXR), 564 (JAXR)
- Classifications
  - accessing values, 534–535 (JAXR)
  - businesses, 527 (JAXR)
  - checked, 533 (JAXR)
  - context, 536 (JAXR)
  - country and region, 527 (JAXR)
  - custom, 533–534 (JAXR)
  - external, 535 (JAXR)
  - fixed names, 531–534 (JAXR)
  - incorrect codes, 533 (JAXR)
  - internal, 535–536 (JAXR)
  - ISO 3166, 527 (JAXR)
  - NAICS (North American Industry Classification System), 527 (JAXR)
  - Organization object, 528–530 (JAXR)
  - products and services, 527 (JAXR)
  - root of, 535–536 (JAXR)
  - standard UDDI, 527–534 (JAXR)
  - taxonomy, 527 (JAXR)
  - UNSPSC (Universal Standard Products and Services Classification), 527 (JAXR)
  - UUID, 531–532 (JAXR)
  - WAND, 533 (JAXR)
- classifications
  - criteria, 587–588 (JAXR)
- ClassificationScheme interface, 535–537 (JAXR)
- ClassificationScheme objects, 532–533 (JAXR), 537–538 (JAXR), 562 (JAXR), 575 (JAXR)
- Classification objects, 535 (JAXR)
  - finding, 531 (JAXR)
  - matching criteria, 598 (JAXR)
  - searching for, 587–588 (JAXR)
- ClassificationScheme type, 503 (JAXR), 542 (JAXR)
- Class.newInstance() method, 419 (JAX-RPC)
- Client fault code, 114 (SOAP and WSDL), 120 (SOAP and WSDL), 264 (UDDI)
- Clients, 96 (SOAP and WSDL)
  - initiating communication with Web service, 145–147 (SOAP and WSDL)
  - procedure-call semantics, 144 (SOAP and WSDL)
  - sending messages to Web service without expecting response, 147 (SOAP and WSDL)
- ClientSecurityHandler message handler, 406 (JAX-RPC), 417 (JAX-RPC), 420–421 (JAX-RPC), 685–690 (Deployment)
- Client-side APIs, 11 (Overview)
- Client-side programming models, 277–281 (JAX-RPC)
- cloneNode() method, 638 (JAXP), 641 (JAXP)
- Cloning nodes, 641 (JAXP)
- CML, 19 (XML)
- CMP (container-managed persistence), 309 (JAX-RPC), 310 (JAX-RPC)
- CMP entity beans, 309 (JAX-RPC)
- Code generators and WSDL, 128–129 (SOAP and WSDL)
- Code modules, 91 (SOAP and WSDL)
- Collection object, 498 (JAXR), 522 (JAXR)
- combineCategoryBags qualifier, 213 (UDDI)
- COMBINE\_CLASSIFICATIONS constant, 593 (JAXR)
- comitt() method, 308 (JAX-RPC)
- com.jwsbook.jaxrpc package, 713 (Deployment)
- com.jwsbook.saaj package, 360 (JAX-RPC)
- Command line, space as parameter separator, 489 (JAXR)
- CommandInfo object, 785 (Appndx)
- Command-line tools, 655 (Deployment)
- Comments, 648 (JAXP)
  - literal text contained, 378 (JAX-RPC)
  - XML documents, 23–24 (XML)
- Complex types, 35 (XML)
  - abstract, 63–64 (XML)
  - all element, 48–49 (XML)

- arrays, 764 (Appndx)
- attributes, 43–45 (XML)
- elements nested in, 41 (XML)
- fault messages, 469–470 (JAX-RPC)
- final, 63–64 (XML)
- inheritance, 58–64 (XML)
- instances, 39 (XML)
- local elements, 52 (XML)
- mapping to elements, 42–43 (XML)
- order of elements, 41 (XML)
- RPC/Encoded messaging, 760–761 (Appndx)
- sequence of elements, 48 (XML)
- sequences of elements, 41–43 (XML)
- type of data in elements, 41 (XML)
- complexType element, 59 (XML)
- Components
  - portability, 3 (Overview)
  - service-oriented, 309–310 (JAX-RPC)
- Computers and ports, 83 (SOAP and WSDL)
- Concept information object, 553–564 (JAXR)
- Concept interface, 559–563 (JAXR)
- Concept objects
  - accessing, 569–570 (JAXR)
  - assigning type from UDDI type taxonomy, 558 (JAXR)
  - associating with ServiceBinding object, 564–570 (JAXR)
  - creation of, 553–556 (JAXR)
  - describing, 557 (JAXR)
  - finding, 531 (JAXR)
  - instance creation, 556 (JAXR)
  - matching criteria, 599 (JAXR)
  - methods, 563–564 (JAXR)
  - names, 564 (JAXR)
  - paths for predefined, 573 (JAXR)
  - predefined enumerated, 575 (JAXR)
  - representing association type, 572–574 (JAXR)
  - saving, 559 (JAXR)
  - searching for, 587–589 (JAXR)
  - setting ExternalLink, 557 (JAXR)
  - setting name, 556–557 (JAXR)
  - WS-I Conformance Claims, 558–559 (JAXR)
- Concept type, 503 (JAXR), 542 (JAXR)
- Concurrent Programming in Java: Design Principles and Patterns* (Lea), 302 (JAX-RPC)
- confirmAssociation() method, 600 (JAXR)
- Conformance header block, 105 (SOAP and WSDL)
- Connection object, 417 (JAX-RPC), 479 (JAXR), 484 (JAXR), 486 (JAXR)
- Connection URLs, 481 (JAXR)
- Connection.commit() method, 305 (JAX-RPC)
- ConnectionFactory, 479 (JAXR)
- ConnectionFactory class, 481–483 (JAXR)
- ConnectionFactoryClass system property, 481 (JAXR)
- ConnectionFactory.newInstance() method, 481 (JAXR)
- connectToRegistry() method, 480 (JAXR), 586 (JAXR)
- Constants
  - JAX-RPC API, 349–352 (JAX-RPC)
  - language and country codes, 515 (JAXR)
  - namespace, 351 (JAX-RPC), 379 (JAX-RPC)
  - SOAP 1.1 Encoding namespace, 352 (JAX-RPC)
  - URLs, 350 (JAX-RPC)
  - XML Schema namespace, 352 (JAX-RPC)
  - xsd prefix, 352 (JAX-RPC)
- constructor-parameter-order element, 724 (Deployment)
- Contact business-domain type, 12 (Overview)
- contact elements, 173 (UDDI), 508 (JAXR), 521 (JAXR)
- Contacts, 508 (JAXR)
  - creation of, 520–521 (JAXR)
  - email addresses, 522–523 (JAXR)
  - language-specific descriptions, 521–522 (JAXR)
  - person's name, 521 (JAXR)
  - phone numbers, 523–524 (JAXR)
  - postal addresses, 524–526 (JAXR)
- contacts elements, 173 (UDDI), 516–526 (JAXR)
- Container-managed transactions, 325 (JAX-RPC)
- content handler, 609–611 (JAXP)
- ContentHandler interface, 608–621 (JAXP)
- Content-ID header, 777 (Appndx)
- Content-Id MIME header, 794 (Appndx), 800–801 (Appndx)
- Content-Location headers, 777 (Appndx)
- Content-Location MIME header, 800–801 (Appndx)
- Content-Transfer-Encoding MIME header, 794 (Appndx)
- Content-Type header, 774 (Appndx), 778 (Appndx)
- ContentType MIME header, 803–804 (Appndx)
- context-param elements, 667–668 (Deployment)
- Cookies, 298 (JAX-RPC)
- Copying nodes, 649–651 (JAXP)
- CORBA (Common Object Request Broker Architecture), 82–83 (SOAP and WSDL), 308 (JAX-RPC)
  - accessing RPC components, 310 (JAX-RPC)
  - DII (Dynamic Invocation Interface), 280 (JAX-RPC)
  - interoperability, 3 (Overview)
  - RPC (Remote Procedure Call) components, 309 (JAX-RPC)
- CORBA IIOP protocol, 3 (Overview)
- CORBA Trading Service, 167 (UDDI)
- Country and region classifications, 527 (JAXR)
- country element, 59–60 (XML)
- createAssociation() method, 574 (JAXR)
- createAttachmentPart() method, 795–796
- createConcept() method, 556 (JAXR)
- createDocument() method, 644 (JAXP)
- createExternalIdentifier() method, 541 (JAXR)
- createExternalLink() method, 511 (JAXR)
- createMessage() method, 357–359 (JAX-RPC)
- createName() method, 808–809 (Appndx)
- createObject() method, 526 (JAXR)
- createService() method, 548 (JAXR)

- createSOAPPart() method, 804, 806 (Appndx)
  - createSpecificationLink() method, 568 (JAXR)
  - createUser() method, 520 (JAXR)
  - Crimson parser, 25–26 (XML), 619 (JAXP)
  - Criteria objects, 586 (JAXR)
  - Custom DataContentHandler Factory, 788 (Appndx)
- D**
- data
    - validating, 64 (XML)
    - XML format, 7–9 (Overview)
  - Data objects, adding, 795–798 (Appndx)
  - Data streams, reading and writing, 784 (Appndx)
  - Data structures
    - finding, 531 (JAXR)
    - UDDI, 477 (JAXR)
  - Databases and transactions, 305–308 (JAX-RPC)
  - DataContentHandler class, 785–789 (Appndx), 811–812 (Appndx)
  - DataHandler class, 784 (Appndx), 788 (Appndx)
  - DataHandler parameter, mapping, 827–828 (Appndx)
  - DataHandler type, 825–828 (Appndx)
  - Data-oriented markup languages, 19–20 (XML)
  - DataSource class, 811–812 (Appndx)
  - DataSource interface, 785 (Appndx), 789–792 (Appndx)
  - DataSource object, 416 (JAX-RPC)
  - DataSource type, 825–828 (Appndx)
  - Date object, 453–454 (JAX-RPC)
  - date type, 37 (XML), 39 (XML)
  - DateTime object, 455 (JAX-RPC)
  - dateTime type, 39 (XML)
  - DCE RPC, 82–83 (SOAP and WSDL), 309 (JAX-RPC)
  - DCH (DataContentHandler type), 811–812 (Appndx)
    - class files, 787 (Appndx)
    - delegating to, 788–789 (Appndx)
    - limited to types of Java objects programmed to handle, 789 (Appndx)
    - mapping MIME types to, 786–788 (Appndx)
  - DCOM and RPC (Remote Procedure Call) components, 309 (JAX-RPC)
  - decimal type, 38 (XML)
  - Declarative security attributes, 674–677 (Deployment)
  - Declarative transaction attributes, 672–674 (Deployment)
  - default attribute, 48 (XML)
  - Default namespaces, 29 (XML), 36 (XML), 52 (XML), 54 (XML)
  - DefaultHandler class, 609 (JAXP)
  - DefaultHandler interface, 608–621 (JAXP)
  - Definitions, 133 (SOAP and WSDL)
  - definitions element, 133–134 (SOAP and WSDL)
  - Delete operations, 233 (UDDI), 247 (UDDI)
    - delete\_binding operation, 251–252 (UDDI)
    - delete\_business operation, 249–250 (UDDI)
    - delete\_publisherAssertions operation, 253–254 (UDDI)
    - delete\_service operation, 250–251 (UDDI)
    - delete\_tModel operation, 249 (UDDI), 252–253 (UDDI)
    - dispositionReport element, 248–249 (UDDI)
      - SOAP request and response messages, 248 (UDDI)
  - deleteAssociations() method, 600 (JAXR)
  - delete\_binding operation, 247 (UDDI), 600 (JAXR)
  - delete\_business operation, 247 (UDDI), 249–250 (UDDI), 600 (JAXR)
  - deleteClassificationSchemes() method, 600 (JAXR)
  - deleteConcepts() method, 600 (JAXR)
  - DeleteException type, 496 (JAXR), 498 (JAXR)
  - deleteOrganizations() method, 600 (JAXR)
  - delete\_publisherAssertions operation, 248 (UDDI), 253–254 (UDDI), 600 (JAXR)
  - delete\_service operation, 247 (UDDI), 600 (JAXR)
  - deleteServiceBindings() method, 600 (JAXR)
  - deleteServices() method, 600 (JAXR)
  - delete\_tModel operation, 248–249 (UDDI), 252–253 (UDDI), 600 (JAXR)
  - Deployment descriptors, 319–320 (JAX-RPC), 403 (JAX-RPC), 655–656 (Deployment), 663 (Deployment), 693–694 (Deployment)
    - security roles accessing which endpoint methods, 674 (Deployment)
    - service-qname element, 340 (JAX-RPC)
    - service-ref element, 340 (JAX-RPC), 347 (JAX-RPC)
    - WEB-INF subdirectory, 664 (Deployment)
  - Derived types, 61 (XML), 65 (XML)
  - Derived XML type, 91 (SOAP and WSDL)
  - Descendants, 741
  - description elements, 172–173 (UDDI), 195 (UDDI), 512 (JAXR), 515 (JAXR), 694 (Deployment)
  - description UDDI field, 200 (UDDI)
  - destroy() method, 293–296 (JAX-RPC), 419 (JAX-RPC), 422 (JAX-RPC)
  - detachNode() method, 362 (JAX-RPC), 371 (JAX-RPC), 808 (Appndx)
  - Detail elements, 118 (SOAP and WSDL), 265 (UDDI), 382 (JAX-RPC), 388 (JAX-RPC)
    - describing contents, 137 (SOAP and WSDL)
    - ommitting, 119 (SOAP and WSDL)
  - Detail type, 387 (JAX-RPC)
  - DetailEntry objects, 387 (JAX-RPC)
  - DetailEntry type, 388 (JAX-RPC)
  - Developers and portability of skills, 3 (Overview)
  - Digital signatures, 406 (JAX-RPC), 409 (JAX-RPC)
  - DII (Dynamic Invocation Interface), 11 (Overview), 280–281 (JAX-RPC), 344–352 (JAX-RPC)
  - Document/Literal messaging, 347 (JAX-RPC)

- DII (Dynamic Invocation Interface), (*cont.*)
  - header block information, 395 (JAX-RPC)
  - One-Way messaging, 349 (JAX-RPC)
  - Request/Response messages, 349 (JAX-RPC)
  - RPC/Encoded SOAP 1.1 messaging over HTTP 1.1, 347 (JAX-RPC)
  - RPC/Literal messaging, 347 (JAX-RPC), 349 (JAX-RPC)
  - toolable, 344 (JAX-RPC)
  - without WSDL documents, 349 (JAX-RPC), 829–835 (Appndx)
  - with WSDL documents, 344–349 (JAX-RPC)
- DIME (Direct Internet Message Encapsulation), 771 (Appndx)
- Directory service, accessing, 287 (JAX-RPC)
- discard\_authToken operation, 237–238 (UDDI)
- Discovering visual widgets, 783–792 (Appndx)
- Discovery mechanism, 782–783 (Appndx)
- discoveryURL attribute, 511 (JAXR)
- discoveryURL element, 171–172 (UDDI), 511 (JAXR), 591 (JAXR)
- discoveryURL UDDI field, 200 (UDDI)
- display elements, 685 (Deployment)
- dispositionRecord element, 265 (UDDI), 268 (UDDI)
- dispositionReport element, 248–249 (UDDI)
- dispositionReport type, 234 (UDDI)
- Distributed technologies and RPC-style messaging, 110 (SOAP and WSDL)
- dnb-com:D-U-N-S UDDI standard tModel, 190 (UDDI), 194 (UDDI)
- DNS (Domain Name System), 287 (JAX-RPC)
- DocBook, 19 (XML)
- document message style, 715 (Deployment)
- Document object, 628 (JAXP), 644 (JAXP), 648 (JAXP)
  - Document type, 390 (JAX-RPC)
  - Document type declaration, 739–740 (Appndx)
  - documentation element, 129–131 (SOAP and WSDL)
  - DocumentBuilderFactory factory class, 628 (JAXP)
  - DocumentBuilderFactory.new Instance() method, 628 (JAXP)
  - Document/Encoded messaging mode, 111 (SOAP and WSDL)
  - Document.importNode() method, 391 (JAX-RPC), 649 (JAXP)
  - Document/Literal MEPS (messaging exchange patterns), 110–111 (SOAP and WSDL)
  - Document/Literal mode, 107–108 (SOAP and WSDL)
  - Document/Literal SOAP messages, 201 (UDDI), 214 (UDDI), 347 (JAX-RPC), 443–449 (JAX-RPC)
  - Document-oriented markup languages, 19 (XML)
  - Documents, mapping formats to other documents, 805 (Appndx)
  - Document-style messages, 155–156 (SOAP and WSDL)
  - Document-style SOAP message, 107–108 (SOAP and WSDL)
  - Document-style Web services, 139–140 (SOAP and WSDL)
  - DocumentType type object, 644 (JAXP)
  - doExceptions() method, 497 (JAXR)
  - DOM 2 (Document Object Model, Level 2), 12 (Overview), 25 (XML)
    - Java implementations, 626 (JAXP)
    - parsing with, 627–628 (JAXP)
    - SAAJ 1.2, 390–392 (JAX-RPC)
  - DOM 2 parsers
    - bootstrapping, 627–628 (JAXP)
    - factory classes and wrappers, 26 (XML)
  - DOM (Document Object Model), 25 (XML), 625 (JAXP)
    - accessing XML documents, 628–629 (JAXP)
    - building XML document, 642–645 (JAXP)
    - copying nodes, 649–651 (JAXP)
    - language-neutral specification, 625–626 (JAXP)
    - managing tree, 630–632 (JAXP)
    - moving root element to SOAPMessage object, 392 (JAX-RPC)
    - navigating node tree, 638–640 (JAXP)
    - nodes, 628–641 (JAXP)
    - tree, 625 (JAXP)
      - with comments and CDATA sections, 646–648 (JAXP)
      - creation from XML file, 627–628 (JAXP)
      - versions, 626 (JAXP)
  - DOM documents, building, 641–649 (JAXP)
  - DOM element, importing into SOAP message, 391 (JAX-RPC)
  - DOMImplementation object, 644 (JAXP)
  - dom4j, 26 (XML)
  - DomOutputter class, 628 (JAXP)
  - DOMSource type, 804 (Appndx), 806–807 (Appndx)
  - doPost() method, 296 (JAX-RPC)
  - double type, 38 (XML)
  - ds:Signature header block, 689–690 (Deployment)
  - .dtd extension, 739 (Appndx)
  - DTDs (Document Type Definitions), 27 (XML), 33–34 (XML), 78 (XML), 644 (JAXP)
    - Address Markup Language, 739 (Appndx)
    - cardinality of element's children, 741 (Appndx)
    - declaring attributes, 743 (Appndx)
    - limitations, 743 (Appndx)
    - XML documents, 739 (Appndx)
  - D-U-N-S identification system, 174–176 (UDDI), 196 (UDDI), 538–542 (JAXR)
  - D-U-N-S tModel, 185 (UDDI)
  - duration type, 39 (XML)
  - Dynamic proxies, 280 (JAX-RPC), 718 (Deployment)
  - endpoint interface, 344 (JAX-RPC)
    - generating, 340 (JAX-RPC)
    - generic Service interface, 343 (JAX-RPC)
    - header block information, 395 (JAX-RPC)
  - javax.xml.rpc.Service service interface, 339–340 (JAX-RPC)

- JAX-RPC, 338–344 (JAX-RPC)
  - port definition, 341 (JAX-RPC)
  - service-ref element, 340 (JAX-RPC)
- Dynamic proxy API, 11 (Overview)
- E**
- E\_accountLimitExceeded error code, 266 (UDDI)
- EAI (Enterprise Application Integration), 4 (Overview), 81 (SOAP and WSDL)
- EAR (Enterprise ARchive) file, 656–657 (Deployment)
- E\_assertionNotFound error code, 266 (UDDI)
- E\_authTokenExpired error code, 266 (UDDI)
- E\_authTokenRequired error code, 266 (UDDI)
- E\_busy error code, 266 (UDDI)
- ebXML
  - primary contact, 508 (JAXR)
  - WS-I Basic Profile 1.0, 477 (JAXR)
- ebXML registries and JAXR (Java API for XML Registries), 477, 499 (JAXR)
- ebXML-specific header blocks, 106 (SOAP and WSDL)
- ECCMA (Electronic Commerce Code Management Association) Web site, 178 (UDDI)
- E\_fatalError error code, 266 (UDDI)
- e\_invalidCompletionStatus error code, 266 (UDDI)
- E\_invalidKeyPassed error code, 266 (UDDI)
- E\_invalidProjection error code, 266 (UDDI)
- E\_invalidValue error code, 267 (UDDI)
- EJB container system, 311–314 (JAX-RPC)
- EJB endpoint bean class, 317–319 (JAX-RPC)
- EJB endpoint instance, 323 (JAX-RPC)
- EJB endpoints deployment
  - declarative security attributes, 674–677 (Deployment)
  - declarative transaction attributes, 672–674 (Deployment)
- EJB (Enterprise JavaBeans) 2.1 components, 2 (Overview)
- EJB (Enterprise JavaBeans) endpoints, 11 (Overview), 275 (JAX-RPC), 309 (JAX-RPC)
  - declaring Web service operations supported by, 316 (JAX-RPC)
  - home interface, 276 (JAX-RPC)
  - JDBC usage, 320–321 (JAX-RPC)
  - message handlers, 409–410 (JAX-RPC)
  - naming, 696–697 (Deployment)
  - packaging in JAR file, 319–320 (JAX-RPC)
  - security identity, 675–676 (Deployment)
  - single-threaded, 416 (JAX-RPC)
  - stateless session beans, 276 (JAX-RPC)
- EJB instances, 311 (JAX-RPC)
- EJB JAR file, 656–657 (Deployment)
- ejb subcontext, 289 (JAX-RPC)
- EJB Timer Service, 326 (JAX-RPC)
- EJB Web service, invoking, 318 (JAX-RPC)
- ejbActivate() method, 323 (JAX-RPC)
- EJBContext interface, 323–324 (JAX-RPC)
- ejbCreate() method, 319 (JAX-RPC), 322 (JAX-RPC)
- ejb-jar.xml deployment descriptor, 319 (JAX-RPC), 663 (Deployment), 673 (Deployment), 676 (Deployment)
- ejb-jar.xml file
  - BookQuoteEJB, 700 (Deployment)
  - security attributes, 674 (Deployment)
  - service-endpoint element, 698 (Deployment)
  - service-ref element, 677–679 (Deployment)
  - session-bean definition, 698 (Deployment)
  - transaction attributes, 674 (Deployment)
- ejb-link element, 699–700 (Deployment)
- ejb-name element, 700 (Deployment)
- ejbPassivate() method, 323 (JAX-RPC)
- ejbRemove() method, 322 (JAX-RPC)
- EJBs (Enterprise JavaBeans)
  - accessing with JNDI ENC, 290–291 (JAX-RPC)
  - business modeling capabilities, 309 (JAX-RPC)
  - CMP (container-managed persistence), 309 (JAX-RPC)
  - definition of, 309 (JAX-RPC)
  - EBJ container system, 311–314 (JAX-RPC)
  - history of, 308 (JAX-RPC)
  - managing environment, 311–314 (JAX-RPC)
  - reasons to use, 309 (JAX-RPC)
  - RPC (Remote Procedure Call) components, 309 (JAX-RPC)
  - runtime environment, 320–326 (JAX-RPC)
  - transaction propagation, 312 (JAX-RPC)
  - transactions, 305–308 (JAX-RPC)
  - as Web service endpoints, 275 (JAX-RPC)
  - Web services, 315–326 (JAX-RPC)
- EJB-to-EJB interactions, 673 (Deployment)
- E\_languageError error code, 267 (UDDI)
- element attribute, 140 (SOAP and WSDL)
- Element content data, 34 (XML)
- Element element, 644–645 (JAXP)
- Element object, 371–372 (JAX-RPC), 632 (JAXP)
- Element type, 390 (JAX-RPC), 625 (JAXP)
- ElementCountHandler content handler, 612 (JAXP)
- elementFormDefault attribute, 53 (XML), 91 (SOAP and WSDL)
- ElementHandler content handler, 613 (JAXP)
- ELEMENT\_NODE constant, 633 (JAXP)
- Elements, 21–22 (XML)
  - accessing qnames, 634–636 (JAXP)
  - anonymous types, 70–72 (XML)
  - application-specific, 367–370 (JAX-RPC)
  - attributes, 22–23 (XML), 743
  - avoiding name collisions, 31–32 (XML)
  - casting, 62–63 (XML)
  - CDATA section, 24–25 (XML)

