



Creating A Single Global Electronic Market

1

2 **ebXML Registry Services Specification v1.0**

3 **ebXML Registry Project Team**

4 **10 May 2001**

5

6 **1 Status of this Document**

7

8 This document specifies an ebXML DRAFT STANDARD for the eBusiness community.

9

10 Distribution of this document is unlimited.

11

12 The document formatting is based on the Internet Society's Standard RFC format.

13

14 ***This version:***

15 <http://www.ebxml.org/specs/ebRS.pdf>

16

17 ***Latest version:***

18 <http://www.ebxml.org/specs/ebRS.pdf>

19

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232 **3 Introduction**

233 **3.1 Summary of Contents of Document**

234 This document defines the interface to the ebXML *Registry Services* as well as
235 interaction protocols, message definitions and XML schema.

236 A separate document, *ebXML Registry Information Model* [ebRIM], provides information
237 on the types of metadata that are stored in the Registry as well as the relationships
238 among the various metadata classes.

239 **3.2 General Conventions**

240 The following conventions are used throughout this document:

- 241 o UML diagrams are used as a way to concisely describe concepts. They are not
242 intended to convey any specific *Implementation* or methodology requirements.
- 243 o The term "*repository item*" is used to refer to an object that has been submitted to a
244 Registry for storage and safekeeping (e.g. an XML document or a DTD). Every
245 repository item is described by a RegistryEntry instance.
- 246 o The term "*RegistryEntry*" is used to refer to an object that provides metadata about a
247 *repository item*.
- 248 o *Capitalized Italic* words are defined in the ebXML Glossary.

249 The keywords MUST, MUST NOT, REQUIRED, SHALL, SHALL NOT, SHOULD,
250 SHOULD NOT, RECOMMENDED, MAY, and OPTIONAL, when they appear in this
251 document, are to be interpreted as described in RFC 2119 [Bra97].

252 **3.3 Audience**

253 The target audience for this specification is the community of software developers who
254 are:

- 255 o Implementers of ebXML Registry Services
- 256 o Implementers of ebXML Registry Clients

257 **3.4 Related Documents**

258 The following specifications provide some background and related information to the
259 reader:

- 260 a) *ebXML Registry Information Model* [ebRIM]
- 261 b) *ebXML Message Service Specification* [ebMS]
- 262 c) *ebXML Business Process Specification Schema* [ebBPM]
- 263 d) *ebXML Collaboration-Protocol Profile and Agreement Specification* [ebCPP]

264 4 Design Objectives

265 4.1 Goals

266 The goals of this version of the specification are to:

- 267 o Communicate functionality of Registry services to software developers
- 268 o Specify the interface for Registry clients and the Registry
- 269 o Provide a basis for future support of more complete ebXML Registry requirements
- 270 o Be compatible with other ebXML specifications

271 4.2 Caveats and Assumptions

272 The Registry Services specification is first in a series of phased deliverables. Later
273 versions of the document will include additional functionality planned for future
274 development.

275 It is assumed that:

- 276 1. Interoperability requirements dictate that the ebXML Message Services
277 Specification is used between an ebXML Registry and an ebXML Registry
278 Client. The use of other communication means is not precluded; however, in
279 those cases interoperability cannot be assumed. Other communication means
280 are outside the scope of this specification.
- 281 2. All access to the Registry content is exposed via the interfaces defined for the
282 Registry Services.
- 283 3. The Registry makes use of a Repository for storing and retrieving persistent
284 information required by the Registry Services. This is an implementation detail
285 that will not be discussed further in this specification.

286 5 System Overview

287 5.1 What The ebXML Registry Does

288 The ebXML Registry provides a set of services that enable sharing of information
289 between interested parties for the purpose of enabling *business process* integration
290 between such parties based on the ebXML specifications. The shared information is
291 maintained as objects in a repository and managed by the ebXML Registry Services
292 defined in this document.

293 5.2 How The ebXML Registry Works

294 This section describes at a high level some use cases illustrating how Registry clients
295 may make use of Registry Services to conduct B2B exchanges. It is meant to be
296 illustrative and not prescriptive.

297 The following scenario provides a high level textual example of those use cases in
298 terms of interaction between Registry clients and the Registry. It is not a complete listing
299 of the use cases that could be envisioned. It assumes for purposes of example, a buyer
300 and a seller who wish to conduct B2B exchanges using the RosettaNet PIP3A4
301 Purchase Order business protocol. It is assumed that both buyer and seller use the
302 same Registry service provided by a third party. Note that the architecture supports
303 other possibilities (e.g. each party uses its own private Registry).

304 **5.2.1 Schema Documents Are Submitted**

305 A third party such as an industry consortium or standards group submits the necessary
306 schema documents required by the RosettaNet PIP3A4 Purchase Order business
307 protocol with the Registry using the ObjectManager service of the Registry described in
308 Section 7.3.

309 **5.2.2 Business Process Documents Are Submitted**

310 A third party, such as an industry consortium or standards group, submits the necessary
311 business process documents required by the RosettaNet PIP3A4 Purchase Order
312 business protocol with the Registry using the ObjectManager service of the Registry
313 described in Section 7.3.

314 **5.2.3 Seller's Collaboration Protocol Profile Is Submitted**

315 The seller publishes its *Collaboration Protocol Profile* or CPP as defined by [ebCPP] to
316 the Registry. The CPP describes the seller, the role it plays, the services it offers and
317 the technical details on how those services may be accessed. The seller classifies their
318 Collaboration Protocol Profile using the Registry's flexible *Classification* capabilities.

319 **5.2.4 Buyer Discovers The Seller**

320 The buyer browses the Registry using *Classification* schemes defined within the
321 Registry using a Registry Browser GUI tool to discover a suitable seller. For example
322 the buyer may look for all parties that are in the Automotive Industry, play a seller role,
323 support the RosettaNet PIP3A4 process and sell Car Stereos.

324 The buyer discovers the seller's CPP and decides to engage in a partnership with the
325 seller.

326 **5.2.5 CPA Is Established**

327 The buyer unilaterally creates a *Collaboration Protocol Agreement* or CPA as defined by
328 [ebCPP] with the seller using the seller's CPP and their own CPP as input. The buyer
329 proposes a trading relationship to the seller using the unilateral CPA. The seller accepts
330 the proposed CPA and the trading relationship is established.

331 Once the seller accepts the CPA, the parties may begin to conduct B2B transactions as
332 defined by [ebMS].

333 **5.3 Where the Registry Services May Be Implemented**

334 The Registry Services may be implemented in several ways including, as a public web
335 site, as a private web site, hosted by an ASP or hosted by a VPN provider.

336 **5.4 Implementation Conformance**

337 An implementation is a *conforming* ebXML Registry if the implementation meets the
338 conditions in Section 5.4.1. An implementation is a conforming ebXML Registry Client if
339 the implementation meets the conditions in Section 5.4.2. An implementation is a
340 conforming ebXML Registry and a conforming ebXML Registry Client if the
341 implementation conforms to the conditions of Section 5.4.1 and Section 5.4.2. An
342 implementation shall be a conforming ebXML Registry, a conforming ebXML Registry
343 Client, or a conforming ebXML Registry and Registry Client.

344 **5.4.1 Conformance as an ebXML Registry**

345 An implementation conforms to this specification as an ebXML registry if it meets the
346 following conditions:

- 347 1. Conforms to *the ebXML Registry Information Model [ebRIM]*.
- 348 2. Supports the syntax and semantics of the Registry Interfaces and Security
349 Model.
- 350 3. Supports the defined ebXML Registry DTD (Appendix A)
- 351 4. Optionally supports the syntax and semantics of Section 8.3, SQL Query
352 Support.

353 **5.4.2 Conformance as an ebXML Registry Client**

354 An implementation conforms to this specification, as an ebXML Registry Client if it
355 meets the following conditions:

- 356 1. Supports the ebXML CPA and bootstrapping process.
- 357 2. Supports the syntax and the semantics of the Registry Client Interfaces.
- 358 3. Supports the defined ebXML Error Message DTD.
- 359 4. Supports the defined ebXML Registry DTD.

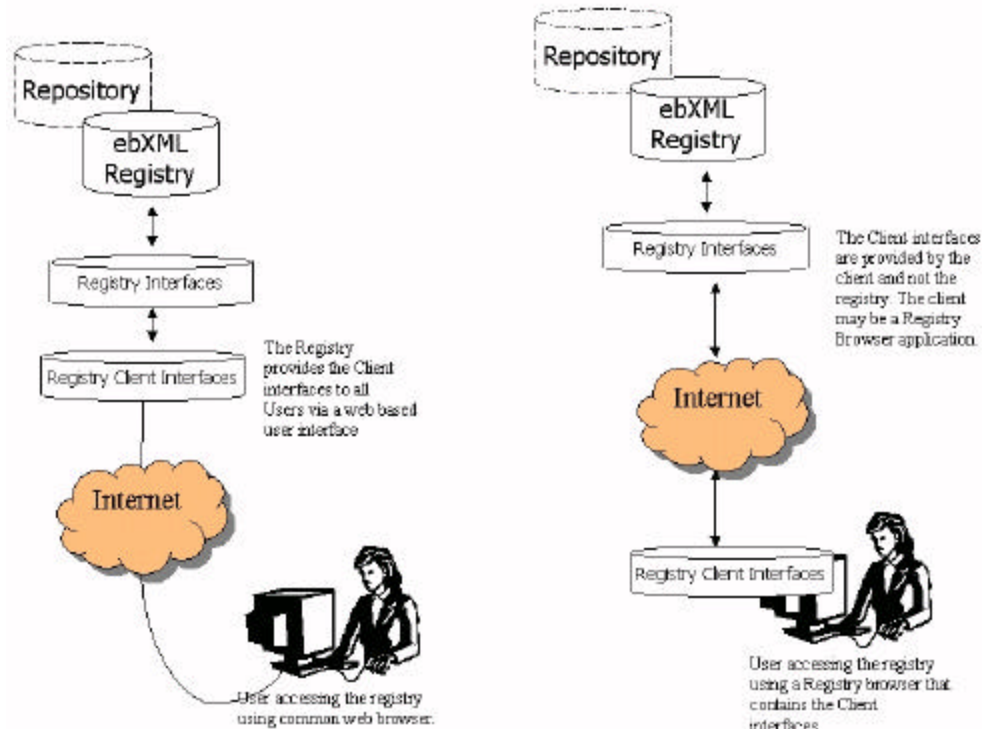
360 **6 Registry Architecture**

361 The ebXML Registry architecture consists of an ebXML Registry and ebXML Registry
 362 Clients. The Registry Client interfaces may be local to the registry or local to the user.
 363 Figure 1 depicts the two possible topologies supported by the registry architecture with
 364 respect to the Registry and Registry Clients.

365 The picture on the left side shows the scenario where the Registry provides a web
 366 based “thin client” application for accessing the Registry that is available to the user
 367 using a common web browser. In this scenario the Registry Client interfaces reside
 368 across the internet and are local to the Registry from the user’s view.

369 The picture on the right side shows the scenario where the user is using a “fat client”
 370 Registry Browser application to access the registry. In this scenario the Registry Client
 371 interfaces reside within the Registry Browser tool and are local to the Registry from the
 372 user’s view. The Registry Client interfaces communicate with the Registry over the
 373 internet in this scenario.

374 A third topology made possible by the registry architecture is where the Registry Client
 375 interfaces reside in a server side business component such as a Purchasing business
 376 component. In this topology there may be no direct user interface or user intervention
 377 involved. Instead the Purchasing business component may access the Registry in an
 378 automated manner to select possible sellers or service providers based current
 379 business needs.



380

381

Figure 1: Registry Architecture Supports Flexible Topologies

382 Clients communicate with the Registry using the ebXML Messaging Service in the same
383 manner as any two ebXML applications communicating with each other.

384 Future versions of this specification may provide additional services to explicitly extend
385 the Registry architecture to support distributed registries. However this current version
386 of the specification does not preclude ebXML Registries from cooperating with each
387 other to share information, nor does it preclude owners of ebXML Registries from
388 registering their ebXML registries with other registry systems, catalogs, or directories.

389 Examples include:

- 390 • an ebXML Registry of Registries that serves as a centralized registration point;
- 391 • cooperative ebXML Registries, where registries register with each other in a
392 federation;
- 393 • registration of ebXML Registries with other Registry systems that act as white
394 pages or yellow pages. The document [ebXML-UDDI] provides an example of
395 ebXML Registries being discovered through a system of emerging white/yellow
396 pages known as UDDI.

397 **6.1 ebXML Registry Profiles and Agreements**

398 The ebXML CPP specification [ebCPP] defines a Collaboration-Protocol Profile (CPP)
399 and a Collaboration-Protocol Agreement (CPA) as mechanisms for two parties to share
400 information regarding their respective business processes. That specification assumes
401 that a CPA has been agreed to by both parties in order for them to engage in B2B
402 interactions.

403 This specification does not mandate the use of a CPA between the Registry and the
404 Registry Client. However if the Registry does not use a CPP, the Registry shall provide
405 an alternate mechanism for the Registry Client to discover the services and other
406 information provided by a CPP. This alternate mechanism could be simple URL.

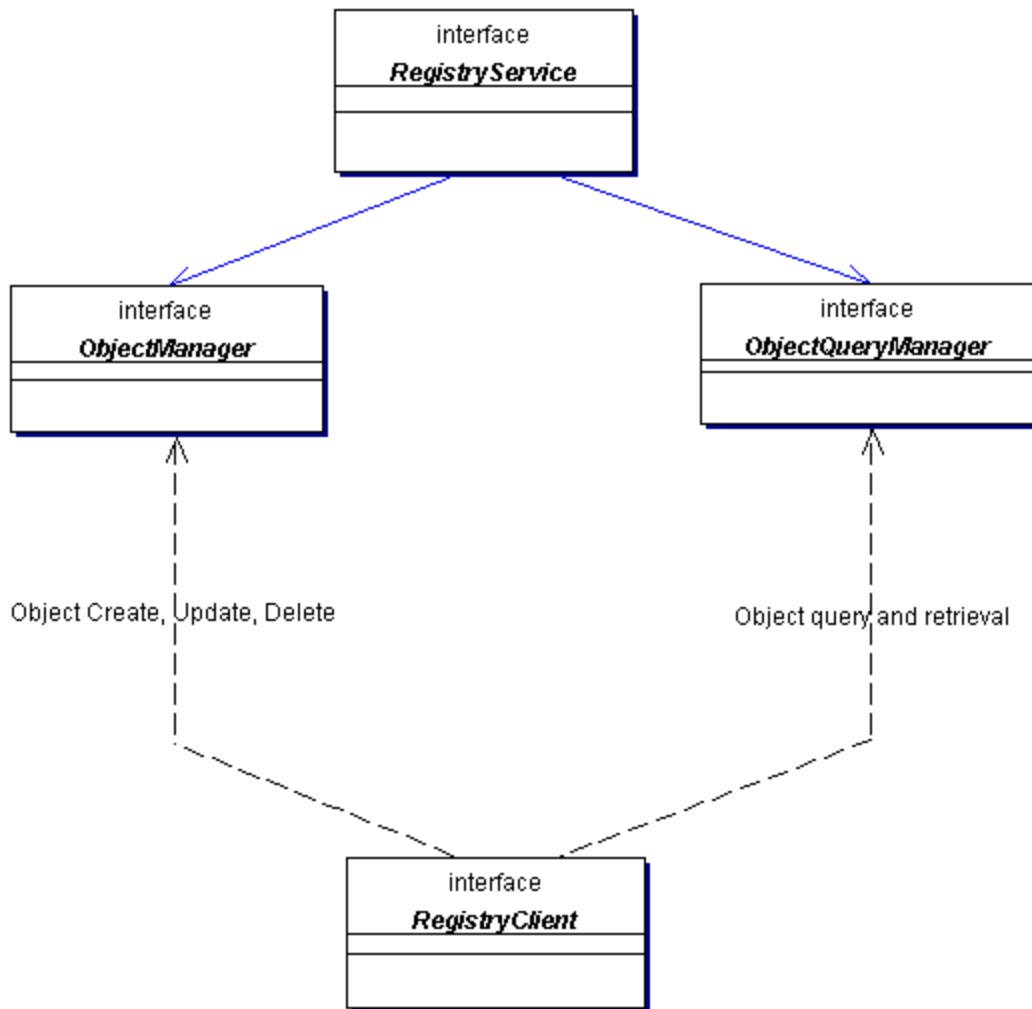
407 The CPA between clients and the Registry should describe the interfaces that the
408 Registry and the client expose to each other for Registry-specific interactions. These
409 interfaces are described in Figure 2 and subsequent sections. The definition of the
410 Registry CPP template and a Registry Client CPP template are beyond the scope of this
411 document.

412 **6.2 Client To Registry Communication Bootstrapping**

413 Since there is no previously established CPA between the Registry and the
414 RegistryClient, the client must know at least one Transport-specific communication
415 address for the Registry. This communication address is typically a URL to the Registry,
416 although it could be some other type of address such as an email address.

417 For example, if the communication used by the Registry is HTTP, then the
 418 communication address is a URL. In this example, the client uses the Registry's public
 419 URL to create an implicit CPA with the Registry. When the client sends a request to the
 420 Registry, it provides a URL to itself. The Registry uses the client's URL to form its
 421 version of an implicit CPA with the client. At this point a session is established within the
 422 Registry.

423 For the duration of the client's session with the Registry, messages may be exchanged
 424 bidirectionally as required by the interaction protocols defined in this specification.



425
 426

Figure 2: ebXML Registry Interfaces

427 **6.3 Interfaces**

428 This specification defines the interfaces exposed by both the Registry (Section 6.4) and
 429 the Registry Client (Section 6.5). Figure 2 shows the relationship between the
 430 interfaces and the mapping of specific Registry interfaces with specific Registry Client
 431 interfaces.

432 **6.4 Interfaces Exposed By The Registry**

433 When using the ebXML Messaging Services Specification, ebXML Registry Services
 434 elements correspond to Messaging Services elements as follows:

- 435 • The value of the Service element in the MessageHeader is an ebXML Registry
 436 Service interface name (e.g., "ObjectManager"). The type attribute of the Service
 437 element should have a value of "ebXMLRegistry".
- 438 • The value of the Action element in the MessageHeader is an ebXML Registry
 439 Service method name (e.g., "submitObjects").

440 Note that the above allows the Registry Client only one interface/method pair per
 441 message. This implies that a Registry Client can only invoke one method on a specified
 442 interface for a given request to a registry.

443 **6.4.1 Synchronous and Asynchronous Responses**

444 All methods on interfaces exposed by the registry return a response message.

- 445 • Asynchronous response
 - 446 ○ MessageHeader only;
 - 447 ○ No registry response element (e.g., AdHocQueryResponse and
 448 GetContentResponse).
- 449 • Synchronous response
 - 450 ○ MessageHeader;
 - 451 ○ Registry response element including
 - 452 ▪ a status attribute (success or failure)
 - 453 ▪ an optional ebXML Error.

454 The ebXML Registry implements the following interfaces as its services (Registry
 455 Services).

456 **6.4.2 Interface RegistryService**

457 _____
 458 This is the principal interface implemented by the Registry. It provides the methods that
 459 are used by the client to discover service-specific interfaces implemented by the
 460 Registry.
 461 _____

Method Summary of RegistryService

<code>ObjectManager</code>	<code>getObjectManager()</code>
----------------------------	---------------------------------

	Returns the ObjectManager interface implemented by the Registry service.
ObjectQueryManager	getObjectQueryManager() Returns the ObjectQueryManager interface implemented by the Registry service.

462 **6.4.3 Interface ObjectManager**

463

464 This is the interface exposed by the Registry Service that implements the Object life
 465 cycle management functionality of the Registry. Its methods are invoked by the Registry
 466 Client. For example, the client may use this interface to submit objects, to classify and
 467 associate objects and to deprecate and remove objects. For this specification the
 468 semantic meaning of submit, classify, associate, deprecate and remove is found in
 469 [ebRIM].

470

Method Summary of ObjectManager	
RegistryResponse	approveObjects(ApproveObjectsRequest req) Approves one or more previously submitted objects.
RegistryResponse	deprecateObjects(DeprecateObjectsRequest req) Deprecates one or more previously submitted objects.
RegistryResponse	removeObjects(RemoveObjectsRequest req) Removes one or more previously submitted objects from the Registry.
RegistryResponse	submitObjects(SubmitObjectsRequest req) Submits one or more objects and possibly related metadata such as Associations and Classifications.

RegistryResponse [addnuu.15 3s-7g 1.75 1.5 re5 re f 227.25 253.5 277.5D040 12 T4](#)

475 For example, the client may use this interface to perform browse and drill down queries
 476 or ad hoc queries on registry content.

477

Method Summary of ObjectQueryManager	
RegistryResponse	getClassificationTree (GetClassificationTreeRequest req) Returns the ClassificationNode Tree under the ClassificationNode specified in GetClassificationTreeRequest.
RegistryResponse	getClassifiedObjects (GetClassifiedObjectsRequest req) Returns a collection of references to RegistryEntries classified under specified ClassificationItem.
RegistryResponse	getContent () Returns the content of the specified Repository Item. The response includes all the content specified in the request as additional payloads within the response message.
RegistryResponse	getRootClassificationNodes (GetRootClassificationNodesRequest req) Returns all root ClassificationNodes that match the namePattern attribute in GetRootClassificationNodesRequest request.
RegistryResponse	submitAdhocQuery (AdhocQueryRequest req) Submit an ad hoc query request.

478 **6.5 Interfaces Exposed By Registry Clients**

479 An ebXML Registry client implements the following interface.

480 **6.5.1 Interface RegistryClient**

481

482 This is the principal interface implemented by a Registry client. The client provides this
 483 interface when creating a connection to the Registry. It provides the methods that are
 484 used by the Registry to deliver asynchronous responses to the client. Note that a client
 485 need not provide a RegistryClient interface if the [CPA] between the client and the
 486 registry does not support asynchronous responses.

487 The registry sends all asynchronous responses to operations to the onResponse
 488 method.

489

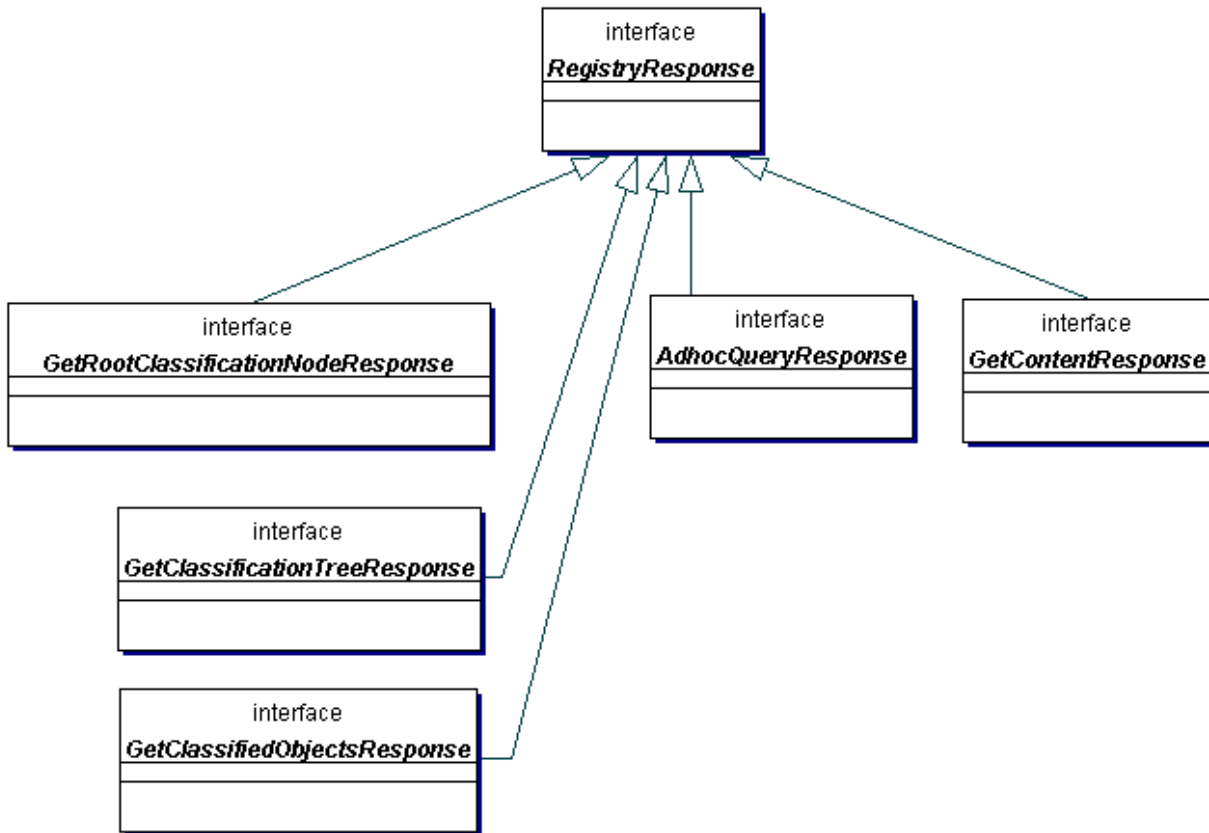
Method Summary of RegistryClient

void	onResponse (RegistryResponse resp) Notifies client of the response sent by registry to previously submitted request.
------	---

490

491 6.6 Registry Response Class Hierarchy

492 Since many of the responses from the registry have common attributes they are
 493 arranged in the following class hierarchy. This hierarchy is reflected in the registry DTD.