- Elements, (*cont.*)
  - contents of, 740–741 (Appndx)
  - data types, 41 (XML)
  - default namespaces, 29–31 (XML)
  - definitions, 41 (XML)
  - elements nested in, 41 (XML)
  - empty, 22 (XML)
  - end tag, 21 (XML)
  - escape characters, 24 (XML)
  - fully qualified names, 29–30 (XML), 86 (SOAP and WSDL)
  - literal text contained, 378 (JAX-RPC)
  - mapping complex types to, 42–43 (XML)
  - multiple pieces of data separated by spaces, 68–70 (XML)
  - names, 22 (XML)
  - namespace-qualified, 53–55 (XML)
  - navigating hierarchical tree of, 370–372 (JAX-RPC)
  - nested in other elements, 741–742 (Appndx)
  - nillable, 451–452 (JAX-RPC)
  - number of times occurring in instance documents, 45–48 (XML)
  - occurrence constraints, 45–48 (XML)
  - occurring unlimited number of times, 46 (XML)
  - optional, 46 (XML)
  - order of, 41 (XML)
  - qualified name for, 26 (XML)
  - qualified, 52–55 (XML)
  - random order, 48–49 (XML)
  - recycling nodes, 371 (JAX-RPC)
  - removing nodes from tree, 371 (JAX-RPC)
  - restricting, 60–61 (XML)
  - sequences of, 41–43 (XML)
  - start tag, 21 (XML)
  - in text, 24 (XML)
  - in text elements, 24 (XML)
  - unqualified, 52–55 (XML)
  - unqualified local names, 629 (JAXP)
- elementsFormDefault attribute, 52 (XML)
- E-mail
  - embedding non-text data, 772–775 (Appndx)
  - MIME attachments, 773–775 (Appndx)
- Email addresses, 522–523 (JAXR)
  - email element, 523 (JAXR)
  - email UDDI field, 200 (UDDI)
  - EmailAddress interface, 522–523 (JAXR)
  - EmailAddress object, 522–523 (JAXR)
  - E\_messageTooLarge error code, 267 (UDDI)
  - EMPTY data, 34 (XML)
  - Empty-element tags, 22–23 (XML)
  - Encoding style, 107 (SOAP and WSDL)
  - encodingStyle attribute, 155 (SOAP and WSDL)
  - End tag, 17 (XML), 21 (XML)
  - endDocument() method, 612 (JAXP)
  - endElement() method, 605 (JAXP), 613–620 (JAXP)
  - Endpoint interface, 129 (SOAP and WSDL), 274–275 (JAX-RPC), 283–284 (JAX-RPC), 315–317 (JAX-RPC), 327–330 (JAX-RPC), 659–660 (Deployment)
    - definition of, 402 (JAX-RPC)
    - dynamic proxies, 344 (JAX-RPC)
    - exceptions, 467–473 (JAX-RPC)
    - fully qualified name, 697 (Deployment)
    - generated by JAX-RPC compiler, 278 (JAX-RPC)
    - generated from portType element, 429–433 (JAX-RPC), 459 (JAX-RPC)
    - implementation class, 662 (Deployment)
    - implementing, 278 (JAX-RPC)
    - inputs and outputs, 429 (JAX-RPC)
    - Java clients, 316 (JAX-RPC)
    - mapping to service-ref element, 683 (Deployment)
    - name of, 330 (JAX-RPC)
    - one-way operation style, 338 (JAX-RPC)
    - parameterOrder attribute omitted, 459 (JAX-RPC)
  - PurchaseOrder Web service, 444 (JAX-RPC)
  - rules for WSDL-to-Java mapping, 316 (JAX-RPC)
  - supporting INOUT and OUT parameters, 457 (JAX-RPC)
  - WSDL document generated from, 658–660 (Deployment)
  - WSDL operation definition, 328 (JAX-RPC)
  - WSDL portType definition, 328 (JAX-RPC)
- Endpoint methods, 283 (JAX-RPC)
- Endpoints, 11–12 (Overview)
- endPrefixMapping() method, 617–620 (JAXP)
- Enhanced Address DTD, 742
- Enterprise JavaBeans*, Fourth Edition, 314 (JAX-RPC)
- Enterprise messaging systems, 311 (JAX-RPC)
- Entity beans, 309–310 (JAX-RPC)
- enumeration facet, 68–69 (XML)
- Enumerations
  - mapping XML Schema to Java, 441–443 (JAX-RPC)
  - predefined, 573 (JAXR), 575–578 (JAXR)
- Envelope element, 85–86 (SOAP and WSDL), 353–354 (JAX-RPC)
  - declaring namespaces of header blocks, 93 (SOAP and WSDL)
  - namespaces, 89–90 (SOAP and WSDL)
  - not recognizing namespace, 115–116 (SOAP and WSDL)
  - VersionMismatch fault, 115 (SOAP and WSDL)
- Envelope namespace, 350 (JAX-RPC)
- env-entry element, 403 (JAX-RPC)
- Environment variables, accessing from JSEs, 292 (JAX-RPC)
- E\_publisherCancelled error code, 267 (UDDI)
- E\_requestDenied error code, 267 (UDDI)
- E\_requestTimeout error code, 267 (UDDI)
- Error handling, ignoring, 112 (SOAP and WSDL)
- error() method, 622 (JAXP)
- ErrorHandler interface, 622 (JAXP)
- Errors, 379–380 (JAX-RPC), 622 (JAXP)
- Escape characters, 24 (XML)
- E\_secretUnknown error code, 267 (UDDI)
- E\_success error code, 268 (UDDI)
- E\_tooManyOptions error code, 267 (UDDI)

- E\_transferAborted error code, 267 (UDDI)
  - E\_unknownUser error code, 267 (UDDI)
  - E\_unrecognizedVersion error code, 267 (UDDI)
  - E\_unsupported error code, 267 (UDDI)
  - E\_unvalidatable error code, 268 (UDDI)
  - E\_userMismatch error code, 267 (UDDI)
  - E\_valueNotAllowed error code, 268 (UDDI)
  - Events, 12 (Overview)
  - EXACT\_NAME\_MATCH constant, 592 (JAXR)
  - exactNameMatch qualifier, 212 (UDDI)
  - examineHeaderElements() method, 375 (JAX-RPC)
  - example element, 648 (JAXP)
  - Exception type, 468 (JAX-RPC), 470-472 (JAX-RPC)
  - exception-mapping element, 723-725 (Deployment)
  - Exceptions
    - applications, 467-473 (JAX-RPC)
    - endpoint interface, 467-473 (JAX-RPC)
    - JAXR, 498 (JAXR)
    - message handlers, 414-415 (JAX-RPC)
    - UDDI registries, 497 (JAXR)
  - ExtensibleObject interface, 526 (JAXR), 577-578 (JAXR)
  - ExtensibleObject type, 577 (JAXR)
  - extension element, 59 (XML)
  - Extension inheritance, 58-60 (XML)
  - External classifications, 535 (JAXR)
  - External identifiers
    - D-U-N-S identification system, 538-542 (JAXR)
    - Organization objects, 538 (JAXR)
    - taxonomies, 542-543 (JAXR)
    - Thomas Register Supplier Identifier Code system, 538-542 (JAXR)
    - UUID key, 538 (JAXR)
  - External taxonomy, 563 (JAXR)
  - ExternalIdentifier interface, 542-543 (JAXR)
  - ExternalIdentifier object, 538-542 (JAXR), 589 (JAXR)
  - ExternalIdentifier type, 503 (JAXR), 564 (JAXR)
  - externalIdentifiers criteria, 588-589 (JAXR)
  - ExternalLink interface, 511 (JAXR)
  - ExternalLink objects, 509-511 (JAXR)
  - ExternalLink type, 12 (Overview), 503 (JAXR)
  - externalLinks criteria, 590-591 (JAXR)
  - externalLinks property, 509-511 (JAXR)
  - external-schemaLocation property, 624 (JAXP)
  - extractHeaderElements() method, 375 (JAX-RPC)
- ## F
- Factory accessing stub, 278 (JAX-RPC)
  - Fatal errors, 622 (JAXP)
  - fatalError() method, 622 (JAXP)
  - Fault codes
    - accessing as String values or Name objects, 386 (JAX-RPC)
    - dot separator, 114 (SOAP and WSDL)
    - non-standard, 116-117 (SOAP and WSDL)
    - versioning, 113 (SOAP and WSDL)
  - WS-Security specification, 116-117 (SOAP and WSDL)
  - Fault elements, 112-113 (SOAP and WSDL), 115 (SOAP and WSDL), 142 (SOAP and WSDL), 146 (SOAP and WSDL), 156-157 (SOAP and WSDL), 354 (JAX-RPC), 382 (JAX-RPC)
  - Fault messages, 112-113 (SOAP and WSDL)
    - declaring, 140-141 (SOAP and WSDL)
    - defined by WSDL document, 467-468 (JAX-RPC)
    - Exception type generated from, 468 (JAX-RPC)
    - header blocks, 142 (SOAP and WSDL)
    - header block-specific, 159-161 (SOAP and WSDL)
    - including and excluding, 118-119 (SOAP and WSDL)
    - SOAP, 111-120 (SOAP and WSDL)
  - XML Schema complex type, 469-470 (JAX-RPC)
  - Fault type, 471 (JAX-RPC)
  - faultactor element, 118 (SOAP and WSDL), 382 (JAX-RPC)
  - faultcode element, 112-117 (SOAP and WSDL), 382 (JAX-RPC), 618 (JAXP)
  - Faulting node, 118 (SOAP and WSDL)
  - Faults
    - human-readable description, 117 (SOAP and WSDL)
    - identifying, 113-117 (SOAP and WSDL)
    - message definitions to declare, 140-142 (SOAP and WSDL)
    - node causing, 114 (SOAP and WSDL)
    - node generating, 118 (SOAP and WSDL)
    - properly processing, 120 (SOAP and WSDL)
    - WSDL, 467-473 (JAX-RPC)
  - faultstring element, 112 (SOAP and WSDL), 117 (SOAP and WSDL), 382 (JAX-RPC)
  - FaultType type, 470 (JAX-RPC), 472 (JAX-RPC)
  - Faux keys, 503 (JAXR)
  - FederatedConnection objects, 484 (JAXR)
  - FileDataSource class, 791 (Appndx), 795 (Appndx), 812 (Appndx)
  - FileInputStream parameter, 359 (JAX-RPC)
  - Files, building SAAJ object graph, 359 (JAX-RPC)
  - Final complex types, 63-64 (XML)
  - Find operations
    - categoryBag search element, 205-207 (UDDI)
    - definitions, 214-215 (UDDI)
    - Document/Literal SOAP messages, 214 (UDDI)
    - find\_binding operation, 221-223 (UDDI)
    - find\_business operation, 217-218 (UDDI)
    - findQualifiers search element, 210-214 (UDDI)
    - find\_relatedBusinesses operation, 218-220 (UDDI)
    - find\_service operation, 220-221 (UDDI)

- Find operations (*cont.*)
    - find\_tModel operation, 223–224 (UDDI)
    - identifierBag search element, 205–207 (UDDI)
    - Inquiry API, 204–224 (UDDI)
    - name search element, 207–208 (UDDI)
    - payloads, 214–215 (UDDI)
    - qualifier values, 211–214 (UDDI)
    - search elements, 205 (UDDI)
    - searching for matching values, 207 (UDDI)
    - tModel data structures invisible to, 252–253 (UDDI)
    - tModelBag search element, 208 (UDDI)
    - xxxInfos response structures, 215–217 (UDDI)
  - findAssociations() method, 582 (JAXR), 595–596 (JAXR)
  - find\_binding operation, 204 (UDDI), 208 (UDDI), 221–223 (UDDI), 582 (JAXR)
  - find\_business operation, 204–208 (UDDI), 217–218 (UDDI), 582 (JAXR)
  - findCallerAssociations() method, 582 (JAXR), 596 (JAXR)
  - findClassificationSchemeByName() method, 582 (JAXR), 598 (JAXR)
  - findClassificationSchemes() method, 582 (JAXR), 587–588 (JAXR), 598 (JAXR)
  - findConceptByPath() method, 582 (JAXR), 599 (JAXR)
  - findConcepts() method, 582 (JAXR), 587–590 (JAXR), 599 (JAXR)
  - FindException type, 496 (JAXR), 498 (JAXR)
  - findOrganizations() method, 582–592 (JAXR), 597 (JAXR)
  - findQualifier element, 210 (UDDI)
  - findQualifiers criteria, 591–595 (JAXR)
  - findQualifiers element, 205 (UDDI), 207 (UDDI), 210–215 (UDDI)
  - find\_relatedBusiness operation, 204 (UDDI), 582 (JAXR)
  - find\_relatedBusinesses operation, 218–220 (UDDI)
  - find\_service message, 209 (UDDI)
  - find\_service operation, 204–205 (UDDI), 207–208 (UDDI), 220–221 (UDDI), 582 (JAXR)
  - findServiceBindings() method, 582 (JAXR), 587 (JAXR), 590 (JAXR), 598 (JAXR)
  - findServices() method, 582 (JAXR), 587–588 (JAXR), 590 (JAXR), 597 (JAXR)
  - find\_tModel operation, 204–207 (UDDI), 223–224 (UDDI), 582 (JAXR)
  - findXXX() methods, 596–599 (JAXR)
    - FindQualifier constants, 592–595 (JAXR)
    - modifying default behavior, 591–595 (JAXR)
    - search criteria, 586–595 (JAXR)
  - find\_XXX operations, 581–586 (JAXR)
  - Firewalls and SOAP, 124 (SOAP and WSDL)
  - float type, 37–38 (XML), 64–65 (XML)
  - formElementDefault attribute, 54 (XML)
  - fromKey element, 198–199 (UDDI)
  - fromKey UDDI field, 200 (UDDI)
  - Fujitsu, 165 (UDDI)
  - Fully qualified names, 29–30 (XML)
- G**
- General Keyword taxonomy, 180 (UDDI)
  - General-purpose service interface, 681 (Deployment)
  - Generated Holder types, 463–467 (JAX-RPC)
  - Generated stub API, 11 (Overview)
  - Generated stub class, 327 (JAX-RPC), 330 (JAX-RPC)
  - Generated stubs, 718 (Deployment)
  - configured to use message handler, 404–405 (JAX-RPC)
  - custom object types, 279 (JAX-RPC)
  - header block information, 395 (JAX-RPC)
  - holder types, 280 (JAX-RPC)
  - instantiating and pre-configuring, 332 (JAX-RPC)
  - Java clients, 316 (JAX-RPC)
  - J2EE, 332–338 (JAX-RPC)
  - J2EE components, 279 (JAX-RPC), 343 (JAX-RPC)
  - methods with primitive argument types, 279 (JAX-RPC)
  - One-Way messaging, 337 (JAX-RPC)
  - primitive wrappers, 279 (JAX-RPC)
  - reference to, 332 (JAX-RPC), 334 (JAX-RPC)
  - Request/Response operation style, 449 (JAX-RPC)
  - Request/Response Web service, 337 (JAX-RPC)
  - servlets, 333 (JAX-RPC)
  - SOAP attachments, 815 (Appndx)
  - SOAP reply message, 336 (JAX-RPC)
  - standard Java types, 279 (JAX-RPC)
  - XML attachment, 822 (Appndx)
  - generic attribute, 202 (UDDI)
  - Generic Service interface, 343 (JAX-RPC)
  - GenericHandler class, 397 (JAX-RPC)
  - geographical, cultural, or political region, 513–514 (JAXR)
  - GeoWeb 2000 categorization system, 179 (UDDI)
  - Get operations, 233 (UDDI)
    - get\_assertionStatusReport operation, 255–258 (UDDI)
    - get\_bindingDetail operation, 229–231 (UDDI)
    - get\_businessDetail operation, 225–227 (UDDI)
    - get\_businessDetailExt operation, 227–228 (UDDI)
    - get\_publisherAssertions operation, 259–261 (UDDI)
    - get\_registeredInfo operation, 261–263 (UDDI)
    - get\_serviceDetail operation, 228–229 (UDDI)
    - get\_tModelDetail operation, 231–232 (UDDI)
    - SOAP request messages, 224–225 (UDDI)
  - getAccessURI() method, 552 (JAXR)
  - get\_assertionsStatusReport operation, 255–258 (UDDI), 582 (JAXR)
  - getAttribute() method, 301 (JAX-RPC)

- getAttributes() method, 636–637 (JAXP)
- get\_authToken, 234 (UDDI)
- get\_bindingDetail operation, 224–225 (UDDI), 229–231 (UDDI)
- getBody() method, 808 (Appndx)
- GetBookIsbn operation, 142 (SOAP and WSDL)
- getBookPrice element, 364 (JAX–RPC), 367 (JAX–RPC), 809 (Appndx)
- getBookPrice() method, 109 (SOAP and WSDL), 276 (JAX–RPC), 279 (JAX–RPC), 283 (JAX–RPC), 293 (JAX–RPC), 315 (JAX–RPC), 328 (JAX–RPC), 335 (JAX–RPC), 403 (JAX–RPC), 405 (JAX–RPC), 661 (Deployment), 663 (Deployment), 672 (Deployment)
- getBookPrice operations, 142 (SOAP and WSDL), 661 (Deployment), 733 (Deployment), 832 (Appndx)
- getBookPriceFloat() method, 734 (Deployment)
- GetBookPriceRequest message, 134 (SOAP and WSDL), 138 (SOAP and WSDL)
- getBookPriceResponse element, 834 (Appndx)
- GetBookPriceResponse message, 134 (SOAP and WSDL), 138 (SOAP and WSDL)
- getBookPrices() method, 762 (Appndx)
- getBookPriceString() method, 734 (Deployment)
- getBookQuote() method, 673–674 (Deployment)
- getBookQuote operation and SOAP messages, 756–757 (Appndx)
- getBookQuotePort() method, 332 (JAX–RPC)
- getBulkBookPrice operation, 142 (SOAP and WSDL), 348 (JAX–RPC), 757
- getBulkBookPriceResponse message, 138 (SOAP and WSDL)
- getBulkResponse() method, 491 (JAXR)
- get\_businessDetail operation, 224–227 (UDDI)
- get\_businessDetailExt operation, 224 (UDDI), 227–228 (UDDI)
- getBusinessLifeCycleManager() method, 490 (JAXR)
- getBusinessQueryManager() method, 490 (JAXR)
- getCapabilityProfile() method, 490 (JAXR)
- getChildNodes() method, 639 (JAXP)
- getCollection() method, 586 (JAXR)
- getContent() method, 784 (Appndx), 803 (Appndx)
- getContentType() method, 784 (Appndx)
- getContext() method, 301 (JAX–RPC)
- getDataSource() method, 785 (Appndx)
- getDeclarativeQueryManager() method, 491 (JAXR)
- getDescription() method, 551 (JAXR), 564 (JAXR)
- getDocumentElement() method, 639 (JAXP)
- getEJBHome() method, 324 (JAX–RPC)
- getEJBLocalHome() method, 324 (JAX–RPC)
- getEJBLocalObject method, 324 (JAX–RPC)
- getEJBObject() method, 324 (JAX–RPC)
- getEnvelope() method, 364 (JAX–RPC)
- getExceptions() method, 496 (JAXR)
- getFault() method, 377 (JAX–RPC)
- getFaultCodeAsName() method, 386 (JAX–RPC)
- getFaultString() method, 386 (JAX–RPC)
- getFaultStringLocale() method, 386 (JAX–RPC)
- getFirstChild() method, 639 (JAXP)
- getFullName() method, 521 (JAXR)
- getHandlerConfig() method, 420 (JAX–RPC)
- getHeader() method, 808 (Appndx)
- getHeaders() method, 397–399 (JAX–RPC), 420 (JAX–RPC)
- getHttpSession() method, 296 (JAX–RPC), 298 (JAX–RPC)
- getInitParameter() method, 301 (JAX–RPC)
- getInitParameterNames() method, 301 (JAX–RPC)
- getInputStream() method, 784 (Appndx), 790 (Appndx)
- getInvalidIsbn() method, 468 (JAX–RPC)
- getKey() model, 564 (JAXR)
- getLastChild() method, 639 (JAXP)
- getLinkedObjects() method, 511 (JAXR)
- getLocalizedString() method, 515 (JAXR)
- getLocalName() method, 367 (JAX–RPC), 634–636 (JAXP)
- getMajorVersion() method, 301 (JAX–RPC)
- getMessageContext() method, 296 (JAX–RPC), 302 (JAX–RPC)
- getMimeType() method, 301 (JAX–RPC)
- getMinorVersion() method, 301 (JAX–RPC)
- getName() method, 511 (JAXR), 535 (JAXR), 542 (JAXR), 551 (JAXR), 564 (JAXR)
- getNamesDispatcher() method, 301 (JAX–RPC)
- getNamespaceURI() method, 634–636 (JAXP)
- getNextSibling() method, 639 (JAXP)
- getNodeName() method, 632–634 (JAXP)
- getNodeType() method, 632–634 (JAXP)
- getNodeValue() method, 632–634 (JAXP)
- getNumber() method, 523 (JAXR)
- getOutputStream() method, 784 (Appndx), 790 (Appndx)
- getOwnerDocument() method, 638 (JAXP)
- getParent() method, 638 (JAXP)
- getPort() method, 280 (JAX–RPC), 340–341 (JAX–RPC), 343 (JAX–RPC)
- getPortName() method, 725 (Deployment), 727–728 (Deployment)
- getPrefix() method, 367 (JAX–RPC), 634–636 (JAXP)
- getPreviousSibling() method, 639 (JAXP)

- getPrimaryContact() method, 508 (JAXR)
  - getProperty() method, 362 (JAX-RPC)
  - get\_publisherAssertions operation, 255 (UDDI), 259 (UDDI), 582 (JAXR)
  - getQualifiedName() method, 367 (JAX-RPC)
  - getRealPath() method, 301 (JAX-RPC)
  - get\_registeredInfo operation, 255 (UDDI), 261-263 (UDDI)
  - getRegistryObject() method, 531 (JAXR), 590 (JAXR)
  - getRegistryService() method, 494 (JAXR)
  - getResource() method, 301 (JAX-RPC)
  - getResourceAsStream() method, 301 (JAX-RPC)
  - getResourcePaths() method, 301 (JAX-RPC)
  - getRoles() method, 422 (JAX-RPC)
  - get\_serviceDetail operation, 224 (UDDI)
  - get\_services operation, 581 (JAXR)
  - getServletContext() method, 300-301 (JAX-RPC)
  - getServletContextName() method, 301 (JAX-RPC)
  - getServletInfo() method, 301 (JAX-RPC)
  - getSOAPBody() method, 361-362 (JAX-RPC)
  - getSOAPHeader() method, 361-362 (JAX-RPC)
  - getSpecificationObject() method, 569 (JAXR)
  - getStub() method, 335 (JAX-RPC)
  - getTargetBinding() method, 552 (JAXR)
  - get\_tModelDetail message, 252 (UDDI)
  - get\_tModelDetail operation, 224 (UDDI), 231-232 (UDDI)
  - getType() method, 523 (JAXR)
  - getURI() method, 367 (JAX-RPC)
  - getUserPrincipal() method, 296-297 (JAX-RPC)
  - getValue() method, 378 (JAX-RPC), 535 (JAXR), 542 (JAXR)
  - get\_XXX operations, 581-586 (JAXR)
  - GIF MIME parts, 778 (Appndx)
  - GifDataContentHandler DCH, 789 (Appndx)
  - Global attributes, 51-52 (XML)
  - Global elements, 49-52 (XML)
  - GLUE SOAP toolkit, 758 (Appndx)
  - group type, 447 (JAX-RPC)
  - Grouping
    - children, 741-742 (Appndx)
    - operations, 305-308 (JAX-RPC)
    - Web services, 545-553 (JAXR)
  - GUI deployment tools, 655 (Deployment)
- ## H
- handleFault() method, 413 (JAX-RPC), 415 (JAX-RPC)
  - Handler chains, 406-415 (JAX-RPC)
  - handler element, 685-691 (Deployment), 701-706 (Deployment)
  - Handler interface, 411 (JAX-RPC), 422 (JAX-RPC)
  - Handler objects, sharing information, 302 (JAX-RPC)
  - handler-class element, 687 (Deployment)
  - Handler.destroy() method, 422 (JAX-RPC)
  - handleRequest() method, 397 (JAX-RPC), 399-400 (JAX-RPC), 403 (JAX-RPC), 408-410 (JAX-RPC), 412-415 (JAX-RPC), 419 (JAX-RPC)
  - handleResponse() method, 408-410 (JAX-RPC), 412-415 (JAX-RPC)
  - HandlerInfo class, 420 (JAX-RPC)
  - HandlerInfo parameter, 419 (JAX-RPC)
  - HandlerInfo.getHandlerConfig() method, 687 (Deployment), 703 (Deployment)
  - handler-name element, 686 (Deployment), 702 (Deployment)
  - handleXXX() methods, 411-414 (JAX-RPC), 422 (JAX-RPC)
  - hasAttributes() method, 636-637 (JAXP)
  - hasFault() method, 377 (JAX-RPC)
  - Header blocks, 87-88 (SOAP and WSDL)
    - accessing, 373-375 (JAX-RPC)
  - actor, 373 (JAX-RPC)
  - actor attribute, 98-102 (SOAP and WSDL)
    - adding to SOAP messages, 372-375 (JAX-RPC)
    - assigning namespace, 373 (JAX-RPC)
    - attributes, 375-376 (JAX-RPC)
    - changing namespace, 92 (SOAP and WSDL)
    - child elements, 375-376 (JAX-RPC)
    - code module processing, 99 (SOAP and WSDL)
    - creation of isolated, 381-382 (JAX-RPC)
    - declaring namespaces, 93-94 (SOAP and WSDL)
    - delegating creation to Message IdHeader, 380-381 (JAX-RPC)
    - describing contents, 137 (SOAP and WSDL)
    - explicitly identifying, 157-159 (SOAP and WSDL)
    - fully-qualified names, 703-704 (Deployment)
    - Header element, 90 (SOAP and WSDL)
    - identifying nodes to process, 98-102 (SOAP and WSDL)
    - local elements, 94 (SOAP and WSDL)
    - mandatory, 102-105 (SOAP and WSDL)
    - message definitions, 142 (SOAP and WSDL)
    - mustUnderstand attribute, 98 (SOAP and WSDL)
    - namespaces, 90 (SOAP and WSDL)
    - node knowing how to process, 116 (SOAP and WSDL)
    - not understood, 102-103 (SOAP and WSDL)
    - processing mandatory or not, 102-105 (SOAP and WSDL)
    - qualities of service, 106 (SOAP and WSDL)
    - removing, 373-375 (JAX-RPC)
    - role that should process, 373 (JAX-RPC)
    - root element, 373 (JAX-RPC)
    - SOAPElement type, 370 (JAX-RPC)
    - standard, 90 (SOAP and WSDL), 106 (SOAP and WSDL)