494

495 **Figure 3: Registry Reponse Class Hierarchy**

496

497

497
498

499

500 7 Object Management Service

501

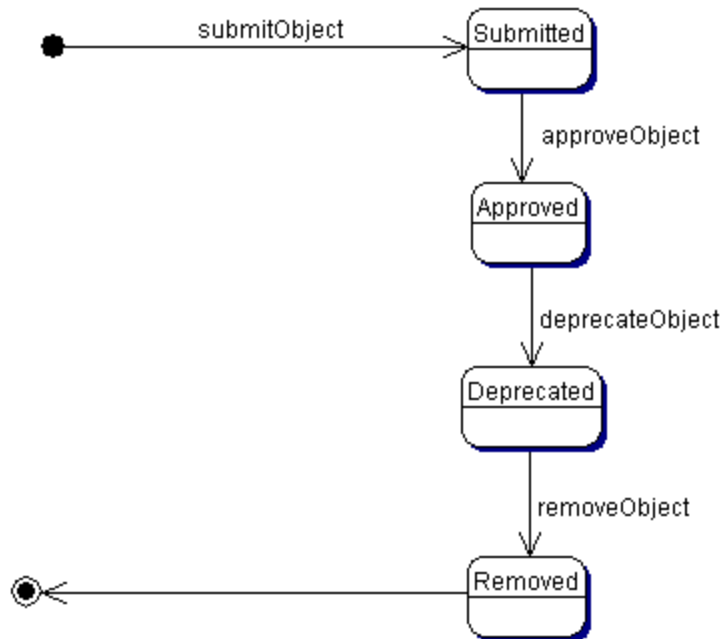
502 This section defines the ObjectManagement service of the Registry. The Object
503 Management Service is a sub-service of the Registry service. It provides the
504 functionality required by RegistryClients to manage the life cycle of repository items
505 (e.g. XML documents required for ebXML business processes). The Object
506 Management Service can be used with all types of repository items as well as the
507 metadata objects specified in [ebRIM] such as Classification and Association.

508 The minimum *security policy* for an ebXML registry is to accept content from any client if
509 the content is digitally signed by a certificate issued by a Certificate Authority
510 recognized by the ebXML registry. Submitting Organizations do not have to register
511 prior to submitting content.

512 7.1 Life Cycle of a Repository Item

513 The main purpose of the ObjectManagement service is to manage the life cycle of
514 repository items.

515 Figure 4 shows the typical life cycle of a repository item. Note that the current version of
516 this specification does not support Object versioning. Object versioning will be added in
517 a future version of this specification.



518

519

Figure 4: Life Cycle of a Repository Item

520 **7.2 RegistryObject Attributes**

521 A repository item is associated with a set of standard metadata defined as attributes of
 522 the RegistryObject class and its sub-classes as described in [ebRIM]. These attributes
 523 reside outside of the actual repository item and catalog descriptive information about the
 524 repository item. XML elements called ExtrinsicObject and IntrinsicObject (See Appendix
 525 A for details) encapsulate all object metadata attributes defined in [ebRIM] as XML
 526 attributes.

527 **7.3 The Submit Objects Protocol**

528 This section describes the protocol of the Registry Service that allows a RegistryClient
 529 to submit one or more repository items to the repository using the *ObjectManager* on
 530 behalf of a Submitting Organization. It is expressed in UML notation as described in
 531 Appendix B.

532



533

534

Figure 5: Submit Objects Sequence Diagram

535 For details on the schema for the *Business documents* shown in this process refer to
 536 Appendix A.

537 The SubmitObjectRequest message includes a RegistrEntryList element.

538 The RegistryEntryList element specifies one or more ExtrinsicObjects or other
 539 RegistryEntries such as Classifications, Associations, ExternalLinks, or Packages.

540 An ExtrinsicObject element provides required metadata about the content being
541 submitted to the Registry as defined by [ebRIM]. Note that these standard
542 ExtrinsicObject attributes are separate from the repository item itself, thus allowing the
543 ebXML Registry to catalog objects of any object type.

544 In the event of success, the registry sends a RegistryResponse with a status of
545 “success” back to the client. In the event of failure, the registry sends a
546 RegistryResponse with a status of “failure” back to the client.

547 **7.3.1 Universally Unique ID Generation**

548 As specified by [ebRIM], all objects in the registry have a unique id. The id must be a
549 *Universally Unique Identifier (UUID)* and must conform to the to the format of a URN
550 that specifies a DCE 128 bit UUID as specified in [UUID].

551 (e.g. urn:uuid:a2345678-1234-1234-123456789012)

552 This id is usually generated by the registry. The id attribute for submitted objects may
553 optionally be supplied by the client. If the client supplies the id and it conforms to the
554 format of a URN that specifies a DCE 128 bit UUID then the registry assumes that the
555 client wishes to specify the id for the object. In this case, the registry must honor a
556 client-supplied id and use it as the id attribute of the object in the registry. If the id is
557 found by the registry to not be globally unique, the registry must raise the error
558 condition: InvalidIdError.

559 If the client does not supply an id for a submitted object then the registry must generate
560 a universally unique id. Whether the id is generated by the client or whether it is
561 generated by the registry, it must be generated using the DCE 128 bit UUID generation
562 algorithm as specified in [UUID].

563 **7.3.2 ID Attribute And Object References**

564 The id attribute of an object may be used by other objects to reference the first object.
565 Such references are common both within the SubmitObjectsRequest as well as within
566 the registry. Within a SubmitObjectsRequest, the id attribute may be used to refer to an
567 object within the SubmitObjectsRequest as well as to refer to an object within the
568 registry. An object in the SubmitObjectsRequest that needs to be referred to within the
569 request document may be assigned an id by the submitter so that it can be referenced
570 within the request. The submitter may give the object a proper uuid URN, in which case
571 the id is permanently assigned to the object within the registry. Alternatively, the
572 submitter may assign an arbitrary id (not a proper uuid URN) as long as the id is unique
573 within the request document. In this case the id serves as a linkage mechanism within
574 the request document but must be ignored by the registry and replaced with a registry
575 generated id upon submission.

576 When an object in a SubmitObjectsRequest needs to reference an object that is already
 577 in the registry, the request must contain an ObjectRef element whose id attribute is the
 578 id of the object in the registry. This id is by definition a proper uuid URN. An ObjectRef
 579 may be viewed as a proxy within the request for an object that is in the registry.

580 7.3.3 Sample SubmitObjectsRequest

581 The following example shows several different use cases in a single
 582 SubmitObjectsRequest. It does not show the complete ebXML Message with the
 583 message header and additional payloads in the message for the repository items.

584 A SubmitObjectsRequest includes a RegistryEntryList which contains any number of
 585 objects that are being submitted. It may also contain any number of ObjectRefs to link
 586 objects being submitted to objects already within the registry.

```

587 <?xml version = "1.0" encoding = "UTF-8"?>
588 <!DOCTYPE SubmitObjectsRequest SYSTEM "file:///home/najmi/Registry.dtd">
589
590 <SubmitObjectsRequest>
591   <RegistryEntryList>
592
593     <!--
594     The following 3 objects package specified ExtrinsicObject in specified
595     Package, where both the Package and the ExtrinsicObject are
596     being submitted
597     -->
598     <Package id = "acmePackage1" name = "Package #1" description = "ACME's package #1"/>
599     <ExtrinsicObject id = "acmeCPP1" contentURI = "CPP1"
600       objectType = "CPP" name = "Widget Profile"
601       description = "ACME's profile for selling widgets"/>
602     <Association id = "acmePackage1-acmeCPP1-Assoc" associationType = "Packages"
603       sourceObject = "acmePackage1" targetObject = "acmeCPP1"/>
604
605     <!--
606     The following 3 objects package specified ExtrinsicObject in specified Package,
607     Where the Package is being submitted and the ExtrinsicObject is
608     already in registry
609     -->
610     <Package id = "acmePackage2" name = "Package #2" description = "ACME's package #2"/>
611     <ObjectRef id = "urn:uuid:a2345678-1234-1234-123456789012"/>
612     <Association id = "acmePackage2-alreadySubmittedCPP-Assoc"
613       associationType = "Packages" sourceObject = "acmePackage2"
614       targetObject = "urn:uuid:a2345678-1234-1234-123456789012"/>
615
616     <!--
617     The following 3 objects package specified ExtrinsicObject in specified Package,
618     where the Package and the ExtrinsicObject are already in registry
619     -->
620     <ObjectRef id = "urn:uuid:b2345678-1234-1234-123456789012"/>
621     <ObjectRef id = "urn:uuid:c2345678-1234-1234-123456789012"/>
622     <!-- id is unspecified implying that registry must create a uuid for this object -->
623     <Association associationType = "Packages"
624       sourceObject = "urn:uuid:b2345678-1234-1234-123456789012"
625       targetObject = "urn:uuid:c2345678-1234-1234-123456789012"/>
626
627     <!--
628     The following 3 objects externally link specified ExtrinsicObject using
629     specified ExternalLink, where both the ExternalLink and the ExtrinsicObject
630     are being submitted
631     -->
632     <ExternalLink id = "acmeLink1" name = "Link #1" description = "ACME's Link #1"/>
633     <ExtrinsicObject id = "acmeCPP2" contentURI = "CPP2" objectType = "CPP"
  
```

```
635     name = "Sprockets Profile" description = "ACME's profile for selling sprockets"/>
636 <Association id = "acmeLink1-acmeCPP2-Assoc" associationType = "ExternallyLinks"
637     sourceObject = "acmeLink1" targetObject = "acmeCPP2"/>
638
639 <!--
640 The following 2 objects externally link specified ExtrinsicObject using specified
641 ExternalLink, where the ExternalLink is being submitted and the ExtrinsicObject
642 is already in registry. Note that the targetObject points to an ObjectRef in a
643 previous line
644 -->
645 <ExternalLink id = "acmeLink2" name = "Link #2" description = "ACME's Link #2"/>
646 <Association id = "acmeLink2-alreadySubmittedCPP-Assoc"
647     associationType = "ExternallyLinks" sourceObject = "acmeLink2"
648     targetObject = "urn:uuid:a2345678-1234-1234-123456789012"/>
649
650 <!--
651 The following 2 objects externally identify specified ExtrinsicObject using specified
652 ExternalIdentifier, where the ExternalIdentifier is being submitted and the
653 ExtrinsicObject is already in registry. Note that the targetObject points to an
654 ObjectRef in a previous line
655 -->
656 <ExternalIdentifier id = "acmeDUNSID" name = "DUNS" description = "DUNS ID for ACME"
657     value = "13456789012"/>
658 <Association id = "acmeDUNSID-alreadySubmittedCPP-Assoc"
659     associationType = "ExternallyIdentifies" sourceObject = "acmeDUNSID"
660     targetObject = "urn:uuid:a2345678-1234-1234-123456789012"/>
661
662 <!--
663 The following show submission of a brand new classification scheme in its entirety
664 -->
665 <ClassificationNode id = "geographyNode" name = "Geography"
666     description = "The Geography scheme example from Registry Services Spec" />
667 <ClassificationNode id = "asiaNode" name = "Asia"
668     description = "The Asia node under the Geography node" parent="geographyNode" />
669 <ClassificationNode id = "japanNode" name = "Japan"
670     description = "The Japan node under the Asia node" parent="asiaNode" />
671 <ClassificationNode id = "koreaNode" name = "Korea"
672     description = "The Korea node under the Asia node" parent="asiaNode" />
673 <ClassificationNode id = "europeNode" name = "Europe"
674     description = "The Europe node under the Geography node" parent="geographyNode" />
675 <ClassificationNode id = "germanyNode" name = "Germany"
676     description = "The Germany node under the Asia node" parent="europeNode" />
677 <ClassificationNode id = "northAmericaNode" name = "North America"
678     description = "The North America node under the Geography node"
679     parent="geographyNode" />
680 <ClassificationNode id = "usNode" name = "US"
681     description = "The US node under the Asia node" parent="northAmericaNode" />
682
683 <!--
684 The following show submission of a Automotive sub-tree of ClassificationNodes that
685 gets added to an existing classification scheme named 'Industry'
686 that is already in the registry
687 -->
688 <ObjectRef id="urn:uuid:d2345678-1234-1234-123456789012" />
689 <ClassificationNode id = "automotiveNode" name = "Automotive"
690     description = "The Automotive sub-tree under Industry scheme"
691     parent = "urn:uuid:d2345678-1234-1234-123456789012"/>
692 <ClassificationNode id = "partSuppliersNode" name = "Parts Supplier"
693     description = "The Parts Supplier node under the Automotive node"
694     parent="automotiveNode" />
695 <ClassificationNode id = "engineSuppliersNode" name = "Engine Supplier"
696     description = "The Engine Supplier node under the Automotive node"
697     parent="automotiveNode" />
698
699 <!--
700 The following show submission of 2 Classifications of an object that is already in
701 the registry using 2 ClassificationNodes. One ClassificationNode
702 is being submitted in this request (Japan) while the other is already in the registry.
703 -->
704 <Classification id = "japanClassification"
```

```

705     description = "Classifies object by /Geography/Asia/Japan node"
706     classifiedObject="urn:uuid:a2345678-1234-1234-123456789012"
707     classificationNode="japanNode" />
708 <Classification id = "classificationUsingExistingNode"
709     description = "Classifies object using a node in the registry"
710     classifiedObject="urn:uuid:a2345678-1234-1234-123456789012"
711     classificationNode="urn:uuid:e2345678-1234-1234-123456789012" />
712 <ObjectRef id="urn:uuid:e2345678-1234-1234-123456789012" />
713
714
715 </RegistryEntryList>
716 </SubmitObjectsRequest>
    
```

717 **7.4 The Add Slots Protocol**

718 This section describes the protocol of the Registry Service that allows a client to add
 719 slots to a previously submitted registry entry using the ObjectManager. Slots provide a
 720 dynamic mechanism for extending registry entries as defined by [ebRIM].