- unique ID, 373 (JAX-RPC)
  - versions, 91 (SOAP and WSDL)
  - XML elements, 89–90 (SOAP and WSDL)
  - XML qualified names, 688 (Deployment)
  - Header block-specific fault messages, 159–161 (SOAP and WSDL)
  - Header element, 85–87 (SOAP and WSDL), 89 (SOAP and WSDL), 119 (SOAP and WSDL), 354 (JAX-RPC), 362 (JAX-RPC)
    - declaring XML namespaces, 93–94 (SOAP and WSDL)
    - header blocks, 88 (SOAP and WSDL), 90 (SOAP and WSDL), 372 (JAX-RPC)
    - removing, 371 (JAX-RPC)
    - removing empty, 808 (Appndx)
    - VersionMismatch fault, 115 (SOAP and WSDL)
    - XML elements, 88 (SOAP and WSDL)
  - Header faults, 119 (SOAP and WSDL)
  - Headers and SOAP, 95–106 (SOAP and WSDL)
  - Headers message, 402 (JAX-RPC)
  - Heavyweight JAX-RPC mapping file, 713–716 (Deployment)
  - HelloWorldServlet servlet, 285 (JAX-RPC)
  - Hexadecimal encoding, 780 (Appndx)
  - hexBinary type, 38 (XML)
  - Holder classes
    - INOUT array parameter, 467 (JAX-RPC)
    - INOUT Book parameter, 465 (JAX-RPC)
    - nillable XML Schema built-in types, 462 (JAX-RPC)
    - XML Schema built-in types, 462 (JAX-RPC)
  - Holder interface, 456–467 (JAX-RPC)
  - Holder types
    - generated, 463–467 (JAX-RPC)
    - generated stubs, 280 (JAX-RPC)
    - mapping from WSDL, 457–467 (JAX-RPC)
    - standard, 462–463 (JAX-RPC)
  - Holders, 431 (JAX-RPC), 453 (JAX-RPC), 456–459 (JAX-RPC)
  - Hosting redirectors, 249 (UDDI)
    - hostingRedirector element, 183–184 (UDDI), 553 (JAXR)
    - hostingRedirector UDDI field, 200 (UDDI)
    - href attribute, 767–769 (Appndx)
    - HTML and node element, 24–25 (XML)
    - HTTP 1.1, 338 (JAX-RPC)
    - HTTP BASIC-AUTH (Basic Authentication), 297 (JAX-RPC), 324 (JAX-RPC)
    - HTTP (HyperText Transfer Protocol), 120 (SOAP and WSDL)
      - accessing servers and clients behind firewalls, 124 (SOAP and WSDL)
      - bindings, 150–151 (SOAP and WSDL)
      - client error when transmitting message, 123–124 (SOAP and WSDL)
      - Content-Type header, 778 (Appndx)
      - GET messages, 121 (SOAP and WSDL)
      - J2EE Web Services, 152 (SOAP and WSDL)
      - POST messages, 121–123 (SOAP and WSDL)
      - POST request, 121 (SOAP and WSDL), 202 (UDDI)
      - requesting web pages, 121 (SOAP and WSDL)
      - security, 124 (SOAP and WSDL)
      - SOAP messages, 81–82 (SOAP and WSDL)
      - SOAP requests, 123 (SOAP and WSDL)
    - HTTP reply message, 121 (SOAP and WSDL)
    - HTTP requests, 120–124 (SOAP and WSDL)
    - HTTP response codes, 123–124 (SOAP and WSDL)
    - HTTP sessions, 298–299 (JAX-RPC)
    - HTTP tunneling, 83 (SOAP and WSDL)
    - HTTPS (HTTP 1.1 over SSL (Secure Sockets Layer)), 152 (SOAP and WSDL), 233 (UDDI)
    - HttpServletRequest parameter, 296 (JAX-RPC)
    - HttpSession object, 296 (JAX-RPC), 298–300 (JAX-RPC)
    - URLConnection class, 791 (Appndx)
  - URLConnection.getOutputStream() method, 791 (Appndx)
    - http://www.Monson-Haefel.com/jwsbook/ADDR namespace, 30–31 (XML)
    - http://www.Monson-Haefel.com/jwsbook/PO namespace, 31 (XML)
    - http://www.Monson-Haefel.com/jwsbook/PurchaseOrder namespace, 30 (XML)
    - http://www.Monson-Haefel.com/logger role, 409 (JAX-RPC)
    - http://www.23.org/2001/XMLSchema XML schema namespace, 37 (XML)
- ## I
- IBM, 165 (UDDI), 166 (UDDI), 478 (JAXR)
  - IBM test registry Web site, 478 (JAXR)
  - IBM WebSphere code generators, 128 (SOAP and WSDL)
  - id attribute, 767 (Appndx), 769 (Appndx)
  - identifier tModel type, 191 (UDDI)
  - identifier UDDI type, 186 (UDDI)
  - Identifier value, 542 (JAXR)
  - identifierBag element, 174–176 (UDDI), 189 (UDDI), 193 (UDDI), 197 (UDDI), 205–207 (UDDI), 215 (UDDI), 542 (JAXR)
  - Identity relationships, 573 (JAXR)
  - identityBag element, 535 (JAXR)
  - IETF (Internet Engineering Task Force), 28 (XML)
  - ignorableWhiteSpace() method, 621 (JAXP)
  - IIOP (Internet Inter-ORB Protocol), 82–83 (SOAP and WSDL), 310–311 (JAX-RPC)
  - IllegalArgumentException exception, 804 (Appndx)
  - Image object, 783 (Appndx), 795 (Appndx), 812 (Appndx)
  - image/gif MIME type, 817 (Appndx), 818 (Appndx)
  - image/jpeg MIME type, 817 (Appndx), 818 (Appndx)
  - Implementation class, 274–275 (JAX-RPC), 283–284 (JAX-RPC)

- Implementation definitions, 428 (JAX-RPC)
- import element, 72-77 (XML), 129-130 (SOAP and WSDL), 136-137 (SOAP and WSDL)
- import statement, 445 (JAX-RPC)
- Importing
  - DOM element into SAAJ 1.2 SOAPMessage, 391 (JAX-RPC)
  - schemas, 72-75 (XML)
  - WSDL document namespaces, 136-137 (SOAP and WSDL)
- importNode() method, 650-651 (JAXP)
- ImsCatalogService interface, 291 (JAX-RPC)
- IN parameters, 453 (JAX-RPC), 661 (Deployment)
- include element, 72 (XML), 75-77 (XML)
- Including schemas, 75 (XML)
- indent variable, 614-615 (JAXP)
- Information Model, 477 (JAXR)
- Information objects
  - adding to UDDI registry, 495 (JAXR)
  - instance creation, 491-494 (JAXR)
  - saving to UDDI registries, 492 (JAXR)
  - updating, 510 (JAXR)
- Inheritance
  - complex types, 58-64 (XML)
  - restriction, 60-61 (XML)
  - simple types, 64-68 (XML)
- init() method, 293-296 (JAX-RPC), 419 (JAX-RPC)
- Initial sender, 95-96 (SOAP and WSDL)
- InitialContext object, 288-289 (JAX-RPC), 293 (JAX-RPC), 333 (JAX-RPC)
- init-param elements, 687 (Deployment), 702-703 (Deployment)
- In-memory instances of information objects, 491 (JAXR)
- INOUT parameter mode, 280 (JAX-RPC)
- INOUT parameters, 144 (SOAP and WSDL), 431-432 (JAX-RPC), 459 (JAX-RPC), 823-825 (Appndx)
  - C#, 454 (JAX-RPC)
  - JAX-RPC, 456-457 (JAX-RPC)
  - JAX-RPC compiler, 458 (JAX-RPC)
  - pass-by-reference, 455 (JAX-RPC)
- input element, 133 (SOAP and WSDL), 142 (SOAP and WSDL), 146 (SOAP and WSDL), 157 (SOAP and WSDL)
- input messages, 143-145 (SOAP and WSDL), 147 (SOAP and WSDL), 435 (JAX-RPC), 457-458 (JAX-RPC)
- InputStream parameter, 358 (JAX-RPC)
- Inquiry API, 201 (UDDI)
  - accessing, 203 (UDDI)
  - authentication, 585-586 (JAXR)
  - find operations, 204-224 (UDDI)
  - querying UDDI registry, 204-224 (UDDI)
- Inquiry operation, 481-482 (JAXR)
- insertBefore() method, 648-649 (JAXP)
- instance documents
  - number of times element occurs in, 45-48 (XML)
  - type of element, 62 (XML)
- Instance variables and message handlers, 416-417 (JAX-RPC)
- instanceDetails elements, 185 (UDDI), 564 (JAXR), 569-570 (JAXR)
- instanceParms UDDI field, 200 (UDDI)
- int element, 763 (Appndx)
- int type, 38 (XML)
- integer built-in type, 37 (XML)
- integer type, 38 (XML)
- Interfaces
  - servlet container system, 300 (JAX-RPC)
  - Web service endpoints, 278 (JAX-RPC)
- Internal classifications, 535-536 (JAXR)
- Internal taxonomy, 560-563 (JAXR)
- InternationalJSE\_Impl type, 299 (JAX-RPC)
- InternationalString interface, 512-513 (JAXR)
- InternationalString objects, 514-516 (JAXR), 557 (JAXR), 564 (JAXR)
- InternationalString type, 512 (JAXR), 521 (JAXR)
- Internet
  - protocol used to transport SOAP messages, 151-152 (SOAP and WSDL)
  - schemas, 57 (XML)
- Interoperability
  - applications, 82 (SOAP and WSDL)
  - BP (Basic Profile) 1.0, 5-6 (Overview)
  - CORBA, 3 (Overview)
  - JE22 servers, 1 (Overview)
  - programmers, 4 (Overview)
  - SOAP (Simple Object Access Protocol), 7-9 (Overview)
  - Web services platforms, 1 (Overview)
  - WSDL (Web Services Description Language), 9 (Overview)
  - XML, 57 (XML)
- InvalidIsbnException exception, 663 (Deployment)
- InvalidIsbnFault exception class, 468 (JAX-RPC), 713 (Deployment)
- InvalidIsbnFault type, 468 (JAX-RPC), 663 (Deployment)
- InvalidIsbnFaultDetail element, 141 (SOAP and WSDL)
- InvalidIsbnType type, 470 (JAX-RPC), 472 (JAX-RPC)
- Invoice type, 35 (XML)
- invoke() method, 347-348 (JAX-RPC), 832 (Appndx), 834-835 (Appndx)
- invokeOneWay() method, 349 (JAX-RPC)
- isbn element, 364 (JAX-RPC), 367 (JAX-RPC), 621 (JAXP), 644-645 (JAXP), 809
- ISBN (International Standard Book Number), 109 (SOAP and WSDL)
  - regular expressions example, 748-749 (Appndx)
- isbn parameter, 834 (Appndx)
- ISBN type, 135 (SOAP and WSDL)
- isCallerInRole() method, 324 (JAX-RPC)
- isComment() method, 378 (JAX-RPC)
- ISEC (Integrated Shipbuilding Environment Consortium), 166 (UDDI)
- ISO 3166, 178 (UDDI), 527 (JAXR), 532 (JAXR), 559-560 (JAXR)

- ISO 3166 value, 206 (UDDI)
  - isPartialResponse() method, 497 (JAXR)
  - isReplacedBy UDDI identifier, 197 (UDDI)
  - isSupported() method, 641 (JAXP)
  - isUserRole() method, 297 (JAX-RPC)
- J**
- JAF (Java Activation Framework), 782–784 (Appndx)
    - attaching resource derived from file or Web server, 789–792 (Appndx)
    - attachments, 811–812 (Appndx)
    - CommandInfo object, 785 (Appndx)
    - DataHandler class, 783–785 (Appndx)
    - javax.activation.DataHandler class, 783–785 (Appndx)
    - mailcap file, 786–788 (Appndx)
    - MIME type registry, 791–792 (Appndx)
    - mimetypes.default file, 792 (Appndx)
    - SAAJ, 793–803 (Appndx)
  - JAR file, 787 (Appndx)
  - JAR (Java ARchive) files, 655 (Deployment)
    - EJB JAR file, 656–657 (Deployment)
    - meta-data about, 664 (Deployment)
    - packaging EJB endpoints in, 319–320 (JAX-RPC)
    - RAR (Resource ARchive) file, 656–657 (Deployment)
    - referring to port component in, 684–685 (Deployment)
    - WAR (Web ARchive) file, 656–657 (Deployment)
  - Java
    - communicating with non-Java platforms, 273 (JAX-RPC)
    - interface definition for
      - BookQuote Web Service, 760 (Appndx), 762 (Appndx)
    - java.lang.Object type, 186 (UDDI)
    - mapping
      - MIME types to, 816–825 (Appndx)
      - to WSDL, 659 (Deployment)
      - from WSDL and XML to, 281 (JAX-RPC)
      - WSDL to, 428 (JAX-RPC)
    - XML Schema to, 434–452 (JAX-RPC)
    - methods returning only single value, 661 (Deployment)
    - packages, 26 (XML), 718 (Deployment)
    - IN parameters, 661 (Deployment)
    - pass-by-copy, 453–454 (JAX-RPC)
    - polymorphism, 764 (Appndx)
    - primitive wrapper types mapping XML Schema nillable built-in types to, 452 (JAX-RPC)
    - SAAJ (SOAP with Attachments API for Java), 354 (JAX-RPC)
    - SwA (SOAP Messages with Attachments), 353 (JAX-RPC)
    - threading, 302 (JAX-RPC)
    - Java Activation Framework, 281 (JAX-RPC)
    - Java API for UDDI, 203 (UDDI)
    - Java API for Web services, 273 (JAX-RPC)
    - Java classes
      - definitions, 41 (XML)
      - fields, 39 (XML)
      - generated for USState enumeration type, 442 (JAX-RPC)
    - Java clients, 316 (JAX-RPC)
    - Java endpoint interfaces, 281 (JAX-RPC)
    - Java interfaces, 143 (SOAP and WSDL), 728 (Deployment)
    - Java Networking package, 485 (JAXR)
    - Java objects, 309 (JAX-RPC)
      - converting to and from data stream, 785–789 (Appndx)
      - DCH (DataContentHandler type), 786 (Appndx)
    - Java Reflection API, 280 (JAX-RPC)
    - Java RMI interface, 129 (SOAP and WSDL)
    - Java RMI over SOAP, 10–11 (Overview)
    - Java RMI-IIOP, 275 (JAX-RPC)
      - accessing EJB, 310 (JAX-RPC)
    - remote interfaces, 315 (JAX-RPC)
    - Java Servlet 2.4 specification, 669 (Deployment)
    - Java Servlets 2.4 components, 2 (Overview)
    - java.awt.Image file, 812 (Appndx)
    - java.awt.Image object, 825 (Appndx)
    - java.awt.Image type, 817–818 (Appndx), 825 (Appndx)
    - java.awt.image.BufferedImage object, 798 (Appndx)
    - JavaBeans class
      - generated from XML Schema Book type, 438 (JAX-RPC), 440 (JAX-RPC)
    - java:comp/env/ namespace, 680 (Deployment)
    - java.ejb.EJBObject interface, 315 (JAX-RPC)
    - java.home/lib directory, 787 (Appndx)
    - java.io.File objects, 822 (Appndx)
    - java.io.InputStream, 791 (Appndx)
    - java.io.OutputStream, 791 (Appndx)
    - java.io.InputStream object, 822 (Appndx)
    - java.io.InputStream type, 805 (Appndx)
    - java.io.Reader object, 822 (Appndx)
    - java.io.Reader type, 805 (Appndx)
    - java.lang.Exception exception, 468 (JAX-RPC)
    - java.lang.IllegalStateException exception, 324 (JAX-RPC), 372 (JAX-RPC)
    - java.lang.Object type, 186 (UDDI)
    - java.lang.reflect package, 344 (JAX-RPC)
    - java.lang.reflect.InvocationHandler interface, 344 (JAX-RPC)
    - java.lang.reflect.Proxy class, 344 (JAX-RPC)
    - java.lang.RuntimeException exception, 325 (JAX-RPC), 399 (JAX-RPC)
    - java.lang.String type, 436 (JAX-RPC), 732 (Deployment), 817 (Appndx)
    - java.lang.System class, 607 (JAXP)
    - java.lang.System.setProperty() method, 481 (JAXR)
    - JavaMail API, 2 (Overview)
      - MimeMultipart class, 798 (Appndx)
      - MimeMultipart type, 819 (Appndx)
    - JavaMail Session object, 289–290 (JAX-RPC)

- java-method-name element, 731 (Deployment)
- java.net, 485 (JAXR)
- java.net.HttpURLConnection, 791 (Appndx)
- java.net.JarURLConnection, 791 (Appndx)
- java.rmi.dgc.VMID() method, 373 (JAX-RPC), 381 (JAX-RPC), 399 (JAX-RPC)
- java.rmi.Remote interface, 284 (JAX-RPC), 315 (JAX-RPC), 327 (JAX-RPC), 429 (JAX-RPC)
- java.rmi.RemoteException exception, 316 (JAX-RPC), 318 (JAX-RPC), 415 (JAX-RPC), 429 (JAX-RPC)
- java.rmi.RemoteException type, 284 (JAX-RPC), 467 (JAX-RPC)
- java.security.KeyPair, 417 (JAX-RPC)
- java.security.Principal object, 297 (JAX-RPC), 675 (Deployment)
- java.sql.Connection, 419 (JAX-RPC)
- java.util.Locale object, 386 (JAX-RPC), 512-513 (JAXR)
- java.util.Locale type, 515 (JAXR)
- java.util.Map object, 420 (JAX-RPC), 687 (Deployment), 703 (Deployment)
- java-wsdl-mapping element, 717 (Deployment)
- javax.activation.DataContentHandler class, 811-812 (Appndx)
- javax.activation.DataHandler class, 783-785 (Appndx)
- javax.activation.DataSource class, 811-812 (Appndx)
- javax.activation.DataSource interface, 789-792 (Appndx)
- javax.activation.FileDataSource object, 790 (Appndx)
- javax.activation.URLDataSource object, 790 (Appndx)
- javax.ejb.EJBContext interface, 323-324 (JAX-RPC)
- javax.ejb.EJBException exception, 325 (JAX-RPC)
- javax.ejb.EJBLocalObject interface, 315 (JAX-RPC)
- javax.ejb.EJBObject interface, 315 (JAX-RPC)
- javax.ejb.Remote interface, 275 (JAX-RPC)
- javax.ejb.SessionBean interface, 318 (JAX-RPC), 321-323 (JAX-RPC)
- javax.mail.internet.MimeMultipart class, 818-820 (Appndx)
- javax.mail.internet.MimeMultipart type, 817 (Appndx)
- java.xml.registry.infomodel.Service objects, 508 (JAXR)
- java.xml.registry.infomodel.User objects, 516-526 (JAXR)
- java-xml-type-mapping element, 720-723 (Deployment)
- javax.naming.InitialContext object, 333 (JAX-RPC), 419 (JAX-RPC)
- javax.rmi.Remote interface, 315 (JAX-RPC)
- javax.security.auth.x500.X500PrivateKey class, 485 (JAXR)
- javax.security.Principal object, 324-325 (JAX-RPC)
- javax.Servlet.http.HttpSession object, 298 (JAX-RPC)
- javax.Servlet.SingleThreadModel interface, 303 (JAX-RPC)
- javax.sql.DataSource object, 417 (JAX-RPC), 419 (JAX-RPC)
- javax.transaction.UserTransaction object, 325 (JAX-RPC)
- javax.transform.Source object, 825 (Appndx)
- javax.xml.namespace package, 343 (JAX-RPC)
- javax.xml.namespace.QName objects, 347 (JAX-RPC)
- javax.xml.parsers.DocumentBuilder class, 627 (JAXP)
- javax.xml.parsers.DocumentBuilderFactory class, 627 (JAXP)
- javax.xml.registry.BulkResponse interface, 496-497 (JAXR)
- javax.xml.registry.BusinessLifeCycleManager interface, 494-495 (JAXR)
- javax.xml.registry.FindException types, 497 (JAXR)
- javax.xml.registry.infomodel, 477 (JAXR)
- javax.xml.registry.infomodel.ClassificationScheme interface, 535-537 (JAXR)
- javax.xml.registry.infomodel.Concept interface, 559-560 (JAXR)
- javax.xml.registry.infomodel.EmailAddress interface, 522-523 (JAXR)
- javax.xml.registry.infomodel.ExtensibleObject interface, 577 (JAXR)
- javax.xml.registry.infomodel.ExternalIdentifier interface, 542-543 (JAXR)
- javax.xml.registry.infomodel.ExternalLink interface, 511 (JAXR)
- javax.xml.registry.infomodel.InternationalString interface, 512-513 (JAXR)
- javax.xml.registry.infomodel.Key interface, 504 (JAXR)
- javax.xml.registry.infomodel.Key objects, 599 (JAXR)
- javax.xml.registry.infomodel.LocalizedString interface, 513-514 (JAXR)
- javax.xml.registry.infomodel.Organization interface, 507-508 (JAXR)
- javax.xml.registry.infomodel.RegistryObject interface, 501-504 (JAXR)
- javax.xml.registry.infomodel.Service interface, 550-551 (JAXR)
- javax.xml.registry.infomodel.ServiceBinding interface, 551-553 (JAXR)
- javax.xml.registry.infomodel.Slot interface, 578 (JAXR)
- javax.xml.registry.infomodel.SpecificationLink interface, 569-570 (JAXR)
- javax.xml.registry.infomodel.TelephoneNumber interface, 523-524 (JAXR)
- javax.xml.registry.infomodel.User information objects, 508 (JAXR)
- javax.xml.registry.infomodel.User interface, 516-520 (JAXR)
- javax.xml.registry.InvalidRequestException exception, 511 (JAXR), 598 (JAXR)
- javax.xml.registry.LifecycleManager interface, 491-494 (JAXR)
- javax.xml.registry.RegistryException type, 498 (JAXR)

- javax.xml.registry.RegistryService interface, 490 (JAXR)
- javax.xml.registry.SaveException exception, 533 (JAXR)
- javax.xml.registry.SaveException types, 497 (JAXR)
- javax.xml.registry.UnsupportedCapabilityException exception, 521 (JAXR)
- javax.xml.rpc.Call interface, 346 (JAX-RPC), 349 (JAX-RPC)
- javax.xml.rpc.encoding.XMLType class, 350 (JAX-RPC), 833 (Appndx)
- javax.xml.rpc.handler.GenericHandler, 397 (JAX-RPC)
- javax.xml.rpc.handler.Handler interface, 396–397 (JAX-RPC), 411–414 (JAX-RPC), 702 (Deployment)
- javax.xml.rpc.handler.HandlerInfo class, 420 (JAX-RPC)
- javax.xml.rpc.handler.MessageContext interface, 400 (JAX-RPC)
- javax.xml.rpc.handler.MessageContext object, 302 (JAX-RPC)
- javax.xml.rpc.holders.Holder interface, 453 (JAX-RPC), 456–467 (JAX-RPC)
- javax.xml.rpc.holders.Holder types, 434 (JAX-RPC)
- javax.xml.rpc.holders.IntHolder class, 463 (JAX-RPC)
- javax.xml.rpc.holders.IntHolder type, 458 (JAX-RPC)
- javax.xml.rpc.JAXRPCException exception, 349 (JAX-RPC), 399 (JAX-RPC)
- javax.xml.rpc.JAXRPCException types, 419 (JAX-RPC)
- javax.xml.rpc.NamespaceConstants class, 833 (Appndx)
- javax.xml.rpc.NamespaceConstants type, 350 (JAX-RPC)
- javax.xml.rpc.server.ServiceLifecycle interface, 293–302 (JAX-RPC)
- javax.xml.rpc.server.ServletEndpointContext interface, 296 (JAX-RPC)
- javax.xml.rpc.Service interface, 332 (JAX-RPC), 340 (JAX-RPC), 343 (JAX-RPC), 681 (Deployment)
- javax.xml.rpc.Service object, 346 (JAX-RPC)
- javax.xml.rpc.Service service interface, 339–340 (JAX-RPC)
- javax.xml.rpc.Stub interface, 331 (JAX-RPC)
- javax.xml.soap.CHARACTER\_SET\_ENCODING property, 362 (JAX-RPC)
- javax.xml.soap.Detail interface, 387 (JAX-RPC)
- javax.xml.soap.DetailEntry interface, 388 (JAX-RPC)
- javax.xml.SOAPHeader interface, 374 (JAX-RPC)
- javax.xml.soap.MessageFactory class, 357–360 (JAX-RPC)
- javax.xml.soap.Name interface, 366 (JAX-RPC)
- javax.xml.soap.Node interface, 371 (JAX-RPC)
- javax.xml.soap.SOAPBody interface, 376 (JAX-RPC)
- javax.xml.soap.SOAPBodyElement interface, 377 (JAX-RPC)
- javax.xml.soap.SOAPElement interface, 368 (JAX-RPC)
- javax.xml.soap.SOAPException class, 379–380 (JAX-RPC)
- javax.xml.soap.SOAPFactory class, 380 (JAX-RPC)
- javax.xml.soap.SOAPFault interface, 383 (JAX-RPC)
- javax.xml.soap.SOAPFaultElement interface, 387 (JAX-RPC)
- javax.xml.soap.SOAPHeaderElement interface, 375 (JAX-RPC)
- javax.xml.soap.Text interface, 378 (JAX-RPC)
- javax.xml.soap.WRITE\_XML\_DECLARATION property, 362 (JAX-RPC)
- javax.xml.transform.Source interface, 821 (Appndx)
- javax.xml.transform.Source type, 803–805 (Appndx), 817 (Appndx)
- JAXB (Java API for XML Binding), 434 (JAX-RPC)
- JAXM (Java API for XML Messaging), 311 (JAX-RPC)
- JAXP (Java API for XML Processing), 26 (XML), 603–604 (JAXP), 806 (Appndx)
  - accessing XML documents, 628–629 (JAXP)
  - building XML document, 642–645 (JAXP)
  - versions, 12 (Overview)
- JAXR information model, 499–504 (JAXR)
- JAXR (Java API for XML Registries), 11–12 (Overview), 164 (UDDI), 203 (UDDI), 491 (JAXR)
  - conformance levels, 477 (JAXR)
  - connecting to UDDI registry, 479–487 (JAXR)
  - connection in J2EE, 486 (JAXR)
  - ebXML registries, 477 (JAXR), 499 (JAXR)
  - exceptions, 498 (JAXR)
  - failover mechanisms, 478 (JAXR)
  - Information Model, 477 (JAXR)
  - invalid URLs, 550 (JAXR)
  - J2EE components, 485 (JAXR)
  - language-specific name and description properties, 512–513 (JAXR)
  - looking up Web service in UDDI, 478 (JAXR)
  - mapping
    - object types with UDDI data structures, 500 (JAXR)
    - to UDDI Inquiry API, 581–599 (JAXR)
    - to UDDI Publishing API, 599–600 (JAXR)
  - names, 500 (JAXR)
  - object types with UUID key, 503 (JAXR)
  - predefined enumeration types, 575–578 (JAXR)
  - primary contact, 520–521 (JAXR)
  - Query and Life Cycle API, 477 (JAXR)
  - reference implementation, 481 (JAXR)
  - RegistryService interface, 489–491 (JAXR)
  - SOAP communications between browser and UDDI registry, 478 (JAXR)
  - special system property, 481 (JAXR)
  - specification version and capability level, 490 (JAXR)
  - standard configuration properties, 483 (JAXR)
  - taxonomies, 533 (JAXR)
  - UDDI registries, 475–478 (JAXR), 499 (JAXR)