721
 722 **Figure 7: Add Slots Sequence Diagram**

723 In the event of success, the registry sends a RegistryResponse with a status of
 724 “success” back to the client. In the event of failure, the registry sends a
 725 RegistryResponse with a status of “failure” back to the client.

726 **7.5 The Remove Slots Protocol**

727 This section describes the protocol of the Registry Service that allows a client to remove
 728 slots to a previously submitted registry entry using the ObjectManager.



729

730

Figure 8: Remove Slots Sequence Diagram

731 In the event of success, the registry sends a RegistryResponse with a status of
 732 “success” back to the client. In the event of failure, the registry sends a
 733 RegistryResponse with a status of “failure” back to the client.

734 **7.6 The Approve Objects Protocol**

735 This section describes the protocol of the Registry Service that allows a client to
 736 approve one or more previously submitted repository items using the ObjectManager.
 737 Once a repository item is approved it will become available for use by business parties
 738 (e.g. during the assembly of new CPAs and Collaboration Protocol Profiles).



739

740

Figure 9: Approve Objects Sequence Diagram

741 In the event of success, the registry sends a RegistryResponse with a status of
 742 “success” back to the client. In the event of failure, the registry sends a
 743 RegistryResponse with a status of “failure” back to the client.
 744 For details on the schema for the business documents shown in this process refer to
 745 Appendix A.

746 **7.7 The Deprecate Objects Protocol**

747 This section describes the protocol of the Registry Service that allows a client to
 748 deprecate one or more previously submitted repository items using the ObjectManager.
 749 Once an object is deprecated, no new references (e.g. *newAssociations*,
 750 *Classifications* and *ExternalLinks*) to that object can be submitted. However, existing
 751 references to a deprecated object continue to function normally.



752
 753 **Figure 10: Deprecate Objects Sequence Diagram**

754 In the event of success, the registry sends a RegistryResponse with a status of
 755 “success” back to the client. In the event of failure, the registry sends a
 756 RegistryResponse with a status of “failure” back to the client.
 757 For details on the schema for the business documents shown in this process refer to
 758 Appendix A.

759 **7.8 The Remove Objects Protocol**

760 This section describes the protocol of the Registry Service that allows a client to remove
 761 one or more RegistryEntry instances and/or repository items using the ObjectManager.
 762 The RemoveObjectsRequest message is sent by a client to remove RegistryEntry
 763 instances and/or repository items. The RemoveObjectsRequest element includes an
 764 XML attribute called *deletionScope* which is an enumeration that can have the values as
 765 defined by the following sections.

766 **7.8.1 Deletion Scope DeleteRepositoryItemOnly**

767 This deletionScope specifies that the request should delete the repository items for the
 768 specified registry entries but not delete the specified registry entries. This is useful in
 769 keeping references to the registry entries valid.

770 **7.8.2 Deletion Scope DeleteAll**

771 This deletionScope specifies that the request should delete both the RegistryEntry and
 772 the repository item for the specified registry entries. Only if all references (e.g.
 773 Associations, Classifications, ExternalLinks) to a RegistryEntry have been removed, can
 774 that RegistryEntry then be removed using a RemoveObjectsRequest with
 775 deletionScope DeleteAll. Attempts to remove a RegistryEntry while it still has references
 776 raises an error condition: InvalidRequestError.

777 The remove object protocol is expressed in UML notation as described in Appendix B.



778
 779 **Figure 11: Remove Objects Sequence Diagram**

780 In the event of success, the registry sends a RegistryResponse with a status of
 781 “success” back to the client. In the event of failure, the registry sends a
 782 RegistryResponse with a status of “failure” back to the client.

783 For details on the schema for the business documents shown in this process refer to
 784 Appendix A.

785 **8 Object Query Management Service**

786 This section describes the capabilities of the Registry Service that allow a client
 787 (ObjectQueryManagerClient) to search for or query RegistryEntries in the ebXML
 788 Registry using the ObjectQueryManager interface of the Registry.

789 The Registry supports multiple query capabilities. These include the following:

- 790 1. Browse and Drill Down Query
- 791 2. Filtered Query
- 792 3. SQL Query

793 The browse and drill down query in Section 8.1 and the filtered query mechanism in
 794 Section 8.2 SHALL be supported by every Registry implementation. The SQL query
 795 mechanism is an optional feature and MAY be provided by a registry implementation.
 796 However, if a vendor provides an SQL query capability to an ebXML Registry it SHALL
 797 conform to this document. As such this capability is a normative yet optional capability.

798 In a future version of this specification, the W3C XQuery syntax may be considered as
 799 another query syntax.

800 Any errors in the query request messages are indicated in the corresponding query
 801 response message.

802 8.1 Browse and Drill Down Query Support

803 The browse and drill down query style is supported by a set of interaction protocols
 804 between the ObjectQueryManagerClient and the ObjectQueryManager. Sections 8.1.1,
 805 8.1.2 and 8.1.3 describe these protocols.

806 8.1.1 Get Root Classification Nodes Request

807 An ObjectQueryManagerClient sends this request to get a list of root
 808 ClassificationNodes defined in the repository. Root classification nodes are defined as
 809 nodes that have no parent. Note that it is possible to specify a namePattern attribute
 810 that can filter on the name attribute of the root ClassificationNodes. The namePattern
 811 must be specified using a wildcard pattern defined by SQL-92 LIKE clause as defined
 812 by [SQL].



813

814

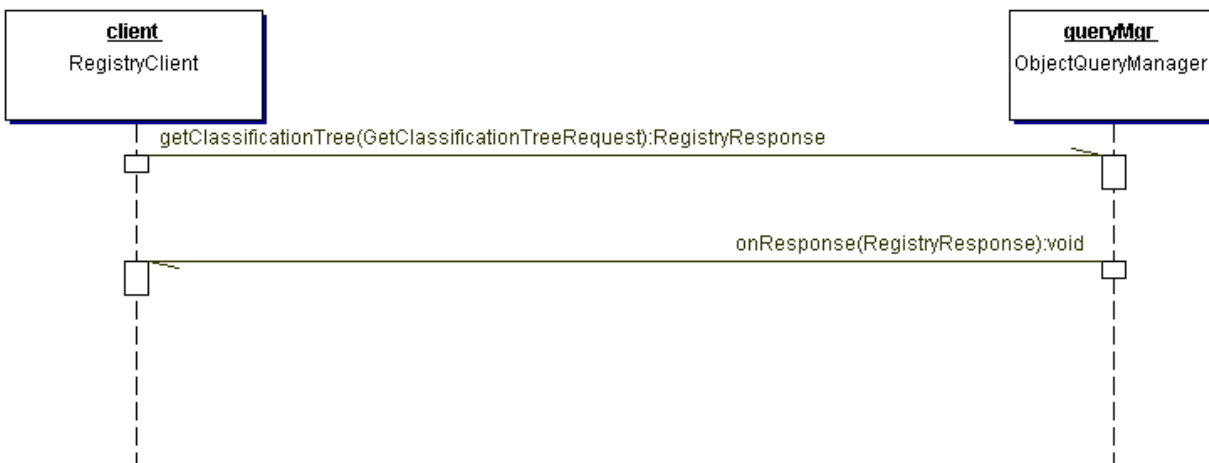
Figure 12: Get Root Classification Nodes Sequence Diagram

815 In the event of success, the registry sends a `GetRootClassificationNodeResponse` with
 816 a status of “success” back to the client. In the event of failure, the registry sends a
 817 `GetRootClassificationNodeResponse` with a status of “failure” back to the client.
 818 For details on the schema for the business documents shown in this process refer to
 819 Appendix A.

820 **8.1.2 Get Classification Tree Request**

821 An `ObjectQueryManagerClient` sends this request to get the `ClassificationNode` sub-tree
 822 defined in the repository under the `ClassificationNodes` specified in the request. Note
 823 that a `GetClassificationTreeRequest` can specify an integer attribute called *depth* to get
 824 the sub-tree up to the specified depth. If *depth* is the default value of 1, then only the
 825 immediate children of the specified `ClassificationNodeList` are returned. If *depth* is 0 or a
 826 negative number then the entire sub-tree is retrieved.

827



828

829 **Figure 14: Get Classification Tree Sequence Diagram**

830 In the event of success, the registry sends a `GetClassificationTreeResponse` with a
 831 status of “success” back to the client. In the event of failure, the registry sends a
 832 `GetClassificationTreeResponse` with a status of “failure” back to the client.

833 For details on the schema for the business documents shown in this process refer to
 834 Appendix A.

835 **8.1.3 Get Classified Objects Request**

836 An `ObjectQueryManagerClient` sends this request to get a list of `RegistryEntries` that are
 837 classified by all of the specified `ClassificationNodes` (or any of their descendants), as
 838 specified by the `ObjectRefList` in the request.

839 It is possible to get `RegistryEntries` based on matches with multiple classifications. Note
 840 that specifying a `ClassificationNode` is implicitly specifying a logical OR with all
 841 descendants of the specified `ClassificationNode`.

842 When a GetClassifiedObjectsRequest is sent to the ObjectQueryManager it should
 843 return Objects that are:

- 844 1. Either directly classified by the specified ClassificationNode
- 845 2. Or are directly classified by a descendant of the specified ClassificationNode

846 **8.1.3.1 Get Classified Objects Request Example**



847
 848 **Figure 16: A Sample Geography Classification**

849 Let us say a classification tree has the structure shown in Figure 16:

- 850 • If the Geography node is specified in the GetClassifiedObjectsRequest then the
 851 GetClassifiedObjectsResponse should include all RegistryEntries that are directly
 852 classified by Geography *or* North America *or* US *or* Asia *or* Japan *or* Korea *or*
 853 Europe *or* Germany.
- 854 • If the Asia node is specified in the GetClassifiedObjectsRequest then the
 855 GetClassifiedObjectsResponse should include all RegistryEntries that are directly
 856 classified by Asia *or* Japan *or* Korea.
- 857 • If the Japan *and* Korea nodes are specified in the GetClassifiedObjectsRequest
 858 then the GetClassifiedObjectsResponse should include all RegistryEntries that
 859 are directly classified by both Japan *and* Korea.
- 860 • If the North America *and* Asia node is specified in the
 861 GetClassifiedObjectsRequest then the GetClassifiedObjectsResponse should
 862 include all RegistryEntries that are directly classified by (North America *or* US)
 863 *and* (Asia *or* Japan *or* Korea).



864

865

Figure 17: Get Classified Objects Sequence Diagram

866 In the event of success, the registry sends a GetClassifiedObjectsResponse with a
867 status of “success” back to the client. In the event of failure, the registry sends a
868 GetClassifiedObjectsResponse with a status of “failure” back to the client.

8.2 Filter Query Support

869

870 FilterQuery is an XML syntax that provides simple query capabilities for any ebXML
 871 conforming Registry implementation. Each query alternative is directed against a single
 872 class defined by the ebXML Registry Information Model (ebRIM). The result of such a
 873 query is a set of identifiers for instances of that class. A FilterQuery may be a stand-
 874 alone query or it may be the initial action of a ReturnRegistryEntry query or a
 875 ReturnRepositoryItem query.

876 A client submits a FilterQuery, a ReturnRegistryEntry query, or a ReturnRepositoryItem
 877 query to the ObjectQueryManager as part of an AdhocQueryRequest. The
 878 ObjectQueryManager sends an AdhocQueryResponse back to the client, enclosing the
 879 appropriate FilterQueryResponse, ReturnRegistryEntryResponse, or
 880 ReturnRepositoryItemResponse specified herein. The sequence diagrams for
 881 AdhocQueryRequest and AdhocQueryResponse are specified in Section 8.4.

882 Each FilterQuery alternative is associated with an ebRIM Binding that identifies a
 883 hierarchy of classes derived from a single class and its associations with other classes
 884 as defined by ebRIM. Each choice of a class pre-determines a virtual XML document
 885 that can be queried as a tree. For example, let C be a class, let Y and Z be classes that
 886 have direct associations to C, and let V be a class that is associated with Z. The ebRIM
 887 Binding for C might be as in Figure 19.

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897

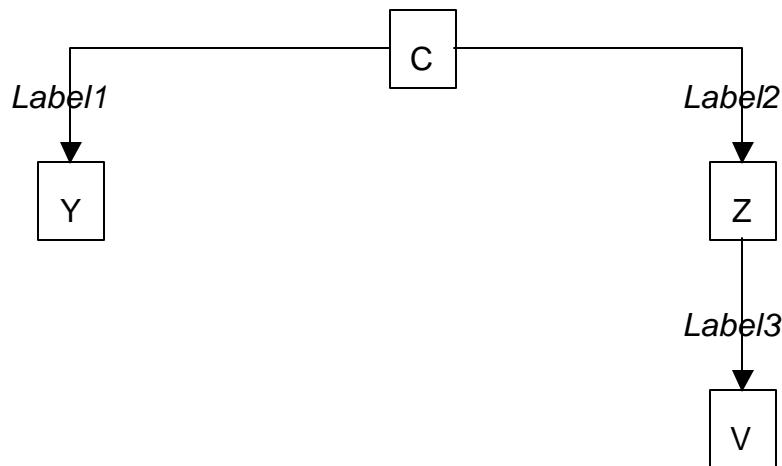


Figure 19: Example ebRIM Binding

898 Label1 identifies an association from C to Y, Label2 identifies an association from C to
 899 Z, and Label3 identifies an association from Z to V. Labels can be omitted if there is no
 900 ambiguity as to which ebRIM association is intended. The name of the query is
 901 determined by the root class, i.e. this is an ebRIM Binding for a CQuery. The Y node in
 902 the tree is limited to the set of Y instances that are linked to C by the association
 903 identified by Label1. Similarly, the Z and V nodes are limited to instances that are linked
 904 to their parent node by the identified association.

905 Each FilterQuery alternative depends upon one or more *class filters*, where a class filter
906 is a restricted *predicate clause* over the attributes of a single class. The supported class
907 filters are specified in Section 8.2.9 and the supported predicate clauses are defined in
908 Section 8.2.10. A FilterQuery will be composed of elements that traverse the tree to
909 determine which branches satisfy the designated class filters, and the query result will
910 be the set of root node instances that support such a branch.

911 In the above example, the CQuery element will have three subelements, one a CFilter
912 on the C class to eliminate C instances that do not satisfy the predicate of the CFilter,
913 another a YFilter on the Y class to eliminate branches from C to Y where the target of
914 the association does not satisfy the YFilter, and a third to eliminate branches along a
915 path from C through Z to V. The third element is called a *branch* element because it
916 allows class filters on each class along the path from X to V. In general, a branch
917 element will have subelements that are themselves class filters, other branch elements,
918 or a full-blown query on the terminal class in the path.

919 If an association from a class C to a class Y is one-to-zero or one-to-one, then at most
920 one branch or filter element on Y is allowed. However, if the association is one-to-many,
921 then multiple filter or branch elements are allowed. This allows one to specify that an
922 instance of C must have associations with multiple instances of Y before the instance of
923 C is said to satisfy the branch element.

924 The FilterQuery syntax is tied to the structures defined in ebRIM. Since ebRIM is
925 intended to be stable, the FilterQuery syntax is stable. However, if new structures are
926 added to the ebRIM, then the FilterQuery syntax and semantics can be extended at the
927 same time.

928 Support for FilterQuery is required of every conforming ebXML Registry implementation,
929 but other query options are possible. The Registry will hold a self-describing CPP that
930 identifies all supported AdhocQuery options. This profile is described in Section 6.1.

931 The ebRIM Binding paragraphs in Sections 8.2.2 through 8.2.6 below identify the virtual
932 hierarchy for each FilterQuery alternative. The Semantic Rules for each query
933 alternative specify the effect of that binding on query semantics.

934 The ReturnRegistryEntry and ReturnRepositoryItem services defined below provide a
935 way to structure an XML document as an expansion of the result of a
936 RegistryEntryQuery. The ReturnRegistryEntry element specified in Section 8.2.7 allows
937 one to specify what metadata one wants returned with each registry entry identified in
938 the result of a RegistryEntryQuery. The ReturnRepositoryItem specified in Section
939 8.2.8 allows one to specify what repository items one wants returned based on their
940 relationships to the registry entries identified by the result of a RegistryEntryQuery.
941

941 **8.2.1 FilterQuery**942 **Purpose**

943 To identify a set of registry instances from a specific registry class. Each alternative
 944 assumes a specific binding to ebRIM. The query result for each query alternative is a
 945 set of references to instances of the root class specified by the binding. The status is a
 946 success indication or a collection of warnings and/or exceptions.

947 **Definition**

```

948
949 <!ELEMENT FilterQuery
950   (
951     | RegistryEntryQuery
952     | AuditableEventQuery
953     | ClassificationNodeQuery
954     | RegistryPackageQuery
955     | OrganizationQuery          )>
956
957 <!ELEMENT FilterQueryResult
958   (
959     | RegistryEntryQueryResult
960     | AuditableEventQueryResult
961     | ClassificationNodeQueryResult
962     | RegistryPackageQueryResult
963     | OrganizationQueryResult  )>
964
965 <!ELEMENT RegistryEntryQueryResult ( RegistryEntryView* )>
966
967 <!ELEMENT RegistryEntryView EMPTY >
968 <!ATTLIST RegistryEntryView
969   objectURN      CDATA      #REQUIRED
970   contentURI     CDATA      #IMPLIED
971   objectID       CDATA      #IMPLIED >
972
973 <!ELEMENT AuditableEventQueryResult ( AuditableEventView* )>
974
975 <!ELEMENT AuditableEventView EMPTY >
976 <!ATTLIST AuditableEventView
977   objectID       CDATA      #REQUIRED
978   timestamp      CDATA      #REQUIRED >
979
980 <!ELEMENT ClassificationNodeQueryResult
981   (ClassificationNodeView*)>
982
983 <!ELEMENT ClassificationNodeView EMPTY >
984 <!ATTLIST ClassificationNodeView
985   objectURN      CDATA      #REQUIRED
986   contentURI     CDATA      #IMPLIED
987   objectID       CDATA      #IMPLIED >
988
989 <!ELEMENT RegistryPackageQueryResult ( RegistryPackageView* )>
990
991 <!ELEMENT RegistryPackageView EMPTY >
992 <!ATTLIST RegistryPackageView

```

```
991      objectURN      CDATA      #REQUIRED
992      contentURI     CDATA      #IMPLIED
993      objectID       CDATA      #IMPLIED >
994
995      <!ELEMENT OrganizationQueryResult ( OrganizationView* )>
996
997      <!ELEMENT OrganizationView EMPTY >
998      <!ATTLIST OrganizationView
999          orgURN      CDATA      #REQUIRED
1000         objectID     CDATA      #IMPLIED >
1001
1002
```

1003 **Semantic Rules**

- 1004 1. The semantic rules for each FilterQuery alternative are specified in subsequent
1005 subsections.
 - 1006 2. Each FilterQueryResult is a set of XML reference elements to identify each instance
1007 of the result set. Each XML attribute carries a value derived from the value of an
1008 attribute specified in the Registry Information Model as follows:
 - 1009 a) objectID is the value of the ID attribute of the RegistryObject class,
 - 1010 b) objectURN and orgURN are URN values derived from the object ID,
 - 1011 c) contentURI is a URL value derived from the contentURI attribute of the
1012 RegistryEntry class,
 - 1013 d) timestamp is a literal value to represent the value of the timestamp attribute of
1014 the AuditableEvent class.
 - 1015 3. If an error condition is raised during any part of the execution of a FilterQuery, then
1016 the status attribute of the XML RegistryResult is set to “failure” and no query result
1017 element is returned; instead, a RegistryErrorList element must be returned with its
1018 highestSeverity element set to “error”. At least one of the RegistryError elements in
1019 the RegistryErrorList will have its severity attribute set to “error”.
 - 1020 4. If no error conditions are raised during execution of a FilterQuery, then the status
1021 attribute of the XML RegistryResult is set to “success” and an appropriate query
1022 result element must be included. If a RegistryErrorList is also returned, then the
1023 highestSeverity attribute of the RegistryErrorList is set to “warning” and the serverity
1024 attribute of each RegistryError is set to “warning”.
- 1025
- 1026
- 1027

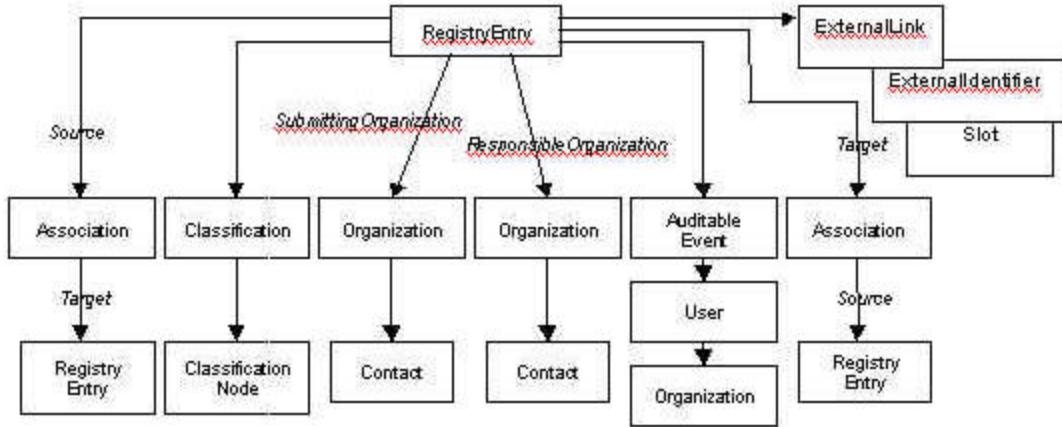
1027 **8.2.2 RegistryEntryQuery**

1028 **Purpose**

1029 To identify a set of registry entry instances as the result of a query over selected registry
 1030 metadata.

1031 **ebRIM Binding**

1032



1033

1034 **Definition**

1035

```

1036 <!ELEMENT RegistryEntryQuery
1037   ( RegistryEntryFilter?,
1038     SourceAssociationBranch*,
1039     TargetAssociationBranch*,
1040     HasClassificationBranch*,
1041     SubmittingOrganizationBranch?,
1042     ResponsibleOrganizationBranch?,
1043     ExternalIdentifierFilter*,
1044     ExternalLinkFilter*,
1045     SlotFilter*,
1046     HasAuditableEventBranch* )>
1047
1048 <!ELEMENT SourceAssociationBranch
1049   ( AssociationFilter?,
1050     RegistryEntryFilter? )>
1051
1052 <!ELEMENT TargetAssociationBranch
1053   ( AssociationFilter?,
1054     RegistryEntryFilter? )>
1055
1056 <!ELEMENT HasClassificationBranch
1057   ( ClassificationFilter?,
1058     ClassificationNodeFilter? )>
    
```

```
1059
1060 <!ELEMENT SubmittingOrganizationBranch
1061 ( OrganizationFilter?,
1062 ContactFilter? )>
1063
1064 <!ELEMENT ResponsibleOrganizationBranch
1065 ( OrganizationFilter?,
1066 ContactFilter? )>
1067
1068 <!ELEMENT HasAuditableEventBranch
1069 ( AuditableEventFilter?,
1070 UserFilter?,
1071 OrganizationFilter? )>
```

1072 **Semantic Rules**

- 1073 1. Let RE denote the set of all persistent RegistryEntry instances in the Registry. The
1074 following steps will eliminate instances in RE that do not satisfy the conditions of the
1075 specified filters.
- 1076 a) If a RegistryEntryFilter is not specified, or if RE is empty, then continue below;
1077 otherwise, let x be a registry entry in RE. If x does not satisfy the
1078 RegistryEntryFilter as defined in Section 8.2.9, then remove x from RE.
- 1079 b) If a SourceAssociationBranch element is not specified, or if RE is empty, then
1080 continue below; otherwise, let x be a remaining registry entry in RE. If x is not the
1081 source object of some Association instance, then remove x from RE; otherwise,
1082 treat each SourceAssociationBranch element separately as follows:
- 1083 If no AssociationFilter is specified within SourceAssociationBranch, then let AF
1084 be the set of all Association instances that have x as a source object; otherwise,
1085 let AF be the set of Association instances that satisfy the AssociationFilter and
1086 have x as the source object. If AF is empty, then remove x from RE. If no
1087 RegistryEntryFilter is specified within SourceAssociationBranch, then let RET be
1088 the set of all RegistryEntry instances that are the target object of some element
1089 of AF; otherwise, let RET be the set of RegistryEntry instances that satisfy the
1090 RegistryEntryFilter and are the target object of some element of AF. If RET is
1091 empty, then remove x from RE.
- 1092 c) If a TargetAssociationBranch element is not specified, or if RE is empty, then
1093 continue below; otherwise, let x be a remaining registry entry in RE. If x is not the
1094 target object of some Association instance, then remove x from RE; otherwise,
1095 treat each TargetAssociationBranch element separately as follows:

- 1096 If no AssociationFilter is specified within TargetAssociationBranch, then let AF be
1097 the set of all Association instances that have x as a target object; otherwise, let
1098 AF be the set of Association instances that satisfy the AssociationFilter and have
1099 x as the target object. If AF is empty, then remove x from RE. If no
1100 RegistryEntryFilter is specified within TargetAssociationBranch, then let RES be
1101 the set of all RegistryEntry instances that are the source object of some element
1102 of AF; otherwise, let RES be the set of RegistryEntry instances that satisfy the
1103 RegistryEntryFilter and are the source object of some element of AF. If RES is
1104 empty, then remove x from RE.
- 1105 d) If a HasClassificationBranch element is not specified, or if RE is empty, then
1106 continue below; otherwise, let x be a remaining registry entry in RE. If x is not the
1107 source object of some Classification instance, then remove x from RE; otherwise,
1108 treat each HasClassificationBranch element separately as follows:
- 1109 If no ClassificationFilter is specified within the HasClassificationBranch, then let
1110 CL be the set of all Classification instances that have x as a source object;
1111 otherwise, let CL be the set of Classification instances that satisfy the
1112 ClassificationFilter and have x as the source object. If CL is empty, then remove
1113 x from RE. If no ClassificationNodeFilter is specified within
1114 HasClassificationBranch, then let CN be the set of all ClassificationNode
1115 instances that are the target object of some element of CL; otherwise, let CN be
1116 the set of RegistryEntry instances that satisfy the ClassificationNodeFilter and
1117 are the target object of some element of CL. If CN is empty, then remove x from
1118 RE.
- 1119 e) If a SubmittingOrganizationBranch element is not specified, or if RE is empty,
1120 then continue below; otherwise, let x be a remaining registry entry in RE. If x
1121 does not have a submitting organization, then remove x from RE. If no
1122 OrganizationFilter is specified within SubmittingOrganizationBranch, then let SO
1123 be the set of all Organization instances that are the submitting organization for x;
1124 otherwise, let SO be the set of Organization instances that satisfy the
1125 OrganizationFilter and are the submitting organization for x. If SO is empty, then
1126 remove x from RE. If no ContactFilter is specified within
1127 SubmittingOrganizationBranch, then let CT be the set of all Contact instances
1128 that are the contacts for some element of SO; otherwise, let CT be the set of
1129 Contact instances that satisfy the ContactFilter and are the contacts for some
1130 element of SO. If CT is empty, then remove x from RE.

- 1131 f) If a ResponsibleOrganizationBranch element is not specified, or if RE is empty,
1132 then continue below; otherwise, let x be a remaining registry entry in RE. If x
1133 does not have a responsible organization, then remove x from RE. If no
1134 OrganizationFilter is specified within ResponsibleOrganizationBranch, then let
1135 RO be the set of all Organization instances that are the responsible organization
1136 for x; otherwise, let RO be the set of Organization instances that satisfy the
1137 OrganizationFilter and are the responsible organization for x. If RO is empty, then
1138 remove x from RE. If no ContactFilter is specified within
1139 SubmittingOrganizationBranch, then let CT be the set of all Contact instances
1140 that are the contacts for some element of RO; otherwise, let CT be the set of
1141 Contact instances that satisfy the ContactFilter and are the contacts for some
1142 element of RO. If CT is empty, then remove x from RE.
- 1143 g) If an ExternalLinkFilter element is not specified, or if RE is empty, then continue
1144 below; otherwise, let x be a remaining registry entry in RE. If x is not linked to
1145 some ExternalLink instance, then remove x from RE; otherwise, treat each
1146 ExternalLinkFilter element separately as follows:
1147 Let EL be the set of ExternalLink instances that satisfy the ExternalLinkFilter and
1148 are linked to x. If EL is empty, then remove x from RE.
- 1149 h) If an ExternalIdentifierFilter element is not specified, or if RE is empty, then
1150 continue below; otherwise, let x be a remaining registry entry in RE. If x is not
1151 linked to some ExternalIdentifier instance, then remove x from RE; otherwise,
1152 treat each ExternalIdentifierFilter element separately as follows:
1153 Let EI be the set of ExternalIdentifier instances that satisfy the
1154 ExternalIdentifierFilter and are linked to x. If EI is empty, then remove x from RE.
- 1155 i) If a SlotFilter element is not specified, or if RE is empty, then continue below;
1156 otherwise, let x be a remaining registry entry in RE. If x is not linked to some Slot
1157 instance, then remove x from RE; otherwise, treat each SlotFilter element
1158 separately as follows:
1159 Let SL be the set of Slot instances that satisfy the SlotFilter and are linked to x. If
1160 SL is empty, then remove x from RE.
- 1161 j) If a HasAuditableEventBranch element is not specified, or if RE is empty, then
1162 continue below; otherwise, let x be a remaining registry entry in RE. If x is not
1163 linked to some AuditableEvent instance, then remove x from RE; otherwise, treat
1164 each HasAuditableEventBranch element separately as follows:
1165 If an AuditableEventFilter is not specified within HasAuditableEventBranch, then
1166 let AE be the set of all AuditableEvent instances for x; otherwise, let AE be the
1167 set of AuditableEvent instances that satisfy the AuditableEventFilter and are
1168 auditable events for x. If AE is empty, then remove x from RE. If a UserFilter is
1169 not specified within HasAuditableEventBranch, then let AI be the set of all User
1170 instances linked to an element of AE; otherwise, let AI be the set of User
1171 instances that satisfy the UserFilter and are linked to an element of AE.

1172 If AI is empty, then remove x from RE. If an OrganizationFilter is not specified
1173 within HasAuditableEventBranch, then let OG be the set of all Organization
1174 instances that are linked to an element of AI; otherwise, let OG be the set of
1175 Organization instances that satisfy the OrganizationFilter and are linked to an
1176 element of AI. If OG is empty, then remove x from RE.

1177 2. If RE is empty, then raise the warning: *registry entry query result is empty*.

1178 3. Return RE as the result of the RegistryEntryQuery.

1179

1180 Examples

1181 A client wants to establish a trading relationship with XYZ Corporation and wants to
1182 know if they have registered any of their business documents in the Registry. The
1183 following query returns a set of registry entry identifiers for currently registered items
1184 submitted by any organization whose name includes the string "XYZ". It does not return
1185 any registry entry identifiers for superseded, replaced, deprecated, or withdrawn items.

```
1186  
1187 <RegistryEntryQuery>  
1188   <RegistryEntryFilter>  
1189     status EQUAL "Approved"           -- code by Clause, Section 8.2.10  
1190   </RegistryEntryFilter>  
1191   <SubmittingOrganizationBranch>  
1192     <OrganizationFilter>  
1193       name CONTAINS "XYZ"           -- code by Clause, Section 8.2.10  
1194     </OrganizationFilter>  
1195   </SubmittingOrganizationBranch>  
1196 </RegistryEntryQuery>  
1197
```

1198 A client is using the United Nations Standard Product and Services Classification
1199 (UNSPSC) scheme and wants to identify all companies that deal with products
1200 classified as "Integrated circuit components", i.e. UNSPSC code "321118". The client
1201 knows that companies have registered their party profile documents in the Registry, and
1202 that each profile has been classified by the products the company deals with. The
1203 following query returns a set of registry entry identifiers for profiles of companies that
1204 deal with integrated circuit components.

```
1205  
1206 <RegistryEntryQuery>  
1207   <RegistryEntryFilter>  
1208     objectType EQUAL "CPP" AND       -- code by Clause, Section 8.2.10  
1209     status EQUAL "Approved"  
1210   </RegistryEntryFilter>  
1211   <HasClassificationBranch>  
1212     <ClassificationNodeFilter>  
1213       id STARTSWITH "urn:un:spsc:321118" -- code by Clause, Section 8.2.10  
1214     </ClassificationNodeFilter>  
1215   </HasClassificationBranch>  
1216 </RegistryEntryQuery>
```


1217 A client application needs all items that are classified by two different classification
1218 schemes, one based on "Industry" and another based on "Geography". Both schemes
1219 have been defined by ebXML and are registered. The root nodes of each scheme are
1220 identified by "urn:ebxml:cs:industry" and "urn:ebxml:cs:geography", respectively. The
1221 following query identifies registry entries for all registered items that are classified by
1222 "Industry/Automotive" and by "Geography/Asia/Japan".

```
1223
1224 <RegistryEntryQuery>
1225   <HasClassificationBranch>
1226     <ClassificationNodeFilter>
1227       id STARTSWITH "urn:ebxml:cs:industry" AND
1228       path EQUAL "Industry/Automotive"      -- code by Clause, Section 8.2.10
1229     </ClassificationNodeFilter>
1230     <ClassificationNodeFilter>
1231       id STARTSWITH "urn:ebxml:cs:geography" AND
1232       path EQUAL "Geography/Asia/Japan"    -- code by Clause, Section 8.2.10
1233     </ClassificationNodeFilter>
1234   </HasClassificationBranch>
1235 </RegistryEntryQuery>
```

1236 A client application wishes to identify all registry Package instances that have a given
1237 registry entry as a member of the package. The following query identifies all registry
1238 packages that contain the registry entry identified by URN "urn:path:myitem" as a
1239 member:

```
1240
1241 <RegistryEntryQuery>
1242   <RegistryEntryFilter>
1243     objectType EQUAL "RegistryPackage"      -- code by Clause, Section 8.2.10
1244   </RegistryEntryFilter>
1245   <SourceAssociationBranch>
1246     <AssociationFilter>                    -- code by Clause, Section 8.2.10
1247       associationType EQUAL "HasMember" AND
1248       targetObject EQUAL "urn:path:myitem"
1249     </AssociationFilter>
1250   </SourceAssociationBranch>
1251 </RegistryEntryQuery>
```

1252 A client application wishes to identify all ClassificationNode instances that have some
1253 given keyword as part of their name or description. The following query identifies all
1254 registry classification nodes that contain the keyword "transistor" as part of their name
1255 or as part of their description.

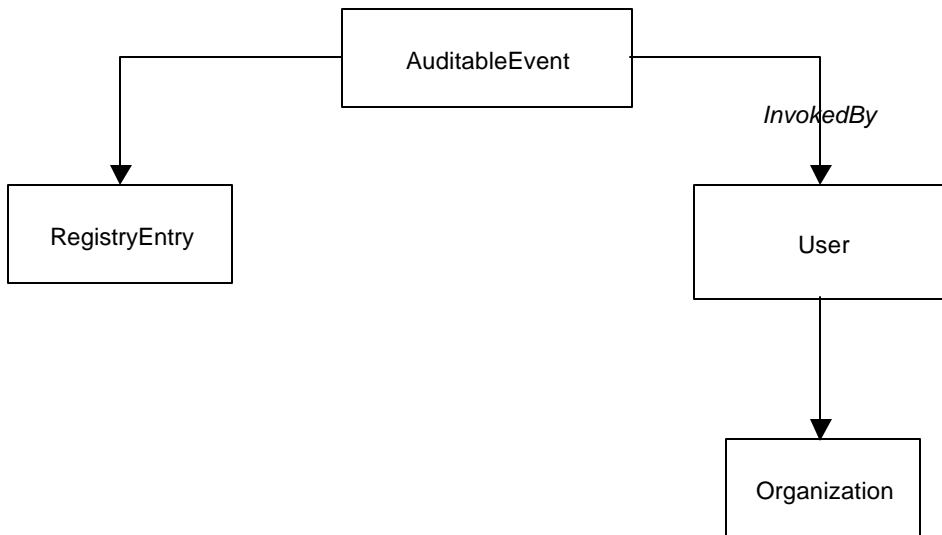
```
1256
1257 <RegistryEntryQuery>
1258   <RegistryEntryFilter>
1259     ObjectType="ClassificationNode" AND
1260     (name CONTAINS "transistor" OR        -- code by Clause, Section 8.2.10
1261      description CONTAINS "transistor")
1262   </RegistryEntryFilter>
1263 </RegistryEntryQuery>
1264
```

1264 **8.2.3 AuditableEventQuery**

1265 **Purpose**

1266 To identify a set of auditable event instances as the result of a query over selected
 1267 registry metadata.

1268 ebRIM Binding



1269 **Definition**

```

1270
1271 <!ELEMENT AuditableEventQuery
1272 ( AuditableEventFilter?,
1273 RegistryEntryQuery*,
1274 InvokedByBranch? )>
1275
1276 <!ELEMENT InvokedByBranch
1277 ( UserFilter?,
1278 OrganizationQuery? )>
    
```

1279

1280 **Semantic Rules**

- 1281 1. Let AE denote the set of all persistent AuditableEvent instances in the Registry. The
 1282 following steps will eliminate instances in AE that do not satisfy the conditions of the
 1283 specified filters.