- JAXR provider, 478 (JAXR), 480 (JAXR)
  - default language designator, 512 (JAXR)
  - internal taxonomy, 560–563 (JAXR)
  - validating URL, 558 (JAXR)
- JAXRException exception, 480 (JAXR), 498 (JAXR), 533 (JAXR), 558 (JAXR), 586 (JAXR)
- JAX-RPC compilers, 277 (JAX-RPC), 327 (JAX-RPC)
  - generating endpoint interface, 330 (JAX-RPC)
  - INOUT parameter, 458 (JAX-RPC)
  - listing parameters, 460–461 (JAX-RPC)
  - rules for mapping parts to method parameters, 461 (JAX-RPC)
  - service interfaces, 331–332 (JAX-RPC)
  - stub, 278 (JAX-RPC)
  - XML schema enumeration, 441 (JAX-RPC)
- JAX-RPC (Java API for XML-based RPC), 10 (Overview), 95 (SOAP and WSDL), 271–272 (JAX-RPC)
  - accessing Web services in non-Java environments, 273 (JAX-RPC)
  - as available resource to J2EE client, 334 (JAX-RPC)
  - BP-conformant Web services technologies, 273 (JAX-RPC)
  - caching generated stub, 334–335 (JAX-RPC)
  - client-side APIs, 11 (Overview), 281 (JAX-RPC)
  - client-side programming models, 273 (JAX-RPC), 277–281 (JAX-RPC)
  - configuring message handlers, 403 (JAX-RPC)
  - constants, 349–352 (JAX-RPC)
  - context parameter, 295–296 (JAX-RPC)
  - DII (Dynamic Invocation Interface), 11 (Overview), 280–281 (JAX-RPC), 344–352 (JAX-RPC)
  - DII without WSDL document, 829–835 (Appndx)
  - dynamic proxies, 11 (Overview), 280 (JAX-RPC), 338–344 (JAX-RPC)
- EJB (Enterprise JavaBeans) endpoints, 11 (Overview), 275–277 (JAX-RPC)
  - endpoint interface supporting INOUT and OUT parameters, 457 (JAX-RPC)
  - endpoints, 11 (Overview)
  - generated stubs, 11 (Overview), 277–280 (JAX-RPC), 327–338 (JAX-RPC)
  - generating WSDL documents, 427 (JAX-RPC)
  - holders, 456–459 (JAX-RPC)
  - Java API for Web services, 273 (JAX-RPC)
  - J2EE standard programming model, 427 (JAX-RPC)
  - J2EE Web Services, 273 (JAX-RPC)
  - JSE (JAX-RPC service endpoints), 274–275 (JAX-RPC)
  - JSE (JAX-RPC servlet endpoint), 11 (Overview)
  - mapping
    - between WSDL and Java, 278 (JAX-RPC)
    - from WSDL and XML to Java, 281 (JAX-RPC)
    - XML schema types to native primitive types, structures, and objects, 58 (XML)
  - message handlers, 281 (JAX-RPC)
  - naming unspecified parameters, 832
  - non-J2EE clients, 336–337 (JAX-RPC)
  - obtaining reference at runtime, 679–680 (Deployment)
  - one-to-one mapping between method argument names and accessor names of operation struct, 758 (Appndx)
  - One-Way messaging, 433–434 (JAX-RPC)
  - procedure-call semantics for RPC/Literal and Document/Literal, 110 (SOAP and WSDL)
  - properties, 349–352 (JAX-RPC)
  - purpose of, 273 (JAX-RPC)
  - reference implementation, 830 (Appndx)
  - Request/Response messaging, 433 (JAX-RPC)
  - RPC/Encoded messaging, 273–274 (JAX-RPC)
- SAAJ (SOAP with Attachments API for Java), 282 (JAX-RPC)
  - sending and receiving SOAP messages with MIME attachments (SwA), 811–829 (Appndx)
  - server-side components, 11 (Overview)
  - server-side programming models, 273–277 (JAX-RPC)
  - SOAP 1.1 clients and endpoints, 273 (JAX-RPC)
  - standard XML schema types, 444–445 (JAX-RPC)
  - supporting INOUT and OUT parameters, 456–467 (JAX-RPC)
  - SwA (SOAP Messages with Attachments), 273–274 (JAX-RPC), 281 (JAX-RPC), 771 (Appndx)
  - versions, 11 (Overview)
  - WSDL documents to generate endpoint and service interfaces, 427 (JAX-RPC)
  - WSDL faults mapping to Java exceptions, 661 (Deployment)
  - WS-I Basic Profile 1.0, 273 (JAX-RPC)
- JAX-RPC mapping files, 319 (JAX-RPC), 340 (JAX-RPC), 341–342 (JAX-RPC), 428–429 (JAX-RPC), 662–663 (Deployment)
  - exception-mapping element, 723–725 (Deployment)
  - heavyweight, 713–716 (Deployment)
  - java-wsdl-mapping element, 717 (Deployment)
  - java-xml-type-mapping element, 720–723 (Deployment)
  - lightweight, 709–713 (Deployment)
  - location of, 683 (Deployment), 700–701 (Deployment)
  - multiple package-mapping elements, 720 (Deployment)
  - package-mapping element, 717–720 (Deployment)
  - parts of, 716–734 (Deployment)
  - service-endpoint-interface-mapping element, 728–734 (Deployment)
  - service-interface-mapping element, 725–728 (Deployment)

- JAX-RPC Message Handler API and SAAJ (SOAP with Attachments API for Java), 353 (JAX-RPC)
- JAX-RPC non-standard XML Schema type, 445–446 (JAX-RPC)
- JAX-RPC provider, 128–129 (SOAP and WSDL)
  - application/xml MIME type, 820–822 (Appndx)
  - text/xml MIME type, 820–822 (Appndx)
- JAX-RPC reference, 683–685 (Deployment)
- JAX-RPC runtime, 412 (JAX-RPC), 416 (JAX-RPC)
- JAX-RPC service endpoint, 108 (SOAP and WSDL), 285 (JAX-RPC)
- JAX-RPC service interface, 680–681 (Deployment)
- JAX-RPC servlet, 284–285 (JAX-RPC), 296 (JAX-RPC)
- JAX-RPC specification
  - mapping between WSDL and generated stubs, 328 (JAX-RPC)
  - mapping from Java to WSDL, 659 (Deployment)
  - non-standard types, 444–449 (JAX-RPC)
- JAX-RPC stubs, 279 (JAX-RPC), 817–818 (Appndx)
- JAX-RPC Web service, 333–334 (JAX-RPC)
- JaxRpcExample\_8 file, 815–816 (Appndx)
- JaxRpcExample\_2 listing, 339 (JAX-RPC)
- JaxRpcExample\_3 listing, 342 (JAX-RPC)
- JaxRpcExample\_H1 file, 829 (Appndx)
- JAXRPCException exception, 414–415 (JAX-RPC), 835
- jaxrpc-mapping-file element, 683 (Deployment), 700–701 (Deployment)
- JAX-RPCXML-to-Java mapping, 434 (JAX-RPC)
- JDBC DataSource objects, 289 (JAX-RPC), 293 (JAX-RPC)
- JDBC (Java Database Connectivity), 2 (Overview), 305 (JAX-RPC)
- JTA (Java Transaction API) and, 307–308 (JAX-RPC)
- message handlers, 417–419 (JAX-RPC)
- transactional facilities, 306–307 (JAX-RPC)
- vendor-neutral API for accessing relational database, 477 (JAXR)
- /jdbc subcontext, 289 (JAX-RPC)
- JDOM, 26 (XML)
- J2EE 1.4
  - SOAP stacks, 91 (SOAP and WSDL)
  - stateless session bean as Web service endpoint, 315–326 (JAX-RPC)
  - Web Services APIs, 3 (Overview)
- J2EE application server, 309 (JAX-RPC), 324 (JAX-RPC)
- J2EE applications and EAR (Enterprise ARchive) file, 656–657 (Deployment)
- J2EE client and JAX-RPC service, 334 (JAX-RPC)
- J2EE components
  - accessing generated stubs, 336 (JAX-RPC)
  - accessing Web service endpoint, 332 (JAX-RPC)
  - ConnectionFactory class, 486 (JAXR)
  - deployment descriptors, 340 (JAX-RPC), 663 (Deployment)
  - deployment process, 655–657 (Deployment)
  - dynamic proxy, 280 (JAX-RPC)
  - endpoint interface, 657–660 (Deployment)
  - generated stubs, 279 (JAX-RPC), 343 (JAX-RPC)
- JAXR, 485 (JAXR)
- JNDI ENC (Environment Naming Context), 277, 288 (JAX-RPC), 332 (JAX-RPC)
- message handlers, 404–405 (JAX-RPC)
- reference to stub, 335 (JAX-RPC)
- services, 331–332 (JAX-RPC)
- J2EE ConnectionFactory, 289 (JAX-RPC)
- J2EE Connector Architecture, 311 (JAX-RPC)
- J2EE Connectors API, 2 (Overview)
- J2EE container system
  - generating dynamic proxies, 340 (JAX-RPC)
- J2SE Reflection API, 344 (JAX-RPC)
- message handlers, 395–396 (JAX-RPC)
- J2EE endpoint
  - implementation definition associated with, 698–700 (Deployment)
  - Web services deployment, 657–660 (Deployment)
- J2EE (Java 2 Enterprise Employment System)
  - configuring message handlers, 403 (JAX-RPC)
  - deployment descriptors, 655–656 (Deployment)
  - deployment process, 655–657 (Deployment)
  - generated stubs, 332–338 (JAX-RPC)
- JAR (Java Archive) files, 655–656 (Deployment)
- JAXR connection, 486–487 (JAXR)
- project naming conventions, 289 (JAX-RPC)
- specifications, 2–3 (Overview)
- Web services deployment, 657–663 (Deployment)
- J2EE servers deploying JSE, 284 (JAX-RPC)
- J2EE servlet container, 284 (JAX-RPC)
- J2EE servlets container system, 274–275 (JAX-RPC)
- J2EE Web Service APIs, 5 (Overview)
  - JAXP (Java API for XML Processing) API, 12 (Overview)
  - JAXR (Java API for XML Registries) API, 11–12 (Overview)
  - JAX-RPC (Java API for XML-based RPC), 10–11 (Overview)
  - SAAJ (SOAP with Attachments API for Java) API, 11 (Overview)
- J2EE Web Service endpoint, 108 (SOAP and WSDL)
- J2EE Web services
  - defining Web service endpoint interface for stateless session beans, 275 (JAX-RPC)
  - HTTP, 152 (SOAP and WSDL)
  - interoperability, 1 (Overview)
  - JAX-RPC, 273 (JAX-RPC)

- J2EE Web services (*cont.*)
    - Notification or Solicit/Response MEP (message exchange patterns), 147 (SOAP and WSDL)
    - SOAP 1.1, 81 (SOAP and WSDL)
    - SOAP bindings, 152 (SOAP and WSDL)
  - Jelliffe, Rick, 78 (XML)
  - JMS ConnectionFactory, 289 (JAX-RPC)
  - JMS (Java Message Service), 2 (Overview), 305 (JAX-RPC)
    - enterprise messaging systems, 311 (JAX-RPC)
  - JTA (Java Transaction API) and, 307–308 (JAX-RPC)
  - /jms subcontext, 289 (JAX-RPC)
  - JNDI ENC (JNDI Environment Naming Context), 277 (JAX-RPC), 285 (JAX-RPC), 320–321 (JAX-RPC), 333 (JAX-RPC), 486 (JAXR)
    - accessing
      - arbitrary J2EE connector, 290 (JAX-RPC)
      - EJBs, 290–291 (JAX-RPC)
      - JavaMail session object, 290 (JAX-RPC)
      - JDBC connection, 287 (JAX-RPC)
      - JMS ConnectionFactory, 289 (JAX-RPC)
      - Web services with JAX-RPC programming model, 291 (JAX-RPC)
    - configuring, 292 (JAX-RPC), 668–669 (Deployment)
    - J2EE components, 288 (JAX-RPC), 332 (JAX-RPC)
    - JSE accessing environment variables from, 292 (JAX-RPC)
    - lookup name, 679–680 (Deployment)
    - message handlers, 417–419 (JAX-RPC)
    - obtaining resource connections, 289–290 (JAX-RPC)
    - root context, 289 (JAX-RPC)
    - root of, 288 (JAX-RPC)
    - Service type, 346–347 (JAX-RPC)
    - view of, 288–289 (JAX-RPC)
  - JNDI (Java Naming and Directory Interface), 287 (JAX-RPC)
  - JNDI namespace “java:comp/env/service/BookQuoteService,” 333 (JAX-RPC)
  - JPEG image, 795 (Appndx)
  - JpegDataContentHandler DCH, 789 (Appndx)
  - JSE implementation object, 290–291 (JAX-RPC), 302 (JAX-RPC)
  - JSE instances
    - referencing to ServletEndpointContext interface, 296 (JAX-RPC)
    - Servlet container, 293 (JAX-RPC)
  - J2SE (Java 2 Platform, Standard Edition) 1.4, 2 (Overview)
  - J2SE Reflection API, 344 (JAX-RPC)
  - JSE Web service, invoking, 285 (JAX-RPC)
  - JSEs deployment
    - packaging JSEs in WAR file, 663–665 (Deployment)
    - web.xml file, 665–672 (Deployment)
  - JSEs (JAX-RPC service endpoints), 274–275 (JAX-RPC), 283 (JAX-RPC)
    - deploying, 284 (JAX-RPC)
    - elements access by, 285–286 (JAX-RPC)
    - endpoint interface, 274–275 (JAX-RPC), 283–284 (JAX-RPC)
    - endpoint methods, 283 (JAX-RPC)
    - example, 283–284 (JAX-RPC)
    - implementation class, 274–275 (JAX-RPC), 283–284 (JAX-RPC)
    - JNDI ENC (Environment Naming Context), 285 (JAX-RPC), 287–293 (JAX-RPC)
    - multi-threading, 302–303 (JAX-RPC)
    - runtime environment, 284–302 (JAX-RPC)
    - servlet programming model, 287 (JAX-RPC)
    - servlets, 285–287 (JAX-RPC)
    - single-threaded, 302–303 (JAX-RPC)
    - SingleThreadModel interface, 303 (JAX-RPC)
    - using JNDI ENC to get JDBC connection, 287–288 (JAX-RPC)
    - view of JNDI ENC, 288–289 (JAX-RPC)
  - JSEs (JAX-RPC servlet endpoints), 11 (Overview)
    - accessing environment variables, 292 (JAX-RPC)
    - configuring other aspects of, 669–672 (Deployment)
    - deployment descriptor, 292–293 (JAX-RPC)
    - destroying, 293–296 (JAX-RPC)
    - implementing ServiceLifecycle interface, 294–295 (JAX-RPC)
    - initializing, 293–296 (JAX-RPC)
    - interface to servlet container, 296 (JAX-RPC)
    - message handlers, 409–410 (JAX-RPC)
    - multi-threaded model, 416 (JAX-RPC)
    - naming, 696–697 (Deployment)
    - packaging in WAR files, 663–665 (Deployment)
    - WAR (Web ARchive) file, 657 (Deployment)
  - JSP (JavaServer Pages) components, 2 (Overview), 665–672 (Deployment)
  - JSPs (JavaServer Pages), 287 (JAX-RPC)
  - JTA (Java Transaction API), 307–308 (JAX-RPC)
  - JVMs (Java Virtual Machines), 2 (Overview)
- ## K
- Key type, 504 (JAXR)
  - keyedReference elements, 174–177 (UDDI), 189 (UDDI), 193 (UDDI), 198–199 (UDDI), 205 (UDDI), 205–207 (UDDI), 211 (UDDI), 218 (UDDI), 534–235 (JAXR), 542 (JAXR), 576 (JAXR)
  - keyName attribute, 175 (UDDI), 177–178 (UDDI), 180 (UDDI)
  - keyName UDDI field, 200 (UDDI)
  - KeyValuePair object, 421 (JAX-RPC), 687 (Deployment), 703 (Deployment)
  - keysOwned element, 256 (UDDI)
- ## L
- Language values, 172 (UDDI)
  - Language-agnostic WSDL definition, 661–662 (Deployment)

- LDAP (Lightweight Directory Access Protocol), 287 (JAX-RPC)
  - length facet, 69 (XML)
  - LifeCycleManager interface, 491–494 (JAXR), 548 (JAXR), 574 (JAXR)
    - createExternalIdentifier() method, 541–542 (JAXR)
    - factory methods, 492 (JAXR)
  - lifeCycleManagerURL property, 483 (JAXR)
  - Lightweight JAX-RPC mapping files, 709–713 (Deployment)
  - List types, 68–69 (XML)
  - Listener interfaces, 605 (JAXP)
  - literal encoding, 715 (Deployment)
  - Literal text, 24 (XML)
  - loadService() method, 337 (JAX-RPC)
  - Local attributes, 52 (XML)
  - Local elements, 52–53 (XML)
  - Local file system pointing to schema, 57 (XML)
  - Local interfaces, 315 (JAX-RPC)
  - Local references, 768–769 (Appndx)
  - Locale object, 386 (JAX-RPC), 515 (JAXR)
  - LocalizedString interface, 513 (JAXR)
  - LocalizedString objects, 513–515 (JAXR)
  - localName parameter, 615 (JAXP)
  - location attribute, 137 (SOAP and WSDL), 162 (SOAP and WSDL)
  - log() method, 301 (JAX-RPC)
  - Logger message handler, 701–702 (Deployment), 704–705 (Deployment)
  - Logger role message path, 101 (SOAP and WSDL)
  - LoggerHandler class, 419 (JAX-RPC)
  - LoggerHandler message handler, 409–411 (JAX-RPC), 417 (JAX-RPC)
  - Logging intermediary, 99 (SOAP and WSDL)
  - long type, 38 (XML)
  - lookup() method, 289 (JAX-RPC)
- M**
- /mail subcontext, 289 (JAX-RPC)
  - mailcap files, 786–788 (Appndx), 818 (Appndx)
  - MailcapCommandMap class, 787 (Appndx)
  - makeRegistrySpecificRequest() method, 491 (JAXR)
  - Mandatory attribute, 673 (Deployment)
  - Mandatory header blocks, 102–105 (SOAP and WSDL)
  - Mapping
    - Holder types from WSDL, 457–467 (JAX-RPC)
    - from Java to WSDL, 659 (Deployment)
    - JAXR to UDDI Inquiry API, 581–599 (JAXR)
    - JAXR to UDDI Publishing API, 599–600 (JAXR)
    - JAX-RPC endpoint interface to WSDL portType and binding definitions, 728–734 (Deployment)
    - UDDI data structures and JAXR object types, 500 (JAXR)
    - from WSDL and XML to Java, 281 (JAX-RPC)
    - WSDL fault message to Java exception class, 723–725 (Deployment)
    - WSDL service definition to custom JAX-RPC service interface type, 725–728 (Deployment)
    - xsd:any type to SOAPElement type, 450–451 (JAX-RPC)
  - Mapping files, 428–429 (JAX-RPC)
  - Mapping WSDL to Java, 428 (JAX-RPC)
    - declaring multiple parts, 430 (JAX-RPC)
    - defining multiple operations, 432–433 (JAX-RPC)
    - name-collision rules, 429 (JAX-RPC)
    - One-Way messaging, 433–434 (JAX-RPC)
    - WSDL-to-endpoint interfaces, 429 (JAX-RPC)
  - Mapping XML Schema to Java, 434–435 (JAX-RPC)
    - arrays, 440 (JAX-RPC)
    - enumerations, 441–443 (JAX-RPC)
    - nillable elements, 451–452 (JAX-RPC)
    - SOAPElement type, 450–451 (JAX-RPC)
    - supporting non-standard types in Document/Literal encoding, 443–449 (JAX-RPC)
  - XML Schema built-in simple types, 435–436 (JAX-RPC)
  - XML Schema complex types, 436–440 (JAX-RPC)
    - xsd:any element, 450–451 (JAX-RPC)
  - Markup languages, detailed description of, 739–743 (Appndx)
  - MathML, 19 (XML)
  - maxLength facet, 69 (XML)
  - maxOccurs attribute, 45–46 (XML), 60 (XML), 438 (JAX-RPC), 440 (JAX-RPC)
  - maxRows attribute, 214 (UDDI)
  - maxRows property, 483 (JAXR)
  - MDBs (message-driven beans), 311 (JAX-RPC)
  - MEPs (messaging exchange patterns), 104 (SOAP and WSDL)
    - versus messaging modes, 110–111 (SOAP and WSDL)
  - Notification messaging, 147–148 (SOAP and WSDL)
  - One-Way messaging, 147 (SOAP and WSDL)
  - Request/Response messaging, 145–147 (SOAP and WSDL)
  - Solicit/Response messaging, 147–148 (SOAP and WSDL)
  - message attribute, 159 (SOAP and WSDL), 161 (SOAP and WSDL)
  - message element, 129–130 (SOAP and WSDL), 133 (SOAP and WSDL), 137–143 (SOAP and WSDL), 428 (JAX-RPC), 657 (Deployment), 720 (Deployment)
    - definitions, 234 (UDDI), 278 (JAX-RPC)
    - reusing definitions, 433 (JAX-RPC)
  - Message handler class, 396–400 (JAX-RPC)
  - Message handlers, 281 (JAX-RPC), 353 (JAX-RPC), 395 (JAX-RPC), 685–691 (Deployment)
    - class implementing, 687 (Deployment)
    - configuration information, 419–420 (JAX-RPC)

- Message handlers, (*cont.*)
  - configuring, 403–404 (JAX-RPC), 410 (JAX-RPC)
  - declaring, 701–702 (Deployment)
  - multiple, 407–408 (JAX-RPC)
    - in webservices.xml deployment descriptor, 410 (JAX-RPC)
  - describing initialization parameters, 687 (Deployment)
  - display elements, 691 (Deployment), 706 (Deployment)
  - EJB endpoints, 409–410 (JAX-RPC)
  - example, 396–405 (JAX-RPC)
  - exceptions, 414–415 (JAX-RPC)
  - exchanging information or state between, 416 (JAX-RPC)
  - filtering messages sent and received by J2EE endpoints, 701–706 (Deployment)
  - generated stubs configured to use, 404–405 (JAX-RPC)
  - handler chains, 406–415 (JAX-RPC)
  - identifying roles, 688–690 (Deployment)
  - implementing, 702 (Deployment)
  - initialization parameters, 421–422 (JAX-RPC), 702–703 (Deployment)
  - initialization parameters configuration, 421 (JAX-RPC)
  - instance variables, 416–417 (JAX-RPC)
  - JDBC, 417–419 (JAX-RPC)
  - J2EE components, 404–405 (JAX-RPC)
  - J2EE container system, 395–396 (JAX-RPC)
  - JNDI ENC, 417–419 (JAX-RPC)
  - JSEs, 409–410 (JAX-RPC)
  - life cycle, 419–422 (JAX-RPC)
  - multi-threading, 416–417 (JAX-RPC)
  - order of processing, 406–415 (JAX-RPC)
  - outgoing and incoming messages, 408 (JAX-RPC)
  - proper processing by, 690–691 (Deployment), 705–706 (Deployment)
  - return values, 411–414 (JAX-RPC)
  - runtime environment, 416–424 (JAX-RPC)
  - runtime error, 415 (JAX-RPC)
  - skipping over, 413 (JAX-RPC)
  - statelessness, 416–417 (JAX-RPC)
  - types of header blocks, 399 (JAX-RPC)
  - unique identifier, 686 (Deployment), 702 (Deployment)
  - Web service endpoints, 409 (JAX-RPC)
  - WSDL port, 690 (Deployment)
  - XML qualified header block name, 688 (Deployment)
- Message path, 95–96 (SOAP and WSDL)
  - different roles for nodes, 99 (SOAP and WSDL)
  - logger role, 101 (SOAP and WSDL)
  - nodes, 98 (SOAP and WSDL)
  - SOAP intermediaries, 96 (SOAP and WSDL)
  - standard role types, 102 (SOAP and WSDL)
- MessageContext interface, 423 (JAX-RPC)
- MessageContext object, 296 (JAX-RPC), 326 (JAX-RPC), 416 (JAX-RPC)
- MessageContext type, 422–424 (JAX-RPC)
- MessageFactory class, 354 (JAX-RPC), 357–360 (JAX-RPC)
- MessageFactory object, 356 (JAX-RPC)
- message-id element, 87 (SOAP and WSDL)
- message-id header block, 96 (SOAP and WSDL), 106 (SOAP and WSDL), 157–159 (SOAP and WSDL), 380 (JAX-RPC), 396 (JAX-RPC), 400 (JAX-RPC), 409–410 (JAX-RPC), 705 (Deployment)
  - adding to SOAP messages, 397–400 (JAX-RPC)
  - processing, 99–100 (SOAP and WSDL)
- MessageID message handler, 685–686 (Deployment)
- MessageIDHandler class, 397–400 (JAX-RPC), 403 (JAX-RPC)
- MessageIDHandler message handler, 406 (JAX-RPC), 690 (Deployment)
- MessageIDHeader class, 381 (JAX-RPC)
- MessageIDHeader class, 380–381 (JAX-RPC)
- Messages
  - definitions, 141–144 (SOAP and WSDL)
  - definitions to declare faults, 140–142 (SOAP and WSDL)
  - naming, 138 (SOAP and WSDL)
  - payload used by Web service, 137–142 (SOAP and WSDL)
  - processing asynchronous, 311 (JAX-RPC)
- Messaging modes
  - encoding style, 107 (SOAP and WSDL)
  - versus* MEPS (messaging exchange patterns), 110–111 (SOAP and WSDL)
  - messaging style, 107 (SOAP and WSDL)
  - SOAP, 107–111 (SOAP and WSDL)
- Messaging style, 107 (SOAP and WSDL), 153 (SOAP and WSDL)
- Metacharacters, 746–748 (Appndx)
- META-INF subdirectory, 664 (Deployment), 787 (Appndx)
- META-INF/mailcap case, 787 (Appndx)
- method-name element, 675 (Deployment)
- method-param-parts-mapping element, 731–732 (Deployment)
- method-permission element, 674 (Deployment)
- Method-ready pool, 322 (JAX-RPC)
- Methods, 675 (Deployment)
- mh:getBookPrice element, 644 (JAXP)
- mh:xmlFragment return type, 451 (JAX-RPC)
- Microsoft, 165 (UDDI), 166 (UDDI), 478 (JAXR)
- Microsoft .NET
  - code generators, 128 (SOAP and WSDL)
  - SOAP stacks, 91 (SOAP and WSDL)
- MIME attachments
  - INOUT and OUT parameters, 823–825 (Appndx)
  - as return types, 823–825 (Appndx)
  - WSDL documents defining, 812–814 (Appndx)

- MIME bindings, 150–151 (SOAP and WSDL)
  - MIME headers, 358 (JAX-RPC), 781
    - handling data described by, 783–792 (Appndx)
    - methods, 799–803 (Appndx)
  - MIME messages, 781 (Appndx)
  - MIME (Multipurpose Internet Mail Extensions), 772–775 (Appndx)
    - attachment or MIME part, 773–775 (Appndx)
    - Base64 encoding, 753 (Appndx)
    - headers, 774 (Appndx)
    - SOAP, 775–778 (Appndx)
    - SwA (SOAP Messages with Attachments), 775–778 (Appndx)
    - type of content, 774 (Appndx)
    - version used, 774 (Appndx)
  - MIME parts, 773 (Appndx)
    - Base64 encoding, 775 (Appndx)
    - CIDs (content-ids), 777–778 (Appndx)
    - Content-ID header, 777 (Appndx)
    - Content-Type header, 774 (Appndx)
    - GIF, 778 (Appndx)
    - PDF, 778 (Appndx)
  - MIME types
    - adding, 795–798 (Appndx)
    - associating with applications, 783 (Appndx)
    - dynamically discovering, 791–792 (Appndx)
    - mapping
      - to DCHs, 786–788 (Appndx)
      - to Java, 816–825 (Appndx)
      - in SAAJ/JAX-RPC, 787 (Appndx)
    - .pdf extension, 801 (Appndx)
    - unsupported, 827 (Appndx)
  - MimeHeaders parameter, 358 (JAX-RPC)
  - MimeMultipart class, 798 (Appndx), 818–820 (Appndx)
  - mime:part element, 814 (Appndx)
  - mimetypes.default file, 791–792 (Appndx), 801 (Appndx)
  - minLength facet, 69 (XML)
  - minOccurs attribute, 45–46 (XML), 60 (XML), 438 (JAX-RPC)
  - Mixed element-and-text content data, 34 (XML)
  - MoneyTransferEJB, 312 (JAX-RPC), 314 (JAX-RPC)
  - MoneyTransferEJB class, 313 (JAX-RPC)
  - Monson-Haefel Books
    - businessEntity instance data, 169–170 (UDDI)
  - Monson-Haefel Markup Language, 35 (XML)
    - PurchaseOrder type, 41–42 (XML)
    - schema, 35 (XML)
  - MTS (Microsoft Transaction Server), 308 (JAX-RPC)
  - Multi-dimensional arrays, 764–765
  - multipart/\* MIME type, 817 (Appndx), 818–820 (Appndx)
  - Multipart/Related content type, 776 (Appndx)
  - Multipart/Related MIME message style, 800 (Appndx)
  - Multipart/Related MIME messages, 777 (Appndx)
  - Multipart/Related MIME types, 777–778 (Appndx)
    - multipart/related type, 781 (Appndx)
  - Multi-threading
    - JSEs (JAX-RPC service endpoints), 302–303 (JAX-RPC)
    - message handlers, 416–417 (JAX-RPC)
  - mustUnderstand attribute, 98 (SOAP and WSDL), 102–105 (SOAP and WSDL), 375–376 (JAX-RPC), 706 (Deployment)
  - MustUnderstand fault code, 116 (SOAP and WSDL), 118 (SOAP and WSDL), 120 (SOAP and WSDL), 264 (UDDI)
  - myDate variable, 453–455 (JAX-RPC)
  - myInt variable, 455 (JAX-RPC)
- ## N
- NAICS 1997 tModel, 189–190 (UDDI)
  - NAICS (North American Industry Classification System), 176–177 (UDDI), 527 (JAXR), 532 (JAXR), 559–560 (JAXR)
  - NAICS value, 206 (UDDI)
  - name attribute, 133 (SOAP and WSDL), 157 (SOAP and WSDL), 332 (JAX-RPC)
  - name elements, 39 (XML), 45 (XML), 49 (XML), 59–60 (XML), 172 (UDDI), 194–195 (UDDI), 205 (UDDI), 207–208 (UDDI), 215 (UDDI), 512 (JAXR), 515 (JAXR)
  - Name interface, 366 (JAX-RPC)
  - Name object, 377 (JAX-RPC), 386 (JAX-RPC), 809 (Appndx)
  - Name parameter, 385 (JAX-RPC)
  - name property, 556 (JAXR)
  - Name type, 364–367 (JAX-RPC)
  - Name type objects, creation of, 364–365 (JAX-RPC)
  - Named arguments, defining set of, 757 (Appndx)
  - Named types, 71 (XML)
  - namePattern criteria, 586–587 (JAXR)
  - namespace attribute, 136–137 (SOAP and WSDL), 155 (SOAP and WSDL)
  - Namespace constants, 351 (JAX-RPC)
  - namespace tModel type, 191 (UDDI)
  - NamespaceConstants class, 350 (JAX-RPC)
  - namespace-prefixes property, 611 (JAXP)
  - Namespaces
    - avoiding element name collisions, 31–32 (XML)
    - based on URLs, 31 (XML)
    - constants, 379 (JAX-RPC)
    - declaring, 28 (XML), 93 (SOAP and WSDL)
    - default, 29–31 (XML), 36 (XML)
    - different versions of SOAP message, 92 (SOAP and WSDL)
    - Envelope element, 89–90 (SOAP and WSDL)
    - example of usage, 26–29 (XML)
    - header blocks, 90 (SOAP and WSDL)
    - locally scoped, 93 (SOAP and WSDL)
    - with meta-data, 185–198 (UDDI)
    - prefixes, 29–31 (XML)
    - Purchase Order Markup Language, 90–91 (SOAP and WSDL)
    - reusable code modules, 32 (XML)

- Namespaces (*cont.*)
    - SOAP, 88–96 (SOAP and WSDL)
    - SOAP-WSDL binding, 149 (SOAP and WSDL)
    - values as constants, 378–379 (JAX-RPC)
    - versioning system, 32 (XML)
    - WSDL 1.1 XML schema, 133 (SOAP and WSDL)
    - XML (eXtensible Markup Language), 26–32 (XML)
    - XML schema-instance, 56 (XML)
  - NamespaceSupport class, 619 (JAXP)
  - namespaceURI parameter, 615 (JAXP)
  - Name-value pairs attributes, 23 (XML)
  - Naming service, accessing, 287 (JAX-RPC)
  - negativeInteger type, 38 (XML)
  - Nested anonymous types, 71 (XML)
  - .NET platform and MTS functionality, 308 (JAX-RPC)
  - Networks, exchanging data over, 81 (SOAP and WSDL)
  - Never attribute, 673 (Deployment)
  - newInstance() method, 322 (JAX-RPC), 357 (JAX-RPC), 628 (JAXP)
  - next actor attribute, 378 (JAX-RPC)
  - next actor role, 375 (JAX-RPC), 409 (JAX-RPC)
  - next role, 100 (SOAP and WSDL)
  - NIIP (National Industrial Infrastructure Protocols Consortium), 166 (UDDI)
  - Nillable elements, 451–452 (JAX-RPC)
  - Nillable xsd:int element, 451 (JAX-RPC)
  - NMTOKEN type, 38 (XML)
  - NMTOKENS.NMTOKENS list type, 69 (XML)
  - node element, 96–98 (SOAP and WSDL)
  - Node interface, 630–632 (JAXP), 648–649 (JAXP)
    - attribute methods, 636–637 (JAXP)
    - constant value, 632–633 (JAXP)
    - methods for child management, 641 (JAXP)
    - type-dependent properties, 632–634 (JAXP)
    - utility methods, 641 (JAXP)
  - Node type, 367 (JAX-RPC), 370–372 (JAX-RPC)
  - Node.appendNode() method, 391 (JAX-RPC)
  - Nodes, 625 (JAXP)
    - accessing attributes, 636–637 (JAXP)
    - causing fault, 114 (SOAP and WSDL)
    - children, 639 (JAXP)
    - cloning, 641 (JAXP)
    - constants, 633 (JAXP)
    - copying, 649–651 (JAXP)
    - DOM (Document Object Model), 628–641 (JAXP)
    - generating fault, 118 (SOAP and WSDL)
    - identifying function to be performed by, 98–102 (SOAP and WSDL)
    - interface types, 633 (JAXP)
    - knowing how to process header block, 116 (SOAP and WSDL)
    - malfunctioning, 114–115 (SOAP and WSDL)
    - message path, 98 (SOAP and WSDL)
    - navigating tree, 638–640 (JAXP)
    - owner document, 638 (JAXP)
    - parents, 638 (JAXP)
    - removing white space, 641 (JAXP)
    - reusing, 649 (JAXP)
    - siblings, 639 (JAXP)
    - SOAP fault, 103 (SOAP and WSDL)
    - testing for supported features, 641 (JAXP)
    - types, 632 (JAXP)
    - unable to process SOAP message, 114–115 (SOAP and WSDL)
    - XML name methods, 634–636 (JAXP)
  - Non-Java platforms communicating with Java, 273 (JAX-RPC)
  - Non-J2EE clients and JAX-RPC, 336–337 (JAX-RPC)
  - Non-JMS messaging systems, 311 (JAX-RPC)
  - Non-normalized XML documents, 639–640 (JAXP)
  - Non-standard fault codes, 116–117 (SOAP and WSDL)
  - Non-standard types, 443–449 (JAX-RPC)
  - Non-standard XML APIs, 26 (XML)
  - Non-text documents, 19 (XML)
  - normalize() method, 641 (JAXP)
  - Normalized XML documents, 639–640 (JAXP)
  - normalizedString type, 38 (XML)
  - note element and HTML, 24–25 (XML)
  - Notification messaging, 147–148 (SOAP and WSDL)
  - NotSupported attribute, 673 (Deployment)
  - ntis-gov:naics:1997 UDDI standard tModel, 190 (UDDI), 194 (UDDI)
  - NTT, 166 (UDDI), 478 (JAXR)
  - Number of times, 45 (XML)
- ## O
- OASIS ebXML Registry Reference Implementation, 499 (JAXR)
  - OASIS (Organization for the Advancement of Structured Information Standards), 10 (Overview), 106 (SOAP and WSDL), 165 (UDDI)
  - OASIS WS-Security standard, 106 (SOAP and WSDL)
  - Object array, 348 (JAX-RPC), 764–765 (Appndx), 834 (Appndx)
  - Object.getClass() method, 832 (Appndx)
  - Objects, 12 (Overview), 280 (JAX-RPC)
  - ObjectType enumeration, 575 (JAXR)
  - Occurrence constraints, 45–48 (XML)
  - One-dimensional arrays, 765–766 (Appndx)
  - One-Way, Document/Literal messaging with MIME binding, 814 (Appndx)
  - One-Way SOAP messages, 82 (SOAP and WSDL), 104 (SOAP and WSDL), 123 (SOAP and WSDL), 147 (SOAP and WSDL)
  - DII (Dynamic Invocation Interface), 349 (JAX-RPC)
  - generated stubs, 337 (JAX-RPC)
  - JAX-RPC, 433–434 (JAX-RPC)
  - mapping WSDL to Java, 433–434 (JAX-RPC)

- portType element, 433–434 (JAX-RPC)
  - operation elements, 129–130 (SOAP and WSDL), 143–145 (SOAP and WSDL), 154 (SOAP and WSDL), 278 (JAX-RPC), 433 (JAX-RPC), 435 (JAX-RPC), 458 (JAX-RPC), 759 (Appndx), 832 (Appndx)
  - Operation structs, 756–459 (Appndx)
  - Operations, 146 (SOAP and WSDL), 457 (JAX-RPC)
    - fault elements, 157 (SOAP and WSDL)
    - grouping, 305–308 (JAX-RPC)
    - messaging style, 152–155 (SOAP and WSDL)
    - parameter order within, 144–145 (SOAP and WSDL)
    - reporting errors, 379–380 (JAX-RPC)
  - operator attribute, 214 (UDDI), 239 (UDDI), 257 (UDDI), 260 (UDDI)
  - Operator sites, 166 (UDDI), 478 (JAXR)
  - Oracle, 165 (UDDI)
  - OR\_ALL\_KEYS constant, 592 (JAXR), 593 (JAXR)
  - orAllKeys qualifier, 213 (UDDI)
  - Order of processing, 406–415 (JAX-RPC)
  - orderDate attribute, 43–45 (XML), 47 (XML)
  - Organization instance, 491 (JAXR)
  - Organization interface, 549 (JAXR)
    - service methods, 508 (JAXR)
    - services, 543–544 (JAXR)
    - user methods, 508 (JAXR)
  - Organization objects, 487–489 (JAXR), 495–496 (JAXR)
    - associating, 570–572 (JAXR)
    - classifications, 528–530 (JAXR)
    - creation of, 504–506 (JAXR)
    - description of, 514–516 (JAXR)
    - external identifiers, 538 (JAXR)
    - ExternalIdentifier object, 538–541 (JAXR)
    - finding, 531 (JAXR)
    - matching criteria, 597 (JAXR)
    - searching for, 587–591 (JAXR)
    - standard UDDI classifications, 531–534 (JAXR)
  - Organization type, 503 (JAXR)
  - Organization.getService() method, 581 (JAXR)
  - Organizations
    - accessing Classification objects associated with, 537–538 (JAXR)
    - adding ServiceBinding, 546–548 (JAXR)
    - assigning User object to, 517 (JAXR)
    - associations, 570–575 (JAXR)
    - business-domain type, 12 (Overview)
    - classifications, 527–538 (JAXR)
    - descriptions, 512 (JAXR)
    - ExternalLink objects associated with, 510 (JAXR)
    - grouping Web services, 545–553 (JAXR)
    - name, 520 (JAXR)
    - name searches, 586–587 (JAXR)
    - naming, 512 (JAXR)
    - nature of relationship between, 572–574 (JAXR)
    - UUID key, 548 (JAXR), 567 (JAXR)
  - org.w3c.dom.Document interface, 625 (JAXP), 649 (JAXP) (Appndx)
  - org.w3c.dom.Node class, 806 (Appndx)
  - org.w3c.dom.Node interface, 625 (JAXP), 630–632 (JAXP)
  - org.xml.sax.Attributes interface, 615–616 (JAXP)
  - org.xml.sax.ContentHandler interface, 608–621 (JAXP)
  - org.xml.sax.driver system property, 607 (JAXP)
  - org.xml.sax.DTDHandler interface, 622 (JAXP)
  - org.xml.sax.EntityResolver interface, 622 (JAXP)
  - org.xml.sax.ErrorHandler interface, 622 (JAXP)
  - org.xml.sax.helpers.DefaultHandler class, 609 (JAXP)
  - org.xml.sax.helpers.NamespaceSupport class, 619 (JAXP)
  - org.xml.sax.helpers.XMLReaderFactory class, 606–608 (JAXP)
  - org.xml.sax.XMLReader class, 606–608 (JAXP)
  - OR\_LIKE\_KEYS constant, 593 (JAXR)
  - orLikeKeys qualifier, 213 (UDDI)
  - OUT parameters, 144 (SOAP and WSDL), 280 (JAX-RPC), 431–432 (JAX-RPC), 453–454 (JAX-RPC), 458–459 (JAX-RPC), 823–825 (Appndx)
    - C#, 455 (JAX-RPC)
    - JAX-RPC, 456–457 (JAX-RPC)
    - pass-by-reference, 456 (JAX-RPC)
  - output element, 133 (SOAP and WSDL), 142 (SOAP and WSDL), 146–147 (SOAP and WSDL), 157 (SOAP and WSDL), 444 (JAX-RPC)
  - output messages, 143–145 (SOAP and WSDL), 435 (JAX-RPC), 457–458 (JAX-RPC)
  - overviewDoc element, 195–198 (UDDI), 557 (JAXR)
  - overviewDoc property, 556 (JAXR)
  - overviewDoc type, 195 (UDDI)
  - overviewURL element, 188 (UDDI), 195–196 (UDDI)
  - Owner document, 638 (JAXP)
- ## P
- package-mapping element, 712–713 (Deployment), 717–720 (Deployment)
  - Packages, 26 (XML)
  - Packaging EJB endpoints in JAR files, 319–320 (JAX-RPC)
  - parameter-mode element, 732 (Deployment)
  - ParameterMode type, 832 (Appndx)
  - parameterOrder attribute, 144–145 (SOAP and WSDL), 348 (JAX-RPC), 457–461 (JAX-RPC)
  - param-position element, 732 (Deployment)
  - param-type elements, 732 (Deployment)
  - Parent, 741 (Appndx)
  - Parent-child relationships, 573 (JAXR)
  - Parents in nodes, 638 (JAXP)
  - Parser API, 20 (XML)
  - Parsing XML documents, 606–608 (JAXP)
  - part attribute, 155 (SOAP and WSDL), 159 (SOAP and WSDL)
  - part definition, 141 (SOAP and WSDL)

- part elements, 140 (SOAP and WSDL), 457 (JAX-RPC), 657 (Deployment), 659 (Deployment)
- Partially transmitted arrays, 766 (Appndx)
- Pass-by-copy, 453–454 (JAX-RPC)
- Pass-by-reference, 454–456 (JAX-RPC)
- PasswordAuthentication class, 485 (JAXR)
- PASSWORD\_PROPERTY authentication, 349 (JAX-RPC)
- Pattern facet, 745 (Appndx)
- pattern facet, 66–67 (XML)
- PDF document, 795 (Appndx)
- .pdf extension and MIME type, 801 (Appndx)
- PDF MIME parts, 778 (Appndx)
- Peer-to-peer relationships, 573 (JAXR)
- Perl::Lite, 91 (SOAP and WSDL), 129 (SOAP and WSDL)
- Persistent business objects, 310 (JAX-RPC)
- personName element, 521 (JAXR)
- personName property, 521 (JAXR)
- PersonName type, 521 (JAXR)
- phone element, 23 (XML)
- Phone numbers, 523–524 (JAXR)
- PhoneType enumeration, 575 (JAXR)
- plain text, 820 (Appndx)
- Plus sign (+) cardinality symbol, 741 (Appndx)
- Plus sign (+) quantifier, 746–747 (Appndx)
- Polymorphic arrays, 763–764 (Appndx)
- polymorphism and Java, 764 (Appndx)
- Polymorphism and schemas, 61–63 (XML)
- port elements, 161–162 (SOAP and WSDL), 188 (UDDI), 328 (JAX-RPC), 332 (JAX-RPC)
- port-component element, 694–696 (Deployment)
- port-component-name element, 696–697 (Deployment)
- port-component-ref element, 683–685 (Deployment)
- port-mapping element, 728 (Deployment)
- port-name element, 690 (Deployment)
- Ports, 83 (SOAP and WSDL), 341 (JAX-RPC)
- portType element, 129–130 (SOAP and WSDL), 133 (SOAP and WSDL), 142–143 (SOAP and WSDL), 147 (SOAP and WSDL), 328 (JAX-RPC), 428 (JAX-RPC), 449 (JAX-RPC), 657 (Deployment), 720 (Deployment)
- declaring IN, INOUT, and OUT parameters, 460 (JAX-RPC)
- definition of, 234 (UDDI), 278 (JAX-RPC), 428–429 (JAX-RPC), 435 (JAX-RPC)
- mapping to
  - concrete protocols, encoding styles and messaging styles, 148–161 (SOAP and WSDL)
  - parameters and return types of endpoint interface, 461 (JAX-RPC)
- multiple
  - input parameters, 430 (JAX-RPC)
  - operations, 432–433 (JAX-RPC)
  - output parameters, 431 (JAX-RPC)
- One-Way messaging, 433–434 (JAX-RPC)
- referring
  - to enumeration type, 441–442 (JAX-RPC)
  - to nillable type, 451–452 (JAX-RPC)
  - to XML complex type, 437 (JAX-RPC)
- positiveInteger type, 38 (XML)
- Postal addresses, 524–526 (JAXR)
- PostalAddress business-domain type, 12 (Overview)
- PostalAddress object, 524–526 (JAXR)
- postalAddress tModel type, 191 (UDDI)
- PostalAddress type, 517 (JAXR)
- postalAddressScheme property, 483 (JAXR)
- PostalAddressType enumeration, 575 (JAXR)
- Predefined enumerations, 573 (JAXR), 575–578 (JAXR), 599 (JAXR)
- Prefixed label, 133 (SOAP and WSDL)
- PrefixHandler content handler, 618–619 (JAXP)
- Primary data structures and UDDI, 167–168 (UDDI)
- Principal object, 296–297 (JAX-RPC), 324–325 (JAX-RPC)
- Private UDDI registries, 485 (JAXR)
- processed-by header block, 96–98 (SOAP and WSDL), 101 (SOAP and WSDL), 104 (SOAP and WSDL), 106 (SOAP and WSDL), 409 (JAX-RPC), 705 (Deployment)
- ProcessedByHandler message handler, 406 (JAX-RPC)
- Processing XML with Java* (Harold), 624 (JAXP)
- processingInstruction() method, 621 (JAXP)
- Products and services classifications, 527 (JAXR)
- Programmers and interoperability, 4 (Overview)
- Programming languages
  - enumerations, 441 (JAX-RPC)
  - INOUT and OUT parameters, 431–432 (JAX-RPC)
  - pass-by-reference, 454–456 (JAX-RPC)
- Projected references, 249 (UDDI)
- Properties
  - constants representing standard, 350 (JAX-RPC)
  - JAX-RPC API, 349–352 (JAX-RPC)
  - type-dependent, 632–634 (JAXP)
- Protocols
  - SOAP messages, 82 (SOAP and WSDL)
  - SOAP-specific elements, 148–149 (SOAP and WSDL)
  - tModel type, 192 (UDDI)
- Publisher API
  - accessing, 203 (UDDI)
  - delete operations, 247–254 (UDDI)
  - Get operations, 254–263 (UDDI)
  - publisherAssertion data structures, 167 (UDDI), 199 (UDDI), 233 (UDDI), 574 (JAXR)
  - adding, 245–246 (UDDI)
  - definition of, 198 (UDDI)
  - deleting, 253–254 (UDDI)

- returning, 259–261 (UDDI)
  - updating, 246–247 (UDDI)
  - publisherAssertion relationships, 218 (UDDI)
  - Publishing API, 201 (UDDI)
    - authentication, 585–586 (JAXR)
    - authorization operations, 233 (UDDI), 235–238 (UDDI)
    - delete operations, 233 (UDDI)
    - get operations, 233 (UDDI)
    - HTTPS (HTTP with SSL 3.0), 233 (UDDI)
    - operation definitions and payloads, 234–263 (UDDI)
    - save operations, 233 (UDDI), 238–247 (UDDI)
  - Publishing operation, 481–482 (JAXR)
  - Purchase Order Markup Language, 28 (XML), 51 (XML), 445 (JAX-RPC)
    - namespaces, 90–91 (SOAP and WSDL)
    - XML schema, 446 (JAX-RPC)
  - Purchase Order schema, 70 (XML), 74 (XML), 76 (XML)
  - Purchase Order SOAP message, 107 (SOAP and WSDL)
  - PurchaseOrder complex type, 37 (XML)
  - purchaseOrder document, 444 (JAX-RPC)
  - PurchaseOrder documents
    - schema, 28 (XML)
  - purchaseOrder documents
    - fragment, 445 (JAX-RPC)
  - purchaseOrder element, 28 (XML), 49–50 (XML), 50 (XML), 70–71 (XML), 84–85 (SOAP and WSDL), 88 (SOAP and WSDL)
    - default namespace, 29 (XML)
    - orderDate attribute, 47 (XML)
  - PurchaseOrder endpoint interface, 449 (JAX-RPC)
  - PurchaseOrder parameter, 444 (JAX-RPC)
  - PurchaseOrder type, 35 (XML), 41–46 (XML), 61 (XML), 65 (XML), 70–71 (XML), 74 (XML), 445 (JAX-RPC)
  - PurchaseOrder Web service, 443–445 (JAX-RPC), 449 (JAX-RPC), 720 (Deployment)
  - PurchaseOrder XML document
    - address information, 27–28 (XML)
  - PurchaseOrderResponse type, 449 (JAX-RPC)
  - Push model, 147 (SOAP and WSDL)
- ## Q
- QName class, 343 (JAX-RPC)
  - QName constants, 351 (JAX-RPC)
  - QName objects, constructing, 350 (JAX-RPC)
  - qName parameter, 615 (JAXP)
  - QName prefixes, 52 (XML)
  - QName type, 831 (Appndx)
  - QNames, 32 (XML)
  - qNames (qualified XML names), 31 (XML), 634 (JAXP)
  - QName.valueOf() method, 343 (JAX-RPC)
  - Qualified elements, 52–55 (XML)
  - Qualities of service, 106 (SOAP and WSDL)
  - Quantifiers, 745–748 (Appndx)
  - Queries and findQualifiers element, 210–211 (UDDI)
  - Query and Life Cycle API, 477 (JAXR)
  - QueryManager object, 568 (JAXR)
  - QueryManager type, 531 (JAXR)
  - queryManagerURL property, 483 (JAXR)
  - Question mark (?) cardinality symbol, 741 (Appndx)
  - Question mark (?) quantifier, 747 (Appndx)
- ## R
- RAR (Resource ARchive) file, 656–657 (Deployment)
  - Reading and writing data streams, 784 (Appndx)
  - Receivers, 95 (SOAP and WSDL)
    - rejecting message, 104–105 (SOAP and WSDL)
  - SOAP faults, 111–112 (SOAP and WSDL)
  - recycleNode() method, 371 (JAX-RPC)
  - References
    - local, 768–769 (Appndx)
    - remote, 768 (Appndx)
    - RPC/Encoded messaging, 767–769 (Appndx)
    - simple types, 769 (Appndx)
  - RegistryException types, 496 (JAXR)
  - RegistryObject interface, 501–504 (JAXR), 508–509 (JAXR), 535 (JAXR), 551 (JAXR), 563–564 (JAXR)
  - RegistryObject object, 577 (JAXR)
  - RegistryObject type, 500 (JAXR), 503 (JAXR)
  - RegistryService interface, 489–491 (JAXR)
  - RegistryService object, 487–491 (JAXR), 494 (JAXR)
  - Regular expressions, 745 (Appndx)
    - absence of line anchors, 748 (Appndx)
    - allowed characters, 745–746 (Appndx)
    - character sets, 746 (Appndx)
    - ISBN (International Standard Book Number) example of, 748–749 (Appndx)
    - metacharacters, 747–748 (Appndx)
    - pattern facet, 745 (Appndx)
    - quantifiers, 745–748 (Appndx)
    - United Kingdom Postal Code example of, 749–750 (Appndx)
    - United States Phone Number example of, 749 (Appndx)
    - United States Zip Code example of, 749 (Appndx)
    - XML schemas, 745–750 (Appndx)
  - Regular expressions and XML schema, 66 (XML)
  - RelatedTo Concept, 572 (JAXR)
  - relationship tModel type, 191 (UDDI)
  - relationship UDDI type, 199 (UDDI)
  - Relationships, 573 (JAXR)
  - RELAX-NG, 78 (XML)
  - Remote interfaces, 315 (JAX-RPC)
  - Remote references, 768 (Appndx)
  - RemoteException exception, 316 (JAX-RPC), 318 (JAX-RPC), 413–415 (JAX-RPC)
  - removeAttribute() method, 301 (JAX-RPC)
  - removeChild() method, 649 (JAXP)
  - removeMimeHeader() method, 804 (Appndx)
  - replaceNode() method, 649 (JAXP)
  - Reply message, 109 (SOAP and WSDL)