1284

- 1285 a) If an AuditableEventFilter is not specified, or if AE is empty, then continue below;
 1286 otherwise, let x be an auditable event in AE. If x does not satisfy the
 1287 AuditableEventFilter as defined in Section 8.2.9, then remove x from AE.
- 1288 b) If a RegistryEntryQuery element is not specified, or if AE is empty, then continue
 1289 below; otherwise, let x be a remaining auditable event in AE. Treat each
 1290 RegistryEntryQuery element separately as follows:
 1291 Let RE be the result set of the RegistryEntryQuery as defined in Section 8.2.2. If
 1292 x is not an auditable event for some registry entry in RE, then remove x from AE.
- 1293 c) If an InvokedByBranch element is not specified, or if AE is empty, then continue
 1294 below; otherwise, let x be a remaining auditable event in AE.
- 1295 Let u be the user instance that invokes x. If a UserFilter element is specified within the
 1296 InvokedByBranch, and if u does not satisfy that filter, then remove x from AE; otherwise,
 1297 continue below.
- 1298 If an OrganizationQuery element is not specified within the InvokedByBranch,
 1299 then continue below; otherwise, let OG be the set of Organization instances that
 1300 are identified by the organization attribute of u and are in the result set of the
 1301 OrganizationQuery. If OG is empty, then remove x from AE.
- 1302 2. If AE is empty, then raise the warning: *auditable event query result is empty*.
- 1303 3. Return AE as the result of the AuditableEventQuery.

1304

1305 Examples

1306 A Registry client has registered an item and it has been assigned a URN identifier
 1307 "urn:path:myitem". The client is now interested in all events since the beginning of the
 1308 year that have impacted that item. The following query will return a set of
 1309 AuditableEvent identifiers for all such events.

```

1310 <AuditableEventquery>
1311   <AuditableEventFilter>
1312     timestamp GE "2001-01-01" AND -- code by Clause, Section 8.2.10
1313     registryEntry EQUAL "urn:path:myitem"
1314   </AuditableEventFilter>
1315 </AuditableEventQuery>
  
```

1317

1318 A client company has many registered objects in the Registry. The Registry allows
 1319 events submitted by other organizations to have an impact on your registered items,
 1320 e.g. new classifications and new associations. The following query will return a set of
 1321 identifiers for all auditable events, invoked by some other party, that had an impact on
 1322 an item submitted by "myorg" and for which "myorg" is the responsible organization.

```

1323 <AuditableEventQuery>
1324   <RegistryEntryQuery>
1325
  
```

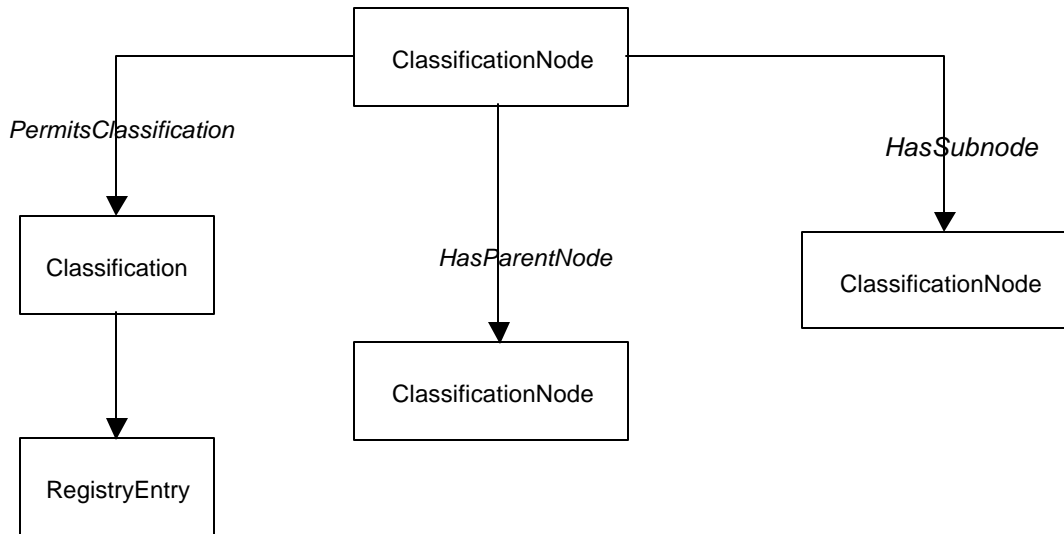
```
1326     <SubmittingOrganizationBranch>
1327         <OrganizationFilter>
1328             id EQUAL "urn:somepath:myorg"           -- code by Clause, Section 8.2.10
1329         </OrganizationFilter>
1330     </SubmittingOrganizationBranch>
1331     <ResponsibleOrganizationBranch>
1332         <OrganizationFilter>
1333             id EQUAL "urn:somepath:myorg"           -- code by Clause, Section 8.2.10
1334         </OrganizationFilter>
1335     </ResponsibleOrganizationBranch>
1336 </RegistryEntryQuery>
1337 <InvokedByBranch>
1338     <OrganizationQuery>
1339         <OrganizationFilter>
1340             id -EQUAL "urn:somepath:myorg"         -- code by Clause, Section 8.2.10
1341         </OrganizationFilter>
1342     </OrganizationQuery>
1343 </InvokedByBranch>
1344 </AuditableEventQuery>
1345
```

1345 **8.2.4 ClassificationNodeQuery**

1346 **Purpose**

1347 To identify a set of classification node instances as the result of a query over selected
 1348 registry metadata.

1349 **ebRIM Binding**



1350 **Definition**

```

1351
1352 <!--ELEMENT ClassificationNodeQuery
1353   ( ClassificationNodeFilter?,
1354     PermitsClassificationBranch*,
1355     HasParentNode?,
1356     HasSubnode*           )>
1357
1358 <!--ELEMENT PermitsClassificationBranch
1359   ( ClassificationFilter?,
1360     RegistryEntryQuery?   )>
1361
1362 <!--ELEMENT HasParentNode
1363   ( ClassificationNodeFilter?,
1364     HasParentNode?       )>
1365
1366 <!--ELEMENT HasSubnode
1367   ( ClassificationNodeFilter?,
1368     HasSubnode*         )>
    
```

1369

1370

1371 **Semantic Rules**

- 1372 1. Let CN denote the set of all persistent ClassificationNode instances in the Registry.
1373 The following steps will eliminate instances in CN that do not satisfy the conditions of
1374 the specified filters.
- 1375 a) If a ClassificationNodeFilter is not specified, or if CN is empty, then continue
1376 below; otherwise, let x be a classification node in CN. If x does not satisfy the
1377 ClassificationNodeFilter as defined in Section 8.2.9, then remove x from AE.
- 1378 b) If a PermitsClassificationBranch element is not specified, or if CN is empty, then
1379 continue below; otherwise, let x be a remaining classification node in CN. If x is
1380 not the target object of some Classification instance, then remove x from CN;
1381 otherwise, treat each PermitsClassificationBranch element separately as follows:
- 1382 If no ClassificationFilter is specified within the PermitsClassificationBranch
1383 element, then let CL be the set of all Classification instances that have x as the
1384 target object; otherwise, let CL be the set of Classification instances that satisfy
1385 the ClassificationFilter and have x as the target object. If CL is empty, then
1386 remove x from CN. If no RegistryEntryQuery is specified within the
1387 PermitsClassificationBranch element, then let RES be the set of all RegistryEntry
1388 instances that are the source object of some classification instance in CL;
1389 otherwise, let RE be the result set of the RegistryEntryQuery as defined in
1390 Section 8.2.2 and let RES be the set of all instances in RE that are the source
1391 object of some classification in CL. If RES is empty, then remove x from CN.
- 1392 c) If a HasParentNode element is not specified, or if CN is empty, then continue
1393 below; otherwise, let x be a remaining classification node in CN and execute the
1394 following paragraph with $n=x$.
- 1395 Let n be a classification node instance. If n does not have a parent node (i.e. if n
1396 is a root node), then remove x from CN. Let p be the parent node of n. If a
1397 ClassificationNodeFilter element is directly contained in HasParentNode and if p
1398 does not satisfy the ClassificationNodeFilter, then remove x from CN.
- 1399 If another HasParentNode element is directly contained within this
1400 HasParentNode element, then repeat the previous paragraph with $n=p$.
- 1401 d) If a HasSubnode element is not specified, or if CN is empty, then continue below;
1402 otherwise, let x be a remaining classification node in CN. If x is not the parent
1403 node of some ClassificationNode instance, then remove x from CN; otherwise,
1404 treat each HasSubnode element separately and execute the following paragraph
1405 with $n = x$.
- 1406 Let n be a classification node instance. If a ClassificationNodeFilter is not
1407 specified within the HasSubnode element then let CNC be the set of all
1408 classification nodes that have n as their parent node; otherwise, let CNC be the
1409 set of all classification nodes that satisfy the ClassificationNodeFilter and have n
1410 as their parent node. If CNC is empty then remove x from CN; otherwise, let y be
1411 an element of CNC and continue with the next paragraph.

- 1412 If the HasSubnode element is terminal, i.e. if it does not directly contain another
1413 HasSubnode element, then continue below; otherwise, repeat the previous
1414 paragraph with the new HasSubnode element and with $n = y$.
- 1415 2. If CN is empty, then raise the warning: *classification node query result is empty*.
- 1416 3. Return CN as the result of the ClassificationNodeQuery.

1417

1418 Examples

1419 A client application wishes to identify all classification nodes defined in the Registry that
1420 are root nodes and have a name that contains the phrase “product code” or the phrase
1421 “product type”. Note: By convention, if a classification node has no parent (i.e. is a root
1422 node), then the parent attribute of that instance is set to null and is represented as a
1423 literal by a zero length string.

1424

```
1425 <ClassificationNodeQuery>
1426   <ClassificationNodeFilter>
1427     (name CONTAINS "product code" OR      -- code by Clause, Section 8.2.10
1428      name CONTAINS "product type") AND
1429     parent EQUAL ""
1430   </ClassificationNodeFilter>
1431 </ClassificationNodeQuery>
```

1432

1433 A client application wishes to identify all of the classification nodes at the third level of a
1434 classification scheme hierarchy. The client knows that the URN identifier for the root
1435 node is “urn:ebxml:cs:myroot”. The following query identifies all nodes at the second
1436 level under “myroot” (i.e. third level overall).

1437

```
1438 <ClassificationNodeQuery>
1439   <HasParentNode>
1440     <HasParentNode>
1441       <ClassificationNodeFilter>
1442         id EQ "urn:ebxml:cs:myroot" -- code by Clause, Section 8.2.10
1443       </ClassificationNodeFilter>
1444     </HasParentNode>
1445   </HasParentNode>
1446 </ClassificationNodeQuery>
```

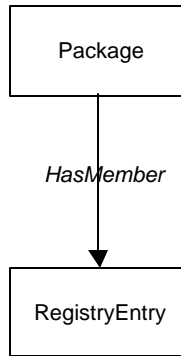
1447

1447 **8.2.5 RegistryPackageQuery**

1448 **Purpose**

1449 To identify a set of registry package instances as the result of a query over selected
 1450 registry metadata.

1451 **ebRIM Binding**



1452 **Definition**

```

    1453
    1454 <!ELEMENT RegistryPackageQuery
    1455 ( PackageFilter?,
    1456 HasMemberBranch* )>
    1457
    1458 <!ELEMENT HasMemberBranch
    1459 ( RegistryEntryQuery? )>
    
```

1460

1461 **Semantic Rules**

1462 1. Let RP denote the set of all persistent Package instances in the Registry. The
 1463 following steps will eliminate instances in RP that do not satisfy the conditions of the
 1464 specified filters.

- 1465 a) If a PackageFilter is not specified, or if RP is empty, then continue below;
 1466 otherwise, let x be a package instance in RP. If x does not satisfy the
 1467 PackageFilter as defined in Section 8.2.9, then remove x from RP.
- 1468 b) If a HasMemberBranch element is not directly contained in the
 1469 RegistryPackageQuery, or if RP is empty, then continue below; otherwise, let x
 1470 be a remaining package instance in RP. If x is an empty package, then remove x
 1471 from RP; otherwise, treat each HasMemberBranch element separately as
 1472 follows:

1473

1474 If a RegistryEntryQuery element is not directly contained in the
1475 HasMemberBranch element, then let PM be the set of all RegistryEntry instances
1476 that are members of the package x; otherwise, let RE be the set of RegistryEntry
1477 instances returned by the RegistryEntryQuery as defined in Section 8.2.2 and let
1478 PM be the subset of RE that are members of the package x. If PM is empty, then
1479 remove x from RP.

1480 2. If RP is empty, then raise the warning: *registry package query result is empty*.

1481 3. Return RP as the result of the RegistryPackageQuery.

1482

1483 Examples

1484 A client application wishes to identify all package instances in the Registry that contain
1485 an Invoice extrinsic object as a member of the package.