- Request message, 109 (SOAP and WSDL)
  - Request/Response MEPs (messaging exchange patterns), 104 (SOAP and WSDL), 110–111 (SOAP and WSDL)
  - Request/Response messaging, 82 (SOAP and WSDL), 145–147 (SOAP and WSDL), 349 (JAX-RPC)
  - Request/Response operation style and generated stubs, 449 (JAX-RPC)
  - Request-response protocol, 120 (SOAP and WSDL)
  - Request/Response SOAP messages, 201 (UDDI)
  - Request/Response Web service and generated stubs, 337 (JAX-RPC)
  - Requires attribute, 673 (Deployment)
  - RequiresNew attribute, 673 (Deployment)
  - Resource APIs, accessing, 2 (Overview)
  - resource-ref element, 403 (JAX-RPC)
  - Resources
    - binding in directory structure, 287–293 (JAX-RPC)
    - transactions, 305–308 (JAX-RPC)
  - Responses in asynchronous messaging, 491 (JAXR)
  - Restriction, 60–61 (XML)
  - restriction element, 64 (XML)
  - result element, 834 (Appndx)
  - result type, 234 (UDDI)
  - Roles, 324 (JAX-RPC)
  - rollback() method, 308 (JAX-RPC)
  - Rolled back, 305 (JAX-RPC)
  - root element, 22 (XML), 50–51 (XML), 85 (SOAP and WSDL)
  - Rosettanet-org:PIP2A2:QueryProductInformation:v1.0 tModel, 194 (UDDI)
  - Rosettanet-org:PIP1A1:RequestAccountSetup:vB01.00.00A tModel, 194 (UDDI)
  - RPC messaging and SOAP Encoding, 755 (Appndx)
  - RPC (Remote Procedure Call) components, 308–310 (JAX-RPC)
  - RPC/Encoded messaging, 1 (Overview), 273–274 (JAX-RPC), 755
    - accessors, 757–758 (Appndx)
    - arbitrary accessor names, 758 (Appndx)
    - array of complex types and other arrays, 764–765 (Appndx)
    - Array type attribute, 761 (Appndx), 763 (Appndx)
    - array types, 761 (Appndx)
    - complex type accessor, 757–758 (Appndx)
    - complex types, 760–761 (Appndx)
    - href attribute, 768 (Appndx)
    - multi-dimensional arrays, 765 (Appndx)
    - multiple parameters, 760–761 (Appndx)
    - operation structs, 756–759 (Appndx)
    - polymorphic array, 763–764 (Appndx)
    - references, 767–769 (Appndx)
    - simple types, 759 (Appndx)
    - XSI type declarations, 759 (Appndx)
  - RPC/Encoded SOAP 1.1 messaging over HTTP 1.1, 347 (JAX-RPC)
  - RPC/Encoded SOAP request message, 756 (Appndx)
  - RPC/Literal MEPS (messaging exchange patterns), 110–111 (SOAP and WSDL)
  - RPC/Literal messaging, 347 (JAX-RPC), 349 (JAX-RPC)
  - RPC/Literal mode, 108–110 (SOAP and WSDL)
  - RPC/Literal SOAP request message, 109 (SOAP and WSDL)
  - RPC/Literal SOAP response message, 109 (SOAP and WSDL)
  - RPC-style messages, 144 (SOAP and WSDL), 155–156 (SOAP and WSDL)
  - RPC-style Web services, 138–139 (SOAP and WSDL)
  - run-as security identity, 675–676 (Deployment)
  - Runtime error and message handlers, 415 (JAX-RPC)
- S**
- SAAJ 1.2 and DOM 2, 390–392 (JAX-RPC)
  - SAAJ messages and attachments, 783–785 (Appndx)
  - SAAJ (SOAP with Attachments API for Java), 11 (Overview), 129 (SOAP and WSDL), 781 (Appndx)
  - Abstract Factory Pattern, 354 (JAX-RPC)
  - accessing and modifying SOAP message, 400 (JAX-RPC)
  - accessing representation of SOAP message, 325 (JAX-RPC)
  - API-based SOAP toolkit, 353 (JAX-RPC)
  - building fault messages, 384–385 (JAX-RPC)
  - converting Java objects, 783 (Appndx)
  - example, 355–356 (JAX-RPC)
  - interfaces to construct SOAP document, 363–382 (JAX-RPC)
  - JAF, 793–803 (Appndx)
  - Java, 354 (JAX-RPC)
  - JAX-RPC Message Handler API, 353 (JAX-RPC)
  - manipulating SOAP messages, 354 (JAX-RPC)
  - message-delivery system, 388 (JAX-RPC)
  - network communication, 354 (JAX-RPC)
  - Request/Response style SOAP messages, 388 (JAX-RPC)
  - sending SOAP messages, 388–389 (JAX-RPC)
  - SOAP faults, 382–388 (JAX-RPC)
  - SOAP messages, 356–363 (JAX-RPC)
  - SwA messages, 357 (JAX-RPC), 793 (Appndx)
  - vendor implementation, 354 (JAX-RPC)
  - W3C DOM (Document Object Model) version 2, 354 (JAX-RPC)
  - SaajExample\_2 listing, 359 (JAX-RPC)
  - SaajExample\_F1 class, 793–794 (Appndx)
  - SaajExample\_F2 file, 801–803 (Appndx)
  - SaajOutputter classes, 360 (JAX-RPC)
  - SAP, 166 (UDDI), 478 (JAXR)
  - Save operations, 233 (UDDI)
    - add\_publisherAssertions operation, 245–246 (UDDI)

- save\_binding operation, 242–243 (UDDI)
- save\_business operation, 239–241 (UDDI)
- save\_service operation, 241–242 (UDDI)
- save\_tModel operation, 243–245 (UDDI)
- set\_publisherAssertions operation, 246–247 (UDDI)
- SOAP request messages, 238–239 (UDDI)
- SOAP response messages, 238–239 (UDDI)
- saveAssociations() method, 600 (JAXR)
- save\_binding operation, 238 (UDDI), 242–243 (UDDI), 600 (JAXR)
- save\_business operation, 238–241 (UDDI), 600 (JAXR)
- saveClassificationSchemes() method, 600 (JAXR)
- saveConcepts() method, 600 (JAXR)
- SaveException type, 496 (JAXR), 498 (JAXR)
- saveOrganizations() method, 495 (JAXR), 498 (JAXR), 599–600 (JAXR)
- save\_service operation, 238 (UDDI), 241–242 (UDDI), 600 (JAXR)
- saveServiceBindings() method, 600 (JAXR)
- saveServices() method, 600 (JAXR)
- save\_tModel operation, 238 (UDDI), 243–245 (UDDI), 600 (JAXR)
- saveXXX() method, 492 (JAXR), 495 (JAXR)
- SAX parsers, 605–608 (JAXP), 619–621 (JAXP)
- SAX2 parsers, 25–26 (XML)
- SAX (Simple API for XML)
  - event-based architecture, 605 (JAXP)
  - general-purpose application for testing ContentHandler types, 610–611 (JAXP)
  - listener interfaces, 605 (JAXP)
- SAX2 (Simple API for XML, version 2), 12 (Overview)
  - ContentHandler interface, 608–621 (JAXP)
  - DefaultHandler interface, 608–621 (JAXP)
  - validating W3C XML Schema, 623–624 (JAXP)
- SAX (Simple API for XML) parser API, 25 (XML)
- SAXSource type, 804, 807 (Appndx)
- Schema documents, 36 (XML)
- schema element, 36 (XML), 49 (XML)
- schemaLocation attribute, 55 (XML)
- Schemas, 20 (XML), 35 (XML)
  - abstract base types, 61–63 (XML)
  - assigning, 55–57 (XML)
  - case sensitivity of types, 43 (XML)
  - complex types, 39–49 (XML)
  - declaring global elements, 49–52 (XML)
  - derived simple types, 65 (XML)
  - elements in random order, 48–49 (XML)
  - importing, 72–75 (XML)
    - including, 75 (XML)
  - Internet, 57 (XML)
  - locating, 55–57 (XML)
  - Monson-Haefel Markup language, 35 (XML)
  - multiple locations, 56 (XML)
  - pointing to on local file system, 57 (XML)
  - polymorphism, 61–63 (XML)
  - validating
    - different kinds of documents, 51 (XML)
    - XML documents against, 55 (XML)
      - as XML documents, 35 (XML)
- Schematron, 78 (XML)
- Schematron Web site, 78 (XML)
- Search criteria and findXXX() methods, 586–595 (JAXR)
- Search elements, 205 (UDDI)
- sec:Signature header blocks, 689 (Deployment)
- Security
  - HTTP, 124 (SOAP and WSDL)
  - roles, 324 (JAX-RPC)
- Security API, 2 (Overview)
- security-identity element, 676–677 (Deployment)
- Self-organizing systems, 167 (UDDI)
- Sender, 95 (SOAP and WSDL)
- sequence elements, 41 (XML), 48 (XML)
- Serializing programing-language structures into XML, 755–769 (Appndx)
- Server fault, 120 (SOAP and WSDL)
- Server fault code, 114–115 (SOAP and WSDL), 265 (UDDI)
- ServerSecurityHandler message handler, 409–411 (JAX-RPC), 701–703 (Deployment)
- Server-side components, 11 (Overview)
  - service element, 129–131 (SOAP and WSDL), 142 (SOAP and WSDL), 161–162 (SOAP and WSDL), 428 (JAX-RPC), 659–660 (Deployment), 682 (Deployment)
- Service interface, 331–332 (JAX-RPC), 545 (JAXR), 550–551 (JAXR)
  - definition of, 402–403 (JAX-RPC), 680–681 (Deployment)
  - generated by JAX-RPC compiler, 278 (JAX-RPC)
  - generic, 343 (JAX-RPC)
- Service objects, 508 (JAXR), 543–544 (JAXR)
  - adding Classification objects, 551 (JAXR)
  - creation of, 548–549 (JAXR), 567–568 (JAXR)
  - finding, 531 (JAXR)
  - matching criteria, 597 (JAXR)
  - multiple language-specific names and descriptions, 551 (JAXR)
  - searching for, 587–588 (JAXR), 589–590 (JAXR)
- Service reference element, 333–334 (JAX-RPC)
- Service type, 346–347 (JAX-RPC), 503 (JAXR)
- ServiceBinding interface, 551–553 (JAXR)
- ServiceBinding objects, 545–553 (JAXR)
  - associating Concept object with, 564–570 (JAXR)
  - collection, 550–551 (JAXR)
  - creation of, 549–550 (JAXR), 567–568 (JAXR)
  - finding, 531 (JAXR)
  - managing, 551 (JAXR)
  - matching criteria, 598 (JAXR)
  - owned by another organization, 552–553 (JAXR)
  - searching for, 587–590 (JAXR)

- ServiceBinding type, 12 (Overview), 503 (JAXR)
- ServiceBinding.createServiceBinding() method, 549–550 (JAXR)
- Service.createCall() method, 831 (Appndx)
- service-endpoint element, 698 (Deployment)
- ServiceEndpointContext, 423–424 (JAX–RPC)
- service-endpoint-interface element, 697–698 (Deployment), 730 (Deployment)
- service-endpoint-interface-mapping element, 728–734 (Deployment)
- ServiceFactory.loadService() method, 337 (JAX–RPC)
- Service.getPort() method, 342 (JAX–RPC), 683–685 (Deployment)
- service-impl-bean element, 698–700 (Deployment)
- service-interface element, 680–681 (Deployment)
- service-interface-mapping element, 725–728 (Deployment)
- ServiceLifecycle interface, 293–302 (JAX–RPC)
- service-qname element, 340 (JAX–RPC), 681–683 (Deployment)
- service-ref descriptor element, 403–404 (JAX–RPC)
- service-ref element, 334 (JAX–RPC), 340 (JAX–RPC), 347 (JAX–RPC), 677–679 (Deployment), 682 (Deployment)
- declaring message handlers, 686 (Deployment)
- declaring multiple message handlers, 407–408 (JAX–RPC)
- display elements, 685 (Deployment)
- handler element, 685–691 (Deployment)
- mandatory elements, 679 (Deployment)
- processing message handlers, 690–691 (Deployment)
- service-ref-name element, 679–680 (Deployment)
- Services, 331–332 (JAX–RPC)
- /services subcontext, 289 (JAX–RPC)
- SERVICE\_SUBSET constant, 593 (JAXR)
- serviceSubset qualifier, 213–214 (UDDI)
- Servlet container, 285 (JAX–RPC)
- authentication, 297 (JAX–RPC)
- interfaces, 300 (JAX–RPC)
- JSE instances, 293 (JAX–RPC)
- Servlet Context interface, 668 (Deployment)
- servlet-class element, 666 (Deployment)
- ServletContext interface, configuring, 667–668 (Deployment)
- ServletContext object, 300–301 (JAX–RPC)
- ServletContext.getInitParameter() method, 668 (Deployment)
- ServletEndpointContext interface, 293–302 (JAX–RPC)
- ServletEndpointContext type, 424 (JAX–RPC)
- servlet-link element, 698–699 (Deployment)
- Servlets
  - describing runtime attributes, 665–672 (Deployment)
  - generated stubs, 333 (JAX–RPC)
  - JSEs (JAX–RPC service endpoints), 285–287 (JAX–RPC)
  - JSPs (JavaServer Pages), 287 (JAX–RPC)
  - processing HTTP requests as input and output streams, 285 (JAX–RPC)
  - simplicity, 285 (JAX–RPC)
- SessionBean interface, 318 (JAX–RPC), 321–323 (JAX–RPC)
- SessionContext interface, 323–326 (JAX–RPC), 424 (JAX–RPC)
- SessionContext.getMessageContext() method, 325–326 (JAX–RPC)
- SessionContext.getRollbackOnly() method, 325 (JAX–RPC)
- SessionContext.getTimerService() method, 326 (JAX–RPC)
- SessionContext.getUserTransaction() method, 325 (JAX–RPC)
- setAccessURI() method, 552 (JAXR)
- setAttribute() method, 301 (JAX–RPC)
- setAttributeXXX() methods, 645 (JAXP)
- setContent() method, 795–798 (Appndx), 803 (Appndx)
- setContentTypes() method, 804 (Appndx)
- setDataHandler() method, 795–798 (Appndx)
- setDescription() method, 564 (JAXR)
- setDocumentLocator() method, 621 (JAXP)
- setFaultCode() method, 385 (JAX–RPC)
- setFaultString() method, 386 (JAX–RPC)
- setFeature() method, 624 (JAXP)
- setHandlerClass() method, 420 (JAX–RPC)
- setHandlerConfig() method, 420 (JAX–RPC)
- setHeaders() method, 420 (JAX–RPC)
- setKey() method, 564 (JAXR)
- setMimeHeader() method, 804 (Appndx)
- setName() method, 511 (JAXR), 564 (JAXR)
- setNamespaceAware() method, 636 (JAXP)
- setNodeValue() method, 632–634 (JAXP)
- setNumber() method, 523 (JAXR)
- setPrefix() method, 634–636 (JAXP)
- setPrimaryContact() method, 508 (JAXR), 521 (JAXR)
- setProperty() method, 362 (JAX–RPC), 624 (JAXP), 833
- set\_publisherAssertions operation, 238 (UDDI), 246–247 (UDDI), 600 (JAXR)
- setRollbackOnly() method, 325 (JAX–RPC)
- setSessionContext() method, 319 (JAX–RPC), 322–323 (JAX–RPC)
- setSpecificationObject() method, 568–569 (JAXR)
- setTargetBinding() method, 552 (JAXR)
- setType() method, 523 (JAXR)
- setValidateURI() method, 550 (JAXR)
- setValidationURI() method, 558 (JAXR)
- setValue() method, 371–372 (JAX–RPC), 378 (JAX–RPC)
- shipAddress element, 41 (XML), 43 (XML), 61–62 (XML)
- Shipping type, 35 (XML)
- short type, 38 (XML)
- Siblings and nodes, 639 (JAXP)

- Signature object, 421 (JAX-RPC), 687 (Deployment), 703 (Deployment)
- signatureComponent tModel type, 192 (UDDI)
- Simple types, 35–39 (XML), 43 (XML)
  - atomic, 36 (XML)
  - defining, 64 (XML)
  - inheritance, 64–68 (XML)
  - references, 769
  - restricting range, 66–67 (XML)
  - restricting to distinct values, 68 (XML)
  - restriction element, 64 (XML)
  - RPC/Encoded messaging, 759 (Appndx)
  - XML Schema-Instance, 759 (Appndx)
- SimpleHandler class, 609–610 (JAXP)
- simpleType schema element, 64 (XML)
- Single-threaded programming model, 302–303 (JAX-RPC)
- SingleThreadModel interface, 303 (JAX-RPC)
- skippedEntity() method, 621 (JAXP)
- Slot interface, 577–578 (JAXR)
- Slot objects, 526 (JAXR), 577 (JAXR)
- SMTP (Simple Mail Transfer Protocol), 772–773 (Appndx)
  - SOAP messages, 82 (SOAP and WSDL), 124 (SOAP and WSDL)
- SOAP 1.1, 81 (SOAP and WSDL)
  - encoding namespace constants, 352 (JAX-RPC)
  - envelope namespace, 89 (SOAP and WSDL)
  - namespace and constants, 378 (JAX-RPC)
  - QName constant values for types, 350 (JAX-RPC)
  - role and node, 118 (SOAP and WSDL)
  - SOAP Encoding, 755 (Appndx)
  - XML schema, 86 (SOAP and WSDL)
- SOAP 1.2, 84 (SOAP and WSDL), 122 (SOAP and WSDL)
- SOAP APIs and Web service clients, 129 (SOAP and WSDL)
- SOAP applications
  - exchanging messages between, 95 (SOAP and WSDL)
  - reporting errors to nodes, 111–120 (SOAP and WSDL)
- SOAP attachments and generated stub, 815 (Appndx)
- SOAP clients
  - authenticating, 324 (JAX-RPC)
  - identity of, 297 (JAX-RPC)
  - security identity, 324 (JAX-RPC)
  - WSDL document associated with EJB endpoint, 316 (JAX-RPC)
- SOAP documents
  - MIME headers, 358 (JAX-RPC)
  - non-XML data, 781 (Appndx)
  - root, 364 (JAX-RPC)
  - SAAAJ interfaces to create, 363–382 (JAX-RPC)
  - XML namespaces, 366 (JAX-RPC)
- SOAP elements and XML namespaces, 84–85 (SOAP and WSDL)
- SOAP Encoding, 755 (Appndx), 759 (Appndx)
- SOAP Encoding type, 352 (JAX-RPC)
- SOAP envelope. *See* SOAP messages (SOAP and WSDL)
- SOAP Factory class, 808 (Appndx)
- SOAP fault messages, 264–268 (UDDI), 384 (JAX-RPC), 618 (JAXP)
- SOAP faults, 103 (SOAP and WSDL), 111–112 (SOAP and WSDL), 379 (JAX-RPC), 414–415 (JAX-RPC)
  - JAX-RPC servlet, 285 (JAX-RPC)
  - SAAJ, 382–388 (JAX-RPC)
- SOAP handlers and roles, 704–705 (Deployment)
- SOAP header blocks, manipulating, 281 (JAX-RPC)
- SOAP intermediaries, 96 (SOAP and WSDL)
- SOAP messages, 8 (Overview), 81 (SOAP and WSDL), 279 (JAX-RPC)
  - accessing
    - MIME part, 361–362 (JAX-RPC)
    - SAAJ representation of, 325 (JAX-RPC)
  - adding
    - header blocks, 101 (SOAP and WSDL), 372–375 (JAX-RPC)
    - message-id header block, 397–400 (JAX-RPC)
  - after header blocks are processed, 101–102 (SOAP and WSDL)
  - application-specific data, 106 (SOAP and WSDL)
  - attaching binary data, 9 (Overview)
  - attachments, 783 (Appndx)
    - sent over HTTP, 776–778 (Appndx)
  - based on RPC/Encoded messaging, 755–769 (Appndx)
  - basic structure, 84–88 (SOAP and WSDL)
  - body, 106–107 (SOAP and WSDL)
  - Body element, 106–107 (SOAP and WSDL)
  - building from scratch, 11 (Overview)
  - Claim header block, 105 (SOAP and WSDL)
  - conformance header block, 105 (SOAP and WSDL)
  - conforming to UDDI 2.0 Programming API, 202 (UDDI)
  - constructing, 282 (JAX-RPC)
  - construction of, 758 (Appndx)
  - declaring
    - correct style, 154 (SOAP and WSDL)
    - SOAPAction header field, 153–154 (SOAP and WSDL)
  - delivering, 120 (SOAP and WSDL)
  - different code libraries to process, 92 (SOAP and WSDL)
  - documentation, 127 (SOAP and WSDL)
  - ds:Signature header block, 689–690 (Deployment)
  - embedding binary data using Base64, 779 (Appndx)
  - encoding style, 756 (Appndx)
  - error generated by receiver while processing, 382–386 (JAX-RPC)
  - exchanging with
    - remote Web service endpoints, 277 (JAX-RPC)
    - Web services, 129 (SOAP and WSDL)
  - fault messages, 112–113 (SOAP and WSDL)
  - faults, 106 (SOAP and WSDL)

- SOAP messages, (*cont.*)
  - flexibility, 86 (SOAP and WSDL)
  - format defined by XML
    - schmema, 83 (SOAP and WSDL)
  - getBookQuote operation, 756–757 (Appndx)
  - handling different versions, 92 (SOAP and WSDL)
  - HTTP (Hypertext Transfer Protocol), 81–82 (SOAP and WSDL)
  - identity of application sending, 297 (JAX-RPC)
  - Image object, 783 (Appndx)
  - incorrect or could not be processed, 414–415 (JAX-RPC)
  - independently constructing portions, 380–382 (JAX-RPC)
  - information about, 86 (SOAP and WSDL)
  - initial sender, 95–96 (SOAP and WSDL)
  - input stream, 358–359 (JAX-RPC)
  - Internet protocol used to transport, 151–152 (SOAP and WSDL)
  - JAX-RPC servlet, 285 (JAX-RPC)
  - lack of line breaks and white space, 361 (JAX-RPC)
  - local elements namespace-qualified, 91 (SOAP and WSDL)
  - logging intermediary, 99 (SOAP and WSDL)
  - manipulating, 282 (JAX-RPC), 354 (JAX-RPC)
  - message path, 95–96 (SOAP and WSDL)
  - message-id header block, 92 (SOAP and WSDL), 405 (JAX-RPC)
  - modular code, 92–93 (SOAP and WSDL)
  - modularity, 92 (SOAP and WSDL)
  - modularizing construction, 382 (JAX-RPC)
  - multiple header blocks, 406–407 (JAX-RPC)
  - never sent, 413 (JAX-RPC)
  - no attachments added, 360–363 (JAX-RPC)
  - normal processing, 412 (JAX-RPC)
- One-Way messaging, 82 (SOAP and WSDL), 85 (SOAP and WSDL), 123 (SOAP and WSDL)
  - problems with, 114 (SOAP and WSDL)
  - protocols, 82 (SOAP and WSDL)
  - readability, 361 (JAX-RPC)
  - reading, 360 (JAX-RPC)
  - reading and manipulating, 11 (Overview)
  - receiver, 95 (SOAP and WSDL)
  - removing header, 362 (JAX-RPC)
- Request/Response messaging, 82 (SOAP and WSDL)
  - returning to client, 413 (JAX-RPC)
- SAAJ creation of, 356–363 (JAX-RPC)
  - sender, 95 (SOAP and WSDL)
  - sending and receiving with JAX-RPC, 811–829 (Appndx)
  - sending with SAAJ, 388–389 (JAX-RPC)
  - sent over HTTP, 120 (SOAP and WSDL)
- SMTP (Simple Mail Transfer Protocol), 82 (SOAP and WSDL), 124 (SOAP and WSDL)
- SOAP 1.1 XML schema, 86 (SOAP and WSDL)
- TCP/IP, 124 (SOAP and WSDL)
- transmitting with HTTP POST messages, 121–123 (SOAP and WSDL)
- types of Java objects attachable, 789 (Appndx)
- UDDI, 201–203 (UDDI), 484 (JAXR)
  - ultimate receiver, 96 (SOAP and WSDL)
  - unique identifiers, 86–87 (SOAP and WSDL)
  - writing to output stream, 361 (JAX-RPC)
  - wrong root element, 116 (SOAP and WSDL)
- XML
  - address information, 8 (Overview)
  - declarations, 85 (SOAP and WSDL)
  - digital signature, 406 (JAX-RPC)
  - namespaces, 88–90 (SOAP and WSDL), 617–620 (JAXP)
    - xsi:schemaLocation attribute, 91 (SOAP and WSDL)
- SOAP Messages with Attachments, 1 (Overview)
- SOAP namespace, 756 (Appndx)
- SOAP nodes, 96 (SOAP and WSDL)
- SOAP replies, 409 (JAX-RPC)
- SOAP reply messages, 138–139 (SOAP and WSDL), 412 (JAX-RPC)
- SOAP Reply over HTTP, 122–123 (SOAP and WSDL)
- SOAP request messages, 409 (JAX-RPC), 412 (JAX-RPC), 642 (JAXP)
  - describing payload, 138–139 (SOAP and WSDL)
  - get operations, 224–225 (UDDI)
  - save operations, 238–239 (UDDI)
- SOAP response messages, 238–239 (UDDI)
- SOAP RPC/Encoding arrays, 440 (JAX-RPC)
- SOAP senders, 297–300 (JAX-RPC)
- SOAP (Simple Object Access Protocol), 4 (Overview), 7 (Overview), 20 (XML), 33 (XML), 79 (SOAP and WSDL)
  - A2A (Application-to-Application) communication, 81 (SOAP and WSDL)
  - acceptance of, 83–84 (SOAP and WSDL)
  - backward-compatibility, 387 (JAX-RPC)
  - basic structure, 84–88 (SOAP and WSDL)
  - B2B (Business-to-Business), 81 (SOAP and WSDL)
  - binding, 151 (SOAP and WSDL)
  - binding and assigning Internet address, 162 (SOAP and WSDL)
  - as de facto standard protocol for A2A messaging, 84 (SOAP and WSDL)
  - defining array data types, 135–136 (SOAP and WSDL)
  - describing XML data structure, 9 (Overview)
  - Document/Encoded messaging mode, 111 (SOAP and WSDL)

- Document/Literal mode, 107–108 (SOAP and WSDL)
- EAI (Enterprise Application Integration), 81 (SOAP and WSDL)
- encoding, 111 (SOAP and WSDL)
- exchanging binary data, 771 (Appndx)
- exchanging data over networks, 81 (SOAP and WSDL)
- explicit definition of HTTP binding, 83 (SOAP and WSDL)
- extending, 106 (SOAP and WSDL)
- extensibility, 83 (SOAP and WSDL), 89 (SOAP and WSDL)
- fault messages, 111–120 (SOAP and WSDL)
- firewalls, 124 (SOAP and WSDL)
- flexibility, 89 (SOAP and WSDL)
- headers, 95–106 (SOAP and WSDL), 106 (SOAP and WSDL)
- interoperability, 7–9 (Overview)
- messaging modes, 107–111 (SOAP and WSDL)
- MIME message format, 353 (JAX-RPC)
- MIME (Multipurpose Internet Mail Extensions), 775–778 (Appndx)
- namespaces, 88–96 (SOAP and WSDL)
- non-standard fault codes, 116–117 (SOAP and WSDL)
- over HTTP, 120–124 (SOAP and WSDL)
- pass-by-reference, 276 (JAX-RPC)
- payloads, 234 (UDDI)
- RPC (Remote Procedure Call) components, 309 (JAX-RPC)
- RPC/Encoded messaging mode, 111 (SOAP and WSDL)
- RPC/Literal mode, 108–110 (SOAP and WSDL)
- transferring binary data over, 151 (SOAP and WSDL)
- variety of messaging systems, 95 (SOAP and WSDL)
- versions, 9 (Overview), 89 (SOAP and WSDL)
- Web services, 127 (SOAP and WSDL)
- XML namespaces, 8 (Overview)
- XML schemas, 8 (Overview)
- SOAP stacks, 91 (SOAP and WSDL)
- SOAP toolkit reporting errors, 379–380 (JAX-RPC)
- SOAP toolkits
  - CIDs (content-ids), 778 (Appndx)
  - elements reflecting arguments' types, but not names, 758 (Appndx)
  - stub-based, 758 (Appndx)
- SOAP XML document instance, 81 (SOAP and WSDL)
- soapAction attribute, 153 (SOAP and WSDL)
- SOAPAction header, 121–122 (SOAP and WSDL), 152–155 (SOAP and WSDL), 202 (UDDI)
- soap:address element, 331 (JAX-RPC)
- SOAP-based Web service operations, 201 (UDDI)
- SOAP-based Web services
  - fault messages, 141 (SOAP and WSDL)
  - UDDI registry, 166 (UDDI)
- soapbind:address element, 162 (SOAP and WSDL)
- soapbind:binding element, 149–150 (SOAP and WSDL)
- soapbind:body element, 149–150 (SOAP and WSDL), 155–156 (SOAP and WSDL)
- soapbind:fault element, 156–157 (SOAP and WSDL)
- soapbind:header element, 157–159 (SOAP and WSDL)
- soapbind:headerfault element, 159–161 (SOAP and WSDL)
- soapbind:operation element, 149 (SOAP and WSDL), 152–155 (SOAP and WSDL)
- SOAPBody element, 361 (JAX-RPC), 391 (JAX-RPC)
- soap:Body element, 644 (JAXP)
- soap:body element, 814 (Appndx)
- SOAPBody type, 376–377 (JAX-RPC)
- SOAPBody.addDocument() method, 392 (JAX-RPC)
- SOAPBodyElement type, 377–378 (JAX-RPC)
- SOAPConnection object, 389 (JAX-RPC)
- SOAPConnection.call() method, 389 (JAX-RPC)
- SOAPConstants class, 378–379 (JAX-RPC)
- SOAPElement element
  - creation independent of context, 380–382 (JAX-RPC)
  - extending, 377–378 (JAX-RPC)
- SOAPElement interface, 808 (Appndx)
- SOAPElement objects, 376 (JAX-RPC)
- SOAPElement type, 364–370 (JAX-RPC), 380–382 (JAX-RPC), 446–451 (JAX-RPC)
  - definition of, 368 (JAX-RPC)
  - header blocks, 370 (JAX-RPC)
  - JAX-RPC non-standard XML Schema type, 445–446 (JAX-RPC)
  - mapping xsd:any type to, 450–451 (JAX-RPC)
  - methods, 368 (JAX-RPC)
  - for non-standard type in Document/Literal messaging, 447–448 (JAX-RPC)
- SOAPElement.addChildElement() method, 370 (JAX-RPC)
- soap:encodingStyle attribute, 756 (Appndx)
- soap:Envelope element, 644 (JAXP)
- SOAPEnvelope interface, 807–809
- SOAPEnvelope type, 363–364 (JAX-RPC)
- SOAPException class, 379–380 (JAX-RPC)
- SOAPException exception, 356 (JAX-RPC), 389 (JAX-RPC), 399 (JAX-RPC), 808 (Appndx)
- SOAPFactory class, 364–367 (JAX-RPC), 380–382 (JAX-RPC)
- SOAPFactory object, 365 (JAX-RPC)
- SOAPFault type, 377 (JAX-RPC), 382–386 (JAX-RPC)
- SOAPFaultElement type, 387 (JAX-RPC)
- SOAPFaultException exception, 414–415 (JAX-RPC)
- SOAPHeader element, 361 (JAX-RPC)
- soap-header element, 688 (Deployment), 703–705 (Deployment)
- SOAPHeader object, 371 (JAX-RPC)

- SOAPHeader type, 372–375 (JAX-RPC)
- SOAPHeader.addChildElement(), 373 (JAX-RPC)
- SOAPHeaderElement object, 375 (JAX-RPC)
- SOAPHeaderElement type, 375–376 (JAX-RPC)
- soap:isbn Element, 645 (JAXP)
- SOAPMessage, 354 (JAX-RPC)
- SOAPMessage class, 360–363 (JAX-RPC), 795 (Appndx)
- SOAPMessage object, 356 (JAX-RPC), 358 (JAX-RPC), 389 (JAX-RPC), 422 (JAX-RPC)
  - importing DOM element into, 391 (JAX-RPC)
  - moving DOM root element, 392 (JAX-RPC)
  - root element is physically reassigned to, 392 (JAX-RPC)
  - standard and vendor-specific properties, 362–363 (JAX-RPC)
- SOAPMessageContext class, 422–423 (JAX-RPC)
- SOAPMessageContext object, 422 (JAX-RPC), 424 (JAX-RPC)
- SOAPMessage.getSOAPPart() method, 363 (JAX-RPC)
- SOAPMessage.writeTo() method, 360 (JAX-RPC)
- SOAPPart object, 803–804 (Appndx)
- SOAPPart type, 354 (JAX-RPC), 363–364 (JAX-RPC), 391 (JAX-RPC)
- soap-role elements, 688–690 (Deployment), 704–705 (Deployment)
- soapSpec tModel type, 192 (UDDI)
- SOAP-specific protocol elements, 148–149 (SOAP and WSDL)
- SOAP-WSDL binding namespaces, 149 (SOAP and WSDL)
- soap.xml file, 358–359 (JAX-RPC)
- Solicit/Response messaging, 147–148 (SOAP and WSDL)
- sopabind:binding element, 151–152 (SOAP and WSDL)
- SORT\_BY\_DATE\_ASC constant, 593 (JAXR)
- sortByDateAsc qualifier, 212 (UDDI)
- SORT\_BY\_DATE\_DESC constant, 593 (JAXR)
- sortByDateDesc qualifier, 213 (UDDI)
- SORT\_BY\_NAME\_ASC constant, 593 (JAXR)
- sortByNameAsc qualifier, 212 (UDDI)
- SORT\_BY\_NAME\_DESC constant, 592–593 (JAXR)
- sortByNameDesc qualifier, 212 (UDDI)
- Source interface, 805 (Appndx)
- sourceElement element, 651 (JAXP)
- Sparse arrays, 766 (Appndx)
- specification tModel type, 187 (UDDI), 191 (UDDI)
- specification UDDI type, 186 (UDDI)
- SpecificationLink interface, 569–570 (JAXR)
- SpecificationLink object, 564–570 (JAXR)
- SpecificationLink type, 503 (JAXR)
- specifications criteria, 589–590 (JAXR)
- SQLException exception, 308 (JAX-RPC)
- SSL (Secure Sockets Layer), 298 (JAX-RPC)
- Stack variable, 620 (JAXP)
- Standard header blocks, 106 (SOAP and WSDL)
- Standard Holder types, 462–463 (JAX-RPC)
- Standard role types, 102 (SOAP and WSDL)
- start parameter, 778 (Appndx)
- Start tag, 17 (XML), 21 (XML)
- startDocument() method, 605 (JAXP), 612 (JAXP)
- startElement() method, 605 (JAXP), 609–610 (JAXP), 612–620 (JAXP), 619 (JAXP), 620 (JAXP)
- startPrefixMapping() method, 617–620 (JAXP)
- state element, 34 (XML), 39 (XML), 45 (XML), 49 (XML), 59–60 (XML), 742
- Stateful session bean, 310 (JAX-RPC), 319 (JAX-RPC)
- Stateless session beans
  - accessing entity beans, 309–310 (JAX-RPC)
  - callback methods, 318 (JAX-RPC)
- EJB (Enterprise JavaBeans)
  - endpoints, 276 (JAX-RPC)
- ejbCreate() method, 319 (JAX-RPC)
- events in life cycle, 321–323 (JAX-RPC)
- life cycle, 321–322 (JAX-RPC)
- SessionBean interface, 321–323 (JAX-RPC)
- Web service endpoint interface, 275 (JAX-RPC)
- Web service endpoints, 315–326 (JAX-RPC)
- Statelessness and message handlers, 416–417 (JAX-RPC)
- status:complete completion status code, 255 (UDDI)
- status:fromKey\_incomplete completion status code, 256 (UDDI)
- status:toKey\_incomplete completion status code, 256 (UDDI)
- stopElement() method, 619 (JAXP)
- StreamSource type, 804–806 (Appndx)
- street element, 31 (XML), 34 (XML), 39 (XML), 45 (XML), 49 (XML), 59–60 (XML), 60 (XML)
- string element, 763 (Appndx)
- String methods, 386 (JAX-RPC)
- string type, 37–38 (XML), 66 (XML), 68 (XML)
- StringBuffer, 619–620 (JAXP)
- StringWriter, 648 (JAXP)
- Stub-based SOAP toolkit, 758 (Appndx)
- Stub-based toolkits, 755 (Appndx)
- style attribute, 152–153 (SOAP and WSDL)
- SubmitBook endpoint stub, 817 (Appndx)
- submitPurchaseOrder() method, 444–445 (JAX-RPC)
- SubmitPurchaseOrder Web Service, 139 (SOAP and WSDL)
- Subscribers, 147 (SOAP and WSDL)
- Substitution group, 63 (XML)
- Sun, 165 (UDDI)
- Sun Microsystems Java Servlet home page, 669 (Deployment)
- Sun Microsystems Web site, 499 (JAXR)
- Supports attribute, 673 (Deployment)

- SVG, 19 (XML)
- SwA messages
  - as always SOAP message, 814 (Appndx)
  - Base64 encoding, 779 (Appndx)
  - complete, 801–803 (Appndx)
  - mapping method calls to, 817–818 (Appndx)
  - root MIME part, 803–804 (Appndx)
  - SAAJ, 793 (Appndx)
  - sample, 800–801 (Appndx)
- SwA (SOAP Messages with Attachments), 9 (Overview), 80 (SOAP and WSDL), 281 (JAX-RPC), 353 (JAX-RPC)
  - building, 781–810 (Appndx)
  - input stream, 358–359 (JAX-RPC)
- JAX-RPC, 273–274 (JAX-RPC), 771
  - message example, 781–782 (Appndx)
  - MIME message format, 781 (Appndx)
  - MIME (Multipurpose Internet Mail Extensions), 772–778 (Appndx)
  - MIME standard, 151 (SOAP and WSDL)
  - Multipart/Related content type, 776 (Appndx)
  - root MIME part, 363–364 (JAX-RPC)
  - SAAJ (SOAP with Attachments API for Java), 771 (Appndx)
  - sending and receiving SOAP messages with JAX-RPC, 811–829 (Appndx)
- Symmetric HTTP, 297 (JAX-RPC), 324 (JAX-RPC)
- System class, 608 (JAXP)
- Systinet, 165 (UDDI)
- T**
- Tags, 17 (XML)
- targetBinding object, 552–553 (JAXR)
- targetBinding property, 553 (JAXR)
- targetNamespace attribute, 36 (XML), 133 (SOAP and WSDL), 135 (SOAP and WSDL)
- Tax identification number, 174 (UDDI)
- Taxonomies, 527 (JAXR)
  - external, 563 (JAXR)
  - external identifiers, 542–543 (JAXR)
  - internal, 560–563 (JAXR)
  - JAXR, 533 (JAXR)
  - specifications, 175 (UDDI)
  - tModel data structure as identifier, 189 (UDDI)
- TaxonomyBrowser, 562 (JAXR)
- TCP/IP and SOAP messages, 124 (SOAP and WSDL)
- Technical objects, 478 (JAXR)
- TelephoneNumber interface, 523–524 (JAXR)
- TelephoneNumber object, 523 (JAXR)
- Text. literal, 24 (XML)
- Text files, 171 (UDDI)
- Text messages, language of, 117 (SOAP and WSDL)
- Text object, 378 (JAX-RPC)
- Text type, 371 (JAX-RPC), 378 (JAX-RPC), 390 (JAX-RPC)
- text/plain MIME type, 817 (Appndx)
- text/xml Content-Type, 122 (SOAP and WSDL)
- text/xml MIME type, 820–822 (Appndx)
- text/xml or MIME type, 817 (Appndx)
- Thomas Register Supplier Identifier Code System, 175–176 (UDDI), 538–541 (JAXR), 542 (JAXR)
- thomasregister-com:supplierID UDDI standard tModel, 190 (UDDI)
- time type, 38 (XML)
- TimerService object, 326 (JAX-RPC)
- tModel data structures, 168 (UDDI), 225 (UDDI), 233 (UDDI), 553 (JAXR)
  - adding or updating, 243–245 (UDDI)
  - categorizations, 185–186 (UDDI)
  - definition of, 194 (UDDI)
  - identifying, 194–195 (UDDI)
  - invisible to find operations, 252–253 (UDDI)
  - listing controlled by requester, 261–263 (UDDI)
  - representing WSDL document, 185 (UDDI)
  - specifications, 175 (UDDI)
  - taxonomy for categorizing, 190–192 (UDDI)
  - as taxonomy identifiers, 189–190 (UDDI)
  - UDDI types, 185 (UDDI)
  - UUID, 194 (UDDI)
  - UUID key, 171 (UDDI)
  - WSDL binding represented by, 188 (UDDI)
  - WSDL documents, 187–188 (UDDI)
  - WS-I conformant, 187 (UDDI)
  - XML schema, 194–198 (UDDI)
- tModel data type, 192–193 (UDDI)
- tModel element, 249 (UDDI)
- tModel key and valid URI (Uniform Resource Identifier), 199 (UDDI)
- tModel tModel type, 191 (UDDI)
- tModel UDDI type, 186–187 (UDDI), 187 (UDDI)
- tModelBag search element, 205 (UDDI), 208 (UDDI), 215 (UDDI)
- tModelBag type, 209–210 (UDDI)
- tModel-based categorizations, 179 (UDDI)
- tModelInfos element, 261 (UDDI)
- tModelInstanceDetails element, 184–185 (UDDI), 208–209 (UDDI)
- tModelInstanceInfo element, 184–185 (UDDI), 564 (JAXR)
- tModelKey attribute, 175 (UDDI), 185 (UDDI), 189 (UDDI)
- tModelKey element, 208 (UDDI)
- tModels, 526 (JAXR)
  - BP-Compliant WSDL, 197–198 (UDDI)
  - categoryBag element, 198 (UDDI)
  - identifierBag element, 197 (UDDI)
  - WSDL-based Web service, 196–197 (UDDI)
- token type, 38 (XML), 69 (XML)
- total element, 64 (XML)
- Total simple type, 64 (XML)
- Total type, 65–66 (XML), 76 (XML)
- Transaction component model, 309 (JAX-RPC)
- Transaction methods, 306–307 (JAX-RPC)
- Transactional Connection object, 305 (JAX-RPC)
- Transactional resource API, 305 (JAX-RPC)

- Transactional systems and server-side component model, 309 (JAX-RPC)
  - Transactions
    - automatic management, 309 (JAX-RPC)
    - bean-managed, 325 (JAX-RPC)
    - committed, 305 (JAX-RPC)
    - container-managed, 325 (JAX-RPC)
    - declarative attributes, 672–674 (Deployment)
    - EJBs (Enterprise JavaBeans), 305–308 (JAX-RPC)
    - limiting scope, 672 (Deployment)
    - new, 311 (JAX-RPC)
    - nonexistent, 311 (JAX-RPC)
    - policies, 311 (JAX-RPC)
    - processing, 309 (JAX-RPC)
    - propagating, 311–312 (JAX-RPC), 673 (Deployment)
    - rolled back, 305 (JAX-RPC), 314 (JAX-RPC)
  - Transactions API, 2 (Overview)
  - transfer() method, 312 (JAX-RPC), 314 (JAX-RPC)
  - TransferAudit EJBs, 312 (JAX-RPC), 314 (JAX-RPC)
  - TRANSFER\_AUDIT table, 314 (JAX-RPC)
  - transport attribute, 152 (SOAP and WSDL)
  - transport tModel type, 192 (UDDI)
  - TrAX (Transformation API for XML), 805 (Appndx), 821 (Appndx)Tree, 625 (JAXP), 630–632 (JAXP)
  - truncation attribute, 215 (UDDI), 239 (UDDI)
  - type attribute, 140 (SOAP and WSDL), 830 (Appndx)
  - type property, 523 (JAXR)
  - Type-dependent properties, 632–634 (JAXP)
  - Types
    - anonymous, 70–72 (XML)
    - case-sensitivity, 43 (XML)
    - extending, 58–60 (XML)
    - final by restriction, 64 (XML)
    - importing from schemas, 72–75 (XML)
    - substitution group, 63 (XML)
  - types element, 129–130 (SOAP and WSDL), 134–136 (SOAP and WSDL), 139–141 (SOAP and WSDL), 428 (JAX-RPC), 445 (JAX-RPC)
  - declaring array of complex types, 439 (JAX-RPC)
  - XML Schema types defined in WSDL, 134–135 (SOAP and WSDL)
- ## U
- UBR operator sites, 481–482 (JAXR)
  - UBR operators, 235 (UDDI)
  - UBR Operators Council, 166 (UDDI)
  - UBR (UDDI Business Registry), 478 (JAXR)
    - authenticating to, 484–486 (JAXR)
    - categorizations, 179 (UDDI)
    - operator sites, 166 (UDDI), 478 (JAXR)
    - SOAP message containing keyed Reference values, 193 (UDDI)
    - test registry, 478 (JAXR)
    - URLs for calling Inquiry and Publisher operations, 202–203 (UDDI)
  - UDDI business entry, 504–516 (JAXR)
  - UDDI data structures, fetching, 204, 224–232 (UDDI)
  - UDDI Inquiry API
    - mapping JAXR to, 581–599 (JAXR)
    - Web service interface, 531 (JAXR)
  - UDDI Operator Site specification, 193 (UDDI)
  - UDDI operators, 214–215 (UDDI), 235 (UDDI)
  - UDDI Programming API, 201 (UDDI)
  - UDDI Publishing API, 494 (JAXR), 599–600 (JAXR)
  - UDDI registries, 10 (Overview), 165 (UDDI)
    - accessing, 11–12 (Overview)
    - adding
      - information objects, 495 (JAXR)
      - publisherAssertion data structures, 245–246 (UDDI)
    - adding or updating
      - bindingTemplate data structures, 242–243 (UDDI)
      - businessEntity data structures, 239–241 (UDDI)
      - businessService data structures, 241–242 (UDDI)
      - tModel data structures, 243–245 (UDDI)
    - authenticating to, 484–486 (JAXR)
    - binding, 182 (UDDI)
    - bindingTemplate entries whose tModels match query, 221–223 (UDDI)
    - browsing for businesses, 217–218 (UDDI)
    - BusinessQueryManager object, 530–531 (JAXR)
    - businessService entries, 220–221 (UDDI)
    - caching categorization codes, 193 (UDDI)
    - connecting to, 479–487 (JAXR)
    - custom classification systems, 533–534 (JAXR)
    - data field lengths, 200 (UDDI)
    - deleting
      - bindingTemplate data structures, 251–252 (UDDI)
      - businessEntity elements, 249–250 (UDDI)
      - businessService data structures, 250–251 (UDDI)
      - publisherAssertion data structures, 253–254 (UDDI)
    - divisions and departments for Web services, 198–199 (UDDI)
    - D-U-N-S Number Identification System, 175–176 (UDDI)
    - dynamic queries, 491 (JAXR)
    - enrolling, 235 (UDDI)
    - exceptions, 497 (JAXR)
    - external taxonomies, 563 (JAXR)
    - faux keys, 503 (JAXR)
    - finding data structures, 531 (JAXR)
    - general keyword categorizations, 180 (UDDI)
    - get operations, 224–232 (UDDI)
    - HTML viewing, 171–172 (UDDI)
    - individual or enterprise publishing Web services to, 168–180 (UDDI)
    - ISO 3166 Geographic Locator System, 178 (UDDI)
    - JAXR (Java API for XML Registries), 475–478 (JAXR), 499 (JAXR)

- limiting number of results
  - returned, 214 (UDDI)
- logging into, 235–237 (UDDI)
- manipulating, 490 (JAXR)
- modifying default matching behavior, 210–214 (UDDI)
- more concise searching of, 190 (UDDI)
- Organization object, 487–489 (JAXR)
- other categorizations, 178 (UDDI)
- private, 166 (UDDI), 485 (JAXR)
- public, 166 (UDDI)
- publishing information to, 485 (JAXR)
- querying, 204–224 (UDDI)
- RegistryObject interface, 501–504 (JAXR)
- relationships between business entities, 198–199 (UDDI)
- reporting first error, 268 (UDDI)
- representing, 489–491 (JAXR)
- requesting data structures by their unique identifiers, 224–238 (UDDI)
- retrieving information, 490 (JAXR)
- returning publisherAssertion entries, 259–261 (UDDI)
- saving
  - Concept object, 559 (JAXR), 574–575 (JAXR)
  - information objects to, 492 (JAXR)
- searching, 490 (JAXR)
  - for values by names, 207–208 (UDDI)
- sending explicit XML document fragment in SOAP message to, 491 (JAXR)
- SOAP fault messages, 264–268 (UDDI)
- SOAP-based Web services, 166 (UDDI)
- subset of all related businesses, 218–220 (UDDI)
- technical concepts, 185–198 (UDDI)
- terminating session, 237–238 (UDDI)
- Thomas Register Supplier Identifier Code System, 175–176 (UDDI)
- tModel data structures invisible to find operations, 252–253 (UDDI)
- tModel-based categorizations, 179 (UDDI)
- tModels matching request message, 223 (UDDI)
- types of categories, 182 (UDDI)
- UDDI Programming API, 201 (UDDI)
- UNSPSC (Universal Standard Products and Services Classification) category system, 177–178 (UDDI)
- updating
  - publisherAssertion data structures, 246–247 (UDDI)
- updating objects, 495 (JAXR)
- URLs for calling Inquiry and Publisher operations, 202–203 (UDDI)
- UUID (Universally Unique Identifier) keys, 199 (UDDI), 501–504 (JAXR)
- verifying URLs, 550 (JAXR)
- Web service port, 182 (UDDI)
- UDDI repositories and NAICS (North American Industry Classification System) category system, 176–177 (UDDI)
- UDDI SOAP messaging, 201–203 (UDDI)
- UDDI specification, 165–166 (UDDI)
- identifier systems, 175 (UDDI)
- standard SOAP messaging API, 193 (UDDI)
- UDDI standard tModels, 190 (UDDI)
- UDDI types, 185 (UDDI)
- UDDI (Universal Description, Discovery and Integration), 4 (Overview), 9–10 (Overview), 33 (XML), 163–165 (UDDI)
  - arbitrary meta-data, 577 (JAXR)
  - data structures, 477 (JAXR)
  - Document/Literal messages, 202 (UDDI)
  - fault messages with disposition Record element, 265–266 (UDDI)
  - mapping
    - BusinessQueryManager.findXXX() methods, 582 (JAXR)
    - data structures with JAXR object types, 500 (JAXR)
    - name of Concept object, 557 (JAXR)
  - personName element, 521 (JAXR)
  - postal addresses, 525 (JAXR)
  - primary contact, 508 (JAXR)
  - primary data structures, 167–168 (UDDI)
  - Publishing API, 233 (UDDI)
  - publishing Web service, 187 (UDDI)
  - SOAP messages, 484 (JAXR)
  - standard classifications, 527–534 (JAXR)
  - standard error codes, 266–268 (UDDI)
  - standard relationship types, 573 (JAXR)
  - standard SOAP fault codes, 264–265 (UDDI)
  - support for SOAP 1.1 over HTTP, 201 (UDDI)
  - tModel data structure, 526 (JAXR), 553 (JAXR)
  - UBR (UDDI Business Registry), 478 (JAXR)
  - UDDI-specific errors reported using SOAP fault messages, 265 (UDDI)
  - UTF-8, 201 (UDDI), 514 (JAXR)
  - versions, 9–10 (Overview), 168 (UDDI)
  - Web services, 201 (UDDI)
  - WS-I Basic Profile 1.0, 477 (JAXR)
  - XML types, 202 (UDDI)
- UDDI4J (UDDI for Java), 203 (UDDI)
- UDDI.org Web site, 10 (Overview), 165 (UDDI), 201 (UDDI), 217 (UDDI), 481 (JAXR)
- uddi-org:general-keywords UDDI standard tModel, 190 (UDDI)
- uddi-org:type tModel, 190–192 (UDDI)
- uddi-org:type UDDI standard tModel, 190 (UDDI)
- uddi-org:types taxonomy, 558 (JAXR)
- UDDI-SOAP messages general structure, 202 (UDDI)
- UKAddress type, 60 (XML)
- Ultimate receiver, 96 (SOAP and WSDL)
- ultimate receiver role, 100 (SOAP and WSDL)
- unchecked element, 675 (Deployment)

- unchecked method permission, 675 (Deployment)
  - Unchecked tModel data type, 192–193 (UDDI)
  - Understanding .NET* (Chappell), 166 (UDDI)
  - Unicode text, 18 (XML)
  - Union types, 68–70 (XML)
  - United Kingdom Postal Code regular expressions example, 749–750 (Appndx)
  - United States Phone Number regular expressions example, 749 (Appndx)
  - United States Zip Code regular expressions example, 749 (Appndx)
  - Universal Character Set, 37 (XML)
  - Unqualified elements, 52–55 (XML)
    - unsignedByte type, 38 (XML)
    - unsignedInt type, 38 (XML)
    - unsignedLong type, 38 (XML)
    - unsignedShort type, 37–38 (XML), 64 (XML)
  - UNSPSC (Universal Standard Products and Services Classification), 177–178 (UDDI), 527 (JAXR), 532 (JAXR), 559–560 (JAXR)
  - unspsc-org:unspsc UDDI standard tModel, 190 (UDDI)
  - Unsupported MIME types, 827 (Appndx)
  - unvalidatable tModel type, 192 (UDDI)
  - Updating information objects, 510 (JAXR)
  - URI specification, 28 (XML)
  - URI\_NS\_SOAP\_ENCODING constant, 379 (JAX-RPC)
  - URIs (Uniform Resource Identifiers), 28 (XML)
    - actor attribute, 98 (SOAP and WSDL)
    - constants, 350 (JAX-RPC)
    - UDDI operator, 214–215 (UDDI)
  - URLDataSource, 791 (Appndx)
  - URLs (Universal Resource Locators), 28–29 (XML)
  - URLType enumeration, 576 (JAXR)
  - urn:uddi-org:api\_v2 namespace, 202 (UDDI)
  - ur-type type, 764 (Appndx)
  - U.S. Census Bureau Web site, 177 (UDDI)
  - US Address Markup Language, 51 (XML)
  - USAddress type, 35 (XML), 39 (XML), 41 (XML), 43 (XML), 45 (XML), 58–60 (XML), 67–68 (XML), 174 (UDDI)
    - defined using all element, 49 (XML)
    - final by extension, 63 (XML)
    - redefining, 61 (XML)
  - use attribute, 48 (XML), 155 (SOAP and WSDL), 157 (SOAP and WSDL)
  - User information object, 520 (JAXR)
  - User methods, 508 (JAXR)
  - User objects, 508 (JAXR), 516–526 (JAXR)
  - User type, 503 (JAXR), 521 (JAXR)
    - user-caller-identity element, 676–677 (Deployment)
  - USERNAME\_PROPERTY authentication, 349 (JAX-RPC)
  - UserTransaction object, 325 (JAX-RPC)
  - UserTransaction.begin() method, 308 (JAX-RPC)
  - UserTransaction.commit() method, 308 (JAX-RPC)
  - UserTransaction.rollback() method, 308 (JAX-RPC)
  - useType attribute, 172 (UDDI), 511 (JAXR), 523 (JAXR)
  - USSStateOrZipUnion union type, 69 (XML)
  - USState class, 442 (JAX-RPC)
  - USState type, 68 (XML), 442 (JAX-RPC)
  - USStateList type, 69–70 (XML)
  - USStateOrZipUnion type, 70 (XML)
  - USZipCode type, 66–67 (XML), 69–70 (XML)
  - UTF-8, 201 (UDDI), 514 (JAXR)
  - UUID (Universally Unique Identifier)
    - classifications, 531–532 (JAXR)
    - globally unique, 503 (JAXR)
    - tModel data structure, 194 (UDDI)
  - UUID (Universally Unique Identifier) keys, 199 (UDDI), 501–504 (JAXR)
    - external identifiers, 538 (JAXR)
    - organizations, 567 (JAXR)
    - Web services, 551 (JAXR)
- ## V
- Validating parser reading DTD (Document Type Definition), 740 (Appndx)
  - value property, 514 (JAXR)
  - valueOf() method, 343 (JAX-RPC)
  - VersionMismatch fault code, 115–116 (SOAP and WSDL), 120 (SOAP and WSDL), 264 (UDDI)
  - Visual widgets, discovering, 783–792 (Appndx)
  - VMID class, 399 (JAX-RPC)
- ## W
- WAND, 533 (JAXR)
  - WAND categorization service, 193 (UDDI)
  - WAND taxonomy, 563 (JAXR)
  - WANDS categorization system, 179 (UDDI)
  - WAR (Web ARchive) files, 656–657 (Deployment), 663–665 (Deployment)
  - warning() method, 622 (JAXP)
  - W3C DOM (Document Object Model) version 2, 354 (JAX-RPC)
  - W3c Namespaces in XML* recommendation, 94 (SOAP and WSDL)
  - W3C Note *SOAP Messages With Attachments*, 282 (JAX-RPC)
  - W3C (World Wide Web Consortium), 7 (Overview)
  - W3C XML schema
    - built-in types, 134 (SOAP and WSDL)
    - validating XML documents, 623–624 (JAXP)
  - W3C XML Schema Language, 27 (XML)
  - Web applications, defining, 664 (Deployment)
  - Web components and WAR files, 664 (Deployment)
  - Web service endpoint interface, 275 (JAX-RPC)
  - Web service endpoints, 279 (JAX-RPC)
    - accessing, 677 (Deployment)
    - describing, 681–683 (Deployment)
    - header block information, 395 (JAX-RPC)

- interfaces, 278 (JAX-RPC)
- invoking operations, 279 (JAX-RPC)
- message handlers, 409 (JAX-RPC)
- object facades for accessing, 327 (JAX-RPC)
- OUT and INOUT parameters, 349 (JAX-RPC)
- publishing WSDL document, 277 (JAX-RPC)
- stateless session beans, 315–326 (JAX-RPC)
- translating method calls into SOAP communications with, 330 (JAX-RPC)
- Web service references, 677–679 (Deployment)
  - display elements, 685 (Deployment)
  - handler element, 685–691 (Deployment)
  - jaxrpc-mapping-file element, 683 (Deployment)
  - port-component-ref element, 683–685 (Deployment)
  - service-interface element, 680–681 (Deployment)
  - service-qname element, 681–683 (Deployment)
  - service-ref-name element, 679–680 (Deployment)
  - wSDL-file element, 681–683 (Deployment)
- Web services, 96 (SOAP and WSDL)
  - A2A (Application-to-Application) integration, 4 (Overview)
  - abstract interface, 137–145 (SOAP and WSDL)
  - accessible in multiple modes, 545–553 (JAXR)
  - applications, 9–10 (Overview) (SOAP and WSDL)
  - assigning URL to, 188 (UDDI)
  - associating SpecificationLink objects with, 551–553 (JAXR)
  - B2B (Business-to-Business) communication, 4 (Overview)
  - bean acting as, 309–310 (JAX-RPC)
  - BP (Basic Profile) 1.0, 5–6 (Overview)
  - clients
    - initiating communication with, 145–147 (SOAP and WSDL)
    - sending message without response, 147 (SOAP and WSDL)
    - SOAP APIs and, 129 (SOAP and WSDL)
    - collection of, 550–551 (JAXR)
    - compliant with WS-I BP (Basic Profile) 1.0, 129 (SOAP and WSDL)
    - conforming with WS-I Basic Profile 1.0, 545–553 (JAXR)
    - defining abstract interface, 142–143 (SOAP and WSDL)
    - definition of, 4 (Overview)
    - deployment descriptors, 403 (JAX-RPC), 693–694 (Deployment)
    - describing, 128–129 (SOAP and WSDL)
    - detailed description, 679 (Deployment)
    - DTDs (Document Type Definitions), 33–34 (XML)
    - EJB (Enterprise JavaBeans), 315–326 (JAX-RPC)
    - electronic address, 550–553 (JAXR)
    - exact electronic address, 183–184 (UDDI)
    - exchanging
      - messages with, 447 (JAX-RPC)
      - SOAP messages with, 129 (SOAP and WSDL)
    - exposing traditional components, 108 (SOAP and WSDL)
    - grouping, 545–553 (JAXR)
    - implementations, 174 (UDDI), 182–185 (UDDI)
    - IN, OUT, and INOUT parameters, 431–432 (JAX-RPC), 453 (JAX-RPC)
    - Inquiry operation, 481–482 (JAXR)
    - Internet address of, 182–185 (UDDI)
    - interoperability, 1 (Overview)
      - between platforms, 660–662 (Deployment)
      - standard, 5–6 (Overview)
    - logical grouping, 543–544 (JAXR)
    - mapping XML schema types to native primitive types, structures, and objects, 58 (XML)
    - MEPs (message exchange patterns), 145–148 (SOAP and WSDL)
    - multiple language-specific names, 548–549 (JAXR), 551 (JAXR)
    - One-Way messaging, 82 (SOAP and WSDL)
    - payload of message used by, 137–142 (SOAP and WSDL)
    - port and UDDI registries, 182 (UDDI)
    - port element, 161–162 (SOAP and WSDL)
    - preference for XML Schema Language, 33–34 (XML)
    - programmatically interface for accessing, 128–129 (SOAP and WSDL)
    - publishing in UDDI, 187 (UDDI)
    - Publishing operation, 481–482 (JAXR)
    - reading documentation for, 128 (SOAP and WSDL)
    - Request/Response messaging, 82 (SOAP and WSDL)
    - session data, 299 (JAX-RPC)
    - session tracking, 298–299 (JAX-RPC)
    - SOAP (Simple Object Access Protocol), 4 (Overview), 7 (Overview), 127 (SOAP and WSDL)
    - SOAP-based, 129 (SOAP and WSDL)
    - SOAP-specific details, 150 (SOAP and WSDL)
    - specification tModel, 553–564 (JAXR)
    - standards, 3 (Overview)
    - stateless session beans, 277 (JAX-RPC), 309–310 (JAX-RPC)
    - technical aspect of, 184–185 (UDDI)
    - technical specifications, 553 (JAXR)
    - technologies, 3–10 (Overview)
    - type of protocol, 576 (JAXR)
    - UDDI (Universal Description, Discovery, and Integration), 4 (Overview), 9–10 (Overview), 201 (UDDI)
    - UUID key, 551 (JAXR)
    - WSDL (Web Service Description Language), 4 (Overview), 9 (Overview)
    - WS-I-conformant, 6 (Overview)
    - XML documents, 22 (XML)

- Web services, (*cont.*)
  - XML (eXtensible Markup Language), 4 (Overview), 7 (Overview)
  - XML Schema Language, 739
  - Yellow Pages for, 10 (Overview)
- Web Services API, 2 (Overview)
- Web services deployment
  - deployment descriptors for J2EE components, 663 (Deployment)
  - JAX-RPC mapping files, 662–663 (Deployment)
  - J2EE endpoint, 657–660 (Deployment)
  - WSDL documents, 660–662 (Deployment)
- Web Services Interoperability Organization, 5 (Overview)
- WEB-INF subdirectory, 664 (Deployment)
- webservices element, 694 (Deployment)
- webservices.xml deployment
  - descriptor, 319 (JAX-RPC), 409 (JAX-RPC), 410 (JAX-RPC), 660 (Deployment), 664 (Deployment), 666 (Deployment)
- webservices.xml file, 693–694 (Deployment), 705 (Deployment)
- BookQuoteEJB, 699 (Deployment)
- BookQuoteJSE, 698–699 (Deployment)
- declaring two message handlers, 701–702 (Deployment)
- handler element, 685 (Deployment)
- handler-name element, 702 (Deployment)
- information about JSE, 667 (Deployment)
- web.xml deployment descriptor, 663–672 (Deployment)
- web.xml file, 665–672 (Deployment)
- BookQuoteJSE, 699 (Deployment)
- configuring JNDI ENC, 668–669 (Deployment)
- example, 666 (Deployment)
- identifying JSEs, 666–667 (Deployment)
- initialization properties, 667–668 (Deployment)
- service-ref element, 678–679 (Deployment)
- servlet definition, 698 (Deployment)
- wild card character (%), 207–208 (UDDI), 587 (JAXR)
- Windows, associating file extensions with specific applications, 783 (Appndx)
- Winner, Dave, 83 (SOAP and WSDL)
- writeTo() method, 361 (JAX-RPC), 784 (Appndx), 788 (Appndx)
- WS-Attachments, 771 (Appndx)
- WSDL 1.1
  - namespace, 149 (SOAP and WSDL)
  - XML schema namespace, 133 (SOAP and WSDL)
- WSDL documents, 9 (Overview), 128 (SOAP and WSDL)
  - abstract definitions, 428 (JAX-RPC)
  - adding soapbind:headerdefault element, 159–161 (SOAP and WSDL)
  - arrays, 440 (JAX-RPC)
  - aware of any and all namespaces used, 135 (SOAP and WSDL)
  - BookQuote Web service, 329–330 (JAX-RPC)
  - complex types as INOUT parameter, 464–465 (JAX-RPC)
  - declaring
    - INOUT parameter, 458 (JAX-RPC)
    - MIME attachment as return type, 823 (Appndx)
  - default namespace, 149 (SOAP and WSDL)
  - defined MIME attachments, 812–814 (Appndx)
  - defining, 400–402 (JAX-RPC)
  - fault complex type and base type, 471 (JAX-RPC)
  - fault message, 467–468 (JAX-RPC)
  - for getBulkBookQuote operation, 348 (JAX-RPC)
  - IDF attachment, 826 (Appndx)
  - MIME attachment as INOUT parameter, 824–825 (Appndx)
  - multipart/\* MIME binding, 818–819 (Appndx)
  - two XML MIME bindings, 821 (Appndx)
- definitions element, 133–134 (SOAP and WSDL)
  - describing
    - BookQuote Web service, 131–132 (SOAP and WSDL)
    - Web service endpoint, 681–683 (Deployment)
    - where to store, 9–10 (Overview)
  - difficulty with, 129 (SOAP and WSDL)
  - DII (Dynamic Invocation Interface) use with, 344–349 (JAX-RPC)
  - elements, 129–131 (SOAP and WSDL)
  - endpoint interface, 328 (JAX-RPC)
    - generated from, 814–815 (Appndx)
  - exact location of, 682 (Deployment)
  - fault message with XML Schema complex type, 469 (JAX-RPC)
  - generated stub class, 328 (JAX-RPC)
  - generating service and endpoint interfaces, 402–403 (JAX-RPC)
  - identifying binding, 188 (UDDI)
  - implementation definitions, 428 (JAX-RPC)
  - importing WSDL document namespaces, 136–137 (SOAP and WSDL)
  - multiple package-mapping elements, 719–720 (Deployment)
  - namespace of elements defined in, 133 (SOAP and WSDL)
  - naming, 133 (SOAP and WSDL)
  - One-Way, Document/Literal messaging with MIME binding, 814 (Appndx)
  - One-Way Web service, 337–338 (JAX-RPC)
  - platform-specific flavor, 660–661 (Deployment)
  - PurchaseOrder Web service, 443–444 (JAX-RPC)
  - relative to root of WAR or EJB JAR file, 694–696 (Deployment)
  - service element, 682 (Deployment)
  - service interface generated from, 332 (JAX-RPC)

- supporting
    - heavyweight mapping, 713–715 (Deployment)
    - lightweight mapping, 710–713 (Deployment)
  - tModel data structure, 187–188 (UDDI)
  - UTF-8 or UTF-16 encoding, 132 (SOAP and WSDL)
  - valid and well formed, 129 (SOAP and WSDL)
  - versioning, 137 (SOAP and WSDL)
  - WSDL restricted array as INOUT parameter, 466 (JAX-RPC)
  - XML namespaces for typing values, 617–620 (JAXP)
  - XPointer to WSDL binding element, 187 (UDDI)
  - WSDL files, 694 (Deployment)
  - WSDL modifiers for RPC/Encoded arrays, 440 (JAX-RPC)
  - WSDL port message handlers, 690 (Deployment)
  - WSDL tModel template, 188 (UDDI)
  - WSDL tModel wsdlSpec UDDI type, 188 (UDDI)
  - WSDL (Web Services Description Language), 4 (Overview), 9 (Overview), 33 (XML), 79 (SOAP and WSDL), 128 (SOAP and WSDL), 758 (Appndx)
    - abstract interface, 137–145 (SOAP and WSDL)
    - basic structure, 129–132 (SOAP and WSDL)
    - code generators, 128–129 (SOAP and WSDL)
    - complexity, 129 (SOAP and WSDL)
    - declarations, 132–137 (SOAP and WSDL)
    - defining
      - array data types, 135–136 (SOAP and WSDL)
      - data types, 134–136 (SOAP and WSDL)
    - fault element, 157 (SOAP and WSDL)
    - faults, 467–473 (JAX-RPC)
    - HTTP and MIME bindings, 150–151 (SOAP and WSDL)
    - HTTPS (HTTP 1.1 over SSL (Secure Sockets Layer)), 152 (SOAP and WSDL)
    - implementation, 148–161 (SOAP and WSDL), 161–162 (SOAP and WSDL)
    - interoperability, 9 (Overview)
    - language-agnostic definition, 661–662 (Deployment)
    - mapping
      - fault message to Java exception class, 723–725 (Deployment)
      - Holder types, 457–467 (JAX-RPC)
      - to Java, 281 (JAX-RPC), 428–434 (JAX-RPC), 659 (Deployment)
    - MEPs (message exchange patterns), 145–148 (SOAP and WSDL)
    - modes of parameters used, 661 (Deployment)
    - modularity, 129 (SOAP and WSDL)
    - operation overloading, 145 (SOAP and WSDL)
    - programming-language neutral, 139 (SOAP and WSDL)
    - RPC-style messaging, 144 (SOAP and WSDL)
    - SOAP binding, 151–161 (SOAP and WSDL)
    - versions, 9 (Overview)
  - WSDL (Web Services Description Language)
    - fully qualified name, 682 (Deployment)
  - WSDL-based Web service, 196–197 (UDDI)
  - wsdl-binding element, 730 (Deployment)
  - wsdl-file element, 681–683 (Deployment), 694–696 (Deployment)
  - wsdl-message-mapping element, 732 (Deployment)
  - wsdl-message-part-name element, 732 (Deployment)
  - wsdl-operation element, 731 (Deployment)
  - wsdl-port element, 694–696 (Deployment)
  - wsdl-port-type element, 730 (Deployment)
  - wsdl-return-value-mapping element, 732 (Deployment)
  - wsdlSpec categorization, 186 (UDDI)
  - wsdlSpec tModel type, 192 (UDDI)
  - wsdlSpec UDDI type, 186–188 (UDDI)
  - WSDL-to-endpoint interfaces, 429 (JAX-RPC)
  - WS-I Basic Profile 1.0, 79 (SOAP and WSDL), 335 (JAX-RPC)
  - ebXML, 477 (JAXR)
    - RPC/Encoded messaging, 755 (Appndx)
    - SOAP only over HTTP, 82 (SOAP and WSDL)
    - UDDI, 477 (JAXR)
    - XML documents, 22 (XML)
  - WS-I Conformance Claims, 558–559 (JAXR)
  - WS-I Security Profile, 106 (SOAP and WSDL)
  - WS-I (Web Services Interoperability Organization), 1 (Overview)
  - WS-I-conformant Web services, 6 (Overview)
  - WS-J2EE 1.1 (Web Services for J2EE 1.1) specification, 3 (Overview)
  - WS-Security specification fault codes, 116–117 (SOAP and WSDL)
  - WS-Transactions, 673 (Deployment)
- ## X
- X.509 certificates, 485 (JAXR)
  - Xerces parser, 623 (JAXP)
  - Xerces-J, 25–26 (XML)
  - XHTML, 19–20 (XML)
  - x-java-content-handler command, 787 (Appndx)
  - x-java-edit command, 787 (Appndx)
  - x-java-print command, 787 (Appndx)
  - x-java-view command, 787 (Appndx)
  - XML 1.0 namespace and xml:lang attribute, 117 (SOAP and WSDL)
  - XML applications, 19 (XML)
  - XML data
    - describing structure, 9 (Overview)
    - manipulating with native constructs, 58 (XML)
    - routing and packaging, 7 (Overview)
  - XML declaration, 21 (XML)
  - XML digital signature, 406 (JAX-RPC)

- XML document fragment, 107–108 (SOAP and WSDL)
- XML document instance, 20–21 (XML), 625 (JAXP)
- XML documents, 7 (Overview), 12 (Overview), 171 (UDDI)
  - accessing from JAXP and DOM, 628 (JAXP)
  - address information, 27–28 (XML)
  - associating with DTD, 622 (JAXP)
  - Base64 encoding, 753 (Appndx)
  - based on multiple markup languages, 26–27 (XML)
  - beginning and end of processing, 612 (JAXP)
  - building with JAXP and DOM, 642–645 (JAXP)
  - comments, 23–24 (XML)
  - complex types, 35 (XML)
  - conforming to specific markup language, 55 (XML)
  - counting number of elements in, 612 (JAXP)
  - default namespace, 54 (XML)
  - describing structure, 35 (XML)
  - documentation, 23–24 (XML)
  - DTDs (Document Type Definitions), 739 (Appndx)
  - enforcing validity, 25 (XML)
  - errors, 622 (JAXP)
  - events, 12 (Overview)
  - exchanged between applications, 820 (Appndx)
  - exchanging, 7–9 (Overview)
  - fatal errors, 622 (JAXP)
  - generic, object-oriented model, 25 (XML)
  - multiple root elements, 51 (XML)
  - nodes, 625 (JAXP)
  - non-normalized, 639–640 (JAXP)
  - normalized, 639–640 (JAXP)
  - objects, 12 (Overview)
  - outputting attributes, 636–637 (JAXP)
  - parsing, 606–608 (JAXP)
  - parts of, 21–25 (XML)
  - plain text, 820 (Appndx)
  - portability, 20 (XML)
  - printing element names and values, 629–630 (JAXP)
  - processing, 25–26 (XML)
  - qualified local elements, 53 (XML)
  - readable by humans, 820 (Appndx)
  - root element, 22 (XML), 50–51 (XML), 85 (SOAP and WSDL)
  - saving, 20 (XML)
  - SAX methods corresponding to parts of, 608–621 (JAXP)
  - simple types, 35 (XML)
  - standalone, 21 (XML)
  - start and end tags marking boundaries of elements, 613–617 (JAXP)
  - storing address information, 20 (XML)
  - structure of, 625 (JAXP)
  - tag names with proper indentation, 614–615 (JAXP)
  - transferring over network, 20 (XML)
  - tree of nodes, 628–641 (JAXP)
  - Unicode text, 18 (XML)
  - unqualified local elements, 54 (XML)
  - UTF-8 or UTF-16 encoding, 22 (XML)
  - validating, 78 (XML)
    - against schemas, 55 (XML)
    - with W3C XML schema, 623–624 (JAXP)
  - verifying, 406 (JAX-RPC)
  - well formed, 25 (XML)
  - WSDL XML schema, 129 (SOAP and WSDL)
    - XML declaration, 21 (XML)
- XML elements, 86 (SOAP and WSDL)
  - Body element, 88 (SOAP and WSDL)
  - header blocks, 89–90 (SOAP and WSDL)
  - Header element, 88 (SOAP and WSDL)
  - identified by its own namespace, 87–88 (SOAP and WSDL)
- XML (eXtensible Markup Language), 4 (Overview), 7 (Overview), 57 (XML)
  - address document, 18 (XML)
  - attachment and generated stub, 822 (Appndx)
  - basics, 17–26 (XML)
  - combining default namespaces and namespaces prefixes, 30–31 (XML)
  - data-oriented markup languages, 19–20 (XML)
  - de facto standards, 19 (XML)
  - declaration, 132 (SOAP and WSDL)
  - declaring namespaces, 28 (XML)
  - describing markup language syntax, 19 (XML)
  - document-oriented markup languages, 19 (XML)
  - DTDs (Document Type Definitions), 739–743 (Appndx)
  - element names, 19 (XML)
  - elements, 17–18 (XML), 21–22 (XML)
  - encoding format, 85 (SOAP and WSDL)
  - end tag, 17 (XML)
  - eXtensible, 19 (XML)
  - industry standards, 20 (XML)
  - legal syntax, 19 (XML)
  - manipulating, 18 (XML)
  - mappings to Java, 281 (JAX-RPC)
  - namespaces, 26–32 (XML)
  - parsing, 18 (XML)
  - plain text, 19 (XML)
  - rules for creating, 17 (XML)
  - schema elements and complex types, 234–235 (UDDI)
  - self-describing, 18 (XML)
  - serializing programing-language structures into, 755–769 (Appndx)
  - start tag, 17 (XML)
  - syntactical rules, 18 (XML)
  - tags, 17 (XML)
  - transparency to non-text formats and relational database file formats, 19 (XML)
  - UTF-8 or UTF-16 encoding, 85 (SOAP and WSDL)
  - version, 21 (XML), 85 (SOAP and WSDL)
- XML files and DOM tree creation from, 627–628 (JAXP)
- XML format, 7–9 (Overview)
- XML instances
  - polymorphism, 62 (XML)
  - QName prefixes, 52 (XML)
  - validity, 34 (XML)
- XML name methods, 634–636 (JAXP)
- XML namespaces, 8 (Overview)
  - actor attribute, 99 (SOAP and WSDL)
  - assigning prefix mh, 36 (XML)
  - attributes and element values, 617–620 (JAXP)
  - avoiding name collisions, 91 (SOAP and WSDL)

- declarations, 133 (SOAP and WSDL)
  - proper versioning and processing, 91–92 (SOAP and WSDL)
  - SOAP elements, 84–85 (SOAP and WSDL)
  - SOAP messages, 88–90 (SOAP and WSDL)
  - types explicitly created within schema, 36 (XML)
  - XML parsers, 20 (XML), 25 (XML)
  - XML qualified name abstraction, 364–367 (JAX-RPC)
  - XML Schema
    - associating types with Java types, 720–723 (Deployment)
    - built-in list type, 69 (XML)
    - built-in simple types, 435–436 (JAX-RPC)
    - complex type and fault messages, 469–470 (JAX-RPC)
    - complex types, 436–440 (JAX-RPC)
    - mapping to Java, 434–452 (JAX-RPC)
    - namespace and constants, 352 (JAX-RPC)
    - PurchaseOrder Markup Language, 446 (JAX-RPC)
    - PurchaseOrder Markup Language with non-standard XML Schema, 446–447 (JAX-RPC)
    - regular expressions, 66 (XML)
    - Schematron, 78 (XML)
    - tModel data structure, 194–198 (UDDI)
    - type definition for UDDI businessEntity data structure, 508–509 (JAXR)
  - XML schema document type, 36–37 (XML), 352 (JAX-RPC)
  - XML Schema Language, 739 (Appndx)
  - advanced, 57–77 (XML)
  - basics, 33–57 (XML)
  - built-in types, 36–39 (XML)
  - complex types, 39–49 (XML)
  - extension inheritance, 58–60 (XML)
  - inheritance and complex types, 58–64 (XML)
  - simple types, 36–39 (XML)
  - strong type system, 34 (XML)
  - type inheritance, 34 (XML)
  - Web service preference for, 33–34 (XML)
  - XML namespaces, 34 (XML)
  - XML namespace, 36 (XML)
  - XML Schema Part 2: Datatypes*, 39 (XML)
  - XML Schema Part 2:Datatypes* Web site, 37 (XML)
  - XML schema specification
    - built-in simple types, 37 (XML)
    - date type, 37 (XML)
    - facets, 64–66 (XML)
    - float type, 37 (XML)
    - string type, 37 (XML)
    - unsignedShort type, 37 (XML)
  - XML schema-instance namespace, 56 (XML)
  - XML schema-instance attributes, 55 (XML)
  - XML schema-instance namespace, 56–57 (XML)
  - XML Schema-Instance simple types, 759 (Appndx)
  - XML schemas, 8 (Overview)
    - global attributes, 51–52 (XML)
    - polymorphism, 62 (XML)
    - regular expressions, 745–750 (Appndx)
  - XML specification, 19–20 (XML)
  - XML types
    - derived, 91 (SOAP and WSDL)
    - UDDI, 202 (UDDI)
  - xml:lang attribute, 117 (SOAP and WSDL), 172–173 (UDDI), 194 (UDDI), 208 (UDDI), 386 (JAX-RPC), 515 (JAXR)
  - xmlns attribute, 28–29 (XML)
  - XMLReader class, 606–608 (JAXP)
  - XMLReaderFactory class, 606–608 (JAXP)
  - xmlSpec tModel type, 192 (UDDI)
  - XOM, 26 (XML)
  - XPath, 805 (Appndx)
  - XPointer, 188 (UDDI), 557 (JAXR)
  - XSD and QName constant values for types, 350 (JAX-RPC)
  - xsd:any element, 450–451 (JAX-RPC)
  - xsd:any type, 450–451 (JAX-RPC)
  - xsd:dateTime types, 457 (JAX-RPC)
  - xsd:float type, 429 (JAX-RPC), 436 (JAX-RPC), 830 (Appndx), 834–835 (Appndx)
  - xsd:int element, 451 (JAX-RPC)
  - xsd:int values, 457 (JAX-RPC)
  - xsd:string type, 429 (JAX-RPC), 436 (JAX-RPC), 523 (JAXR), 525 (JAXR), 832
  - xsi:schemaLocation attribute, 56–57 (XML), 57 (XML), 91 (SOAP and WSDL), 623–624 (JAXP)
  - xsi:type attribute, 56 (XML), 62–63 (XML), 91 (SOAP and WSDL), 607 (JAXP), 619 (JAXP), 642 (JAXP)
  - XSLT (Extensible Stylesheet Language Transformations), 805 (Appndx)
  - xxxInfos response structures, 215–217 (UDDI)
  - xxxInfos types, definitions of, 215–217 (UDDI)
- ## Z
- zip element, 34 (XML), 39 (XML), 45 (XML), 49 (XML), 59–60 (XML), 741–742 (Appndx)
  - ZLIB compression standards, 663–664 (Deployment)