1486

```
1487 <RegistryPackageQuery>
1488   <HasMemberBranch>
1489     <RegistryEntryQuery>
1490       <RegistryEntryFilter>
1491         objectType EQ "Invoice"      -- code by Clause, Section 8.2.10
1492       </RegistryEntryFilter>
1493     </RegistryEntryQuery>
1494   </HasMemberBranch>
1495 </RegistryPackageQuery>
1496
```

1497 A client application wishes to identify all package instances in the Registry that are not
1498 empty.

1499

```
1500 <RegistryEntryQuery>
1501   <HasMemberBranch/>
1502 </RegistryEntryQuery>
1503
```

1504 A client application wishes to identify all package instances in the Registry that are
1505 empty. Since the RegistryPackageQuery is not set up to do negations, clients will have
1506 to do two separate RegistryPackageQuery requests, one to find all packages and
1507 another to find all non-empty packages, and then do the set difference themselves.
1508 Alternatively, they could do a more complex RegistryEntryQuery and check that the
1509 packaging association between the package and its members is non-existent.

1510 Note: A registry package is an intrinsic RegistryEntry instance that is completely
1511 determined by its associations with its members. Thus a RegistryPackageQuery can
1512 always be re-specified as an equivalent RegistryEntryQuery using appropriate "Source"
1513 and "Target" associations. However, the equivalent RegistryEntryQuery is often more
1514 complicated to write.

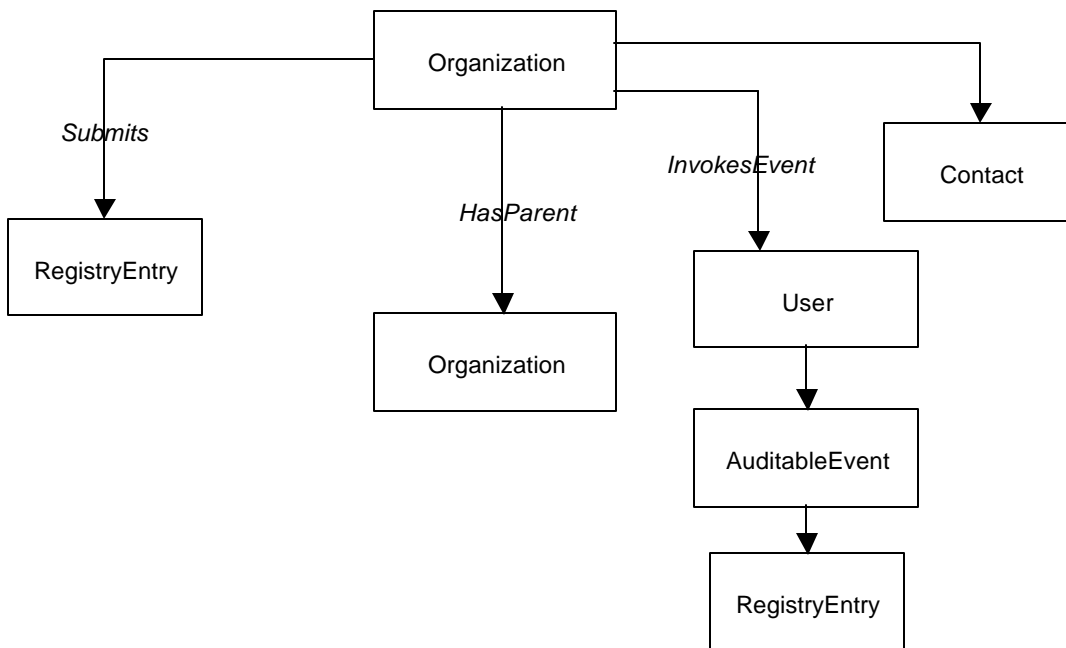
1515

1515 **8.2.6 OrganizationQuery**

1516 **Purpose**

1517 To identify a set of organization instances as the result of a query over selected registry
 1518 metadata.

1519 **ebRIM Binding**



1520

1521 **Definition**

```

1522
1523 <!ELEMENT OrganizationQuery
1524 ( OrganizationFilter?,
1525 SubmitsRegistryEntry*,
1526 HasParentOrganization?,
1527 InvokesEventBranch*,
1528 ContactFilter )>
1529
1530 <!ELEMENT SubmitsRegistryEntry ( RegistryEntryQuery? )>
1531
1532 <!ELEMENT HasParentOrganization
1533 ( OrganizationFilter?,
1534 HasParentOrganization? )>
1535
1536 <!ELEMENT InvokesEventBranch
1537 ( UserFilter?,
1538 AuditableEventFilter?,
1539 RegistryEntryQuery? )>
    
```

1540 **Semantic Rules**

- 1541 1. Let ORG denote the set of all persistent Organization instances in the Registry. The
1542 following steps will eliminate instances in ORG that do not satisfy the conditions of
1543 the specified filters.
- 1544 a) If an OrganizationFilter element is not directly contained in the
1545 OrganizationQuery element, or if ORG is empty, then continue below; otherwise,
1546 let x be an organization instance in ORG. If x does not satisfy the
1547 OrganizationFilter as defined in Section 8.2.9, then remove x from RP.
- 1548 b) If a SubmitsRegistryEntry element is not specified within the OrganizationQuery,
1549 or if ORG is empty, then continue below; otherwise, consider each
1550 SubmitsRegistryEntry element separately as follows:
- 1551 If no RegistryEntryQuery is specified within the SubmitsRegistryEntry element,
1552 then let RES be the set of all RegistryEntry instances that have been submitted
1553 to the Registry by organization x; otherwise, let RE be the result of the
1554 RegistryEntryQuery as defined in Section 8.2.2 and let RES be the set of all
1555 instances in RE that have been submitted to the Registry by organization x. If
1556 RES is empty, then remove x from ORG.
- 1557 c) If a HasParentOrganization element is not specified within the
1558 OrganizationQuery, or if ORG is empty, then continue below; otherwise, execute
1559 the following paragraph with o = x:
- 1560 Let o be an organization instance. If an OrganizationFilter is not specified within
1561 the HasParentOrganization and if o has no parent (i.e. if o is a root organization
1562 in the Organization hierarchy), then remove x from ORG; otherwise, let p be the
1563 parent organization of o. If p does not satisfy the OrganizationFilter, then remove
1564 x from ORG.
- 1565 If another HasParentOrganization element is directly contained within this
1566 HasParentOrganization element, then repeat the previous paragraph with o = p.
- 1567 d) If an InvokesEventBranch element is not specified within the OrganizationQuery,
1568 or if ORG is empty, then continue below; otherwise, consider each
1569 InvokesEventBranch element separately as follows:
- 1570 If an UserFilter is not specified, and if x is not the submitting organization of some
1571 AuditableEvent instance, then remove x from ORG. If an AuditableEventFilter is
1572 not specified, then let AE be the set of all AuditableEvent instances that have x
1573 as the submitting organization; otherwise, let AE be the set of AuditableEvent
1574 instances that satisfy the AuditableEventFilter and have x as the submitting
1575 organization. If AE is empty, then remove x from ORG. If a RegistryEntryQuery is
1576 not specified in the InvokesEventBranch element, then let RES be the set of all
1577 RegistryEntry instances associated with an event in AE; otherwise, let RE be the
1578 result set of the RegistryEntryQuery, as specified in Section 8.2.2, and let RES
1579 be the subset of RE of entries submitted by x. If RES is empty, then remove x
1580 from ORG.

1581 e) If a ContactFilter is not specified within the OrganizationQuery, or if ORG is
1582 empty, then continue below; otherwise, consider each ContactFilter separately as
1583 follows:

1584 Let CT be the set of Contact instances that satisfy the ContactFilter and are the
1585 contacts for organization x. If CT is empty, then remove x from ORG.

1586 2. If ORG is empty, then raise the warning: *organization query result is empty*.

1587 3. Return ORG as the result of the OrganizationQuery.

1588

1589 Examples

1590 A client application wishes to identify a set of organizations, based in France, that have
1591 submitted a PartyProfile extrinsic object this year.

```
1592 <OrganizationQuery>  
1593   <OrganizationFilter>  
1594     country EQUAL "France"           -- code by Clause, Section 8.2.10  
1595   </OrganizationFilter>  
1596   <SubmitsRegistryEntry>  
1597     <RegistryEntryQuery>  
1598       <RegistryEntryFilter>  
1599         objectType EQUAL "CPP"      -- code by Clause, Section 8.2.10  
1600       </RegistryEntryFilter>  
1601       <HasAuditableEventBranch>  
1602         <AuditableEventFilter>  
1603           timestamp GE "2001-01-01" -- code by Clause, Section 8.2.10  
1604         </AuditableEventFilter>  
1605       </HasAuditableEventBranch>  
1606     </RegistryEntryQuery>  
1607   </SubmitsRegistryEntry>  
1608 </OrganizationQuery>
```

1610

1611 A client application wishes to identify all organizations that have XYZ, Corporation as a
1612 parent. The client knows that the URN for XYZ, Corp. is urn:ebxml:org:xyz, but there is
1613 no guarantee that subsidiaries of XYZ have a URN that uses the same format, so a full
1614 query is required.

```
1615 <OrganizationQuery>  
1616   <HasParentOrganization>  
1617     <OrganizationFilter>  
1618       id EQUAL "urn:ebxml:org:xyz"  -- code by Clause, Section 8.2.10  
1619     </OrganizationFilter>  
1620   </HasParentOrganization>  
1621 </OrganizationQuery>
```

1623

1623 8.2.7 ReturnRegistryEntry

1624 Purpose

1625 To construct an XML document that contains selected registry metadata associated with
 1626 the registry entries identified by a RegistryEntryQuery. NOTE: Initially, the
 1627 RegistryEntryQuery could be the URN identifier for a single registry entry.

1628 Definition

```

1629
1630 <!ELEMENT ReturnRegistryEntry
1631   (
1632     RegistryEntryQuery,
1633     WithClassifications?,
1634     WithSourceAssociations?,
1635     WithTargetAssociations?,
1636     WithAuditableEvents?,
1637     WithExternalLinks?
1638   )>
1639
1640 <!ELEMENT WithClassifications ( ClassificationFilter? )>
1641 <!ELEMENT WithSourceAssociations ( AssociationFilter? )>
1642 <!ELEMENT WithTargetAssociations ( AssociationFilter? )>
1643 <!ELEMENT WithAuditableEvents ( AuditableEventFilter? )>
1644 <!ELEMENT WithExternalLinks ( ExternalLinkFilter? )>
1645
1646 <!ELEMENT ReturnRegistryEntryResult
1647   (
1648     RegistryEntryMetadata*
1649   )>
1650
1651 <!ELEMENT RegistryEntryMetadata
1652   (
1653     RegistryEntry,
1654     Classification*,
1655     SourceAssociations?,
1656     TargetAssociations?,
1657     AuditableEvent*,
1658     ExternalLink*
1659   )>
1660
1661 <!ELEMENT SourceAssociations ( Association* )>
1662 <!ELEMENT TargetAssociations ( Association* )>
  
```

1657 Semantic Rules

- 1658 1. The RegistryEntry, Classification, Association, AuditableEvent, and ExternalLink
 1659 elements contained in the ReturnRegistryEntryResult are defined by the ebXML
 1660 Registry DTD specified in Appendix A.
- 1661 2. Execute the RegistryEntryQuery according to the Semantic Rules specified in
 1662 Section 8.2.2, and let R be the result set of identifiers for registry entry instances. Let
 1663 S be the set of warnings and errors returned. If any element in S is an error
 1664 condition, then stop execution and return the same set of warnings and errors along
 1665 with the ReturnRegistryEntryResult.

- 1666 3. If the set R is empty, then do not return a RegistryEntryMetadata subelement in the
1667 ReturnRegistryEntryResult. Instead, raise the warning: *no resulting registry entry*.
1668 Add this warning to the error list returned by the RegistryEntryQuery and return this
1669 enhanced error list with the ReturnRegistryEntryResult.
- 1670 4. For each registry entry E referenced by an element of R, use the attributes of E to
1671 create a new RegistryEntry element as defined in Appendix A. Then create a new
1672 RegistryEntryMetadata element as defined above to be the parent element of that
1673 RegistryEntry element.
- 1674 5. If no With option is specified, then the resulting RegistryEntryMetadata element has
1675 no Classification, SourceAssociations, TargetAssociations, AuditableEvent, or
1676 ExternalData subelements. The set of RegistryEntryMetadata elements, with the
1677 Error list from the RegistryEntryQuery, is returned as the ReturnRegistryEntryResult.
- 1678 6. If WithClassifications is specified, then for each E in R do the following: If a
1679 ClassificationFilter is not present, then let C be any classification instance linked to
1680 E; otherwise, let C be a classification instance linked to E that satisfies the
1681 ClassificationFilter (Section 8.2.9). For each such C, create a new Classification
1682 element as defined in Appendix A. Add these Classification elements to their parent
1683 RegistryEntryMetadata element.
- 1684 7. If WithSourceAssociations is specified, then for each E in R do the following: If an
1685 AssociationFilter is not present, then let A be any association instance whose source
1686 object is E; otherwise, let A be an association instance that satisfies the
1687 AssociationFilter (Section 8.2.9) and whose source object is E. For each such A,
1688 create a new Association element as defined in Appendix A. Add these Association
1689 elements as subelements of the WithSourceAssociations and add that element to its
1690 parent RegistryEntryMetadata element.
- 1691 8. If WithTargetAssociations is specified, then for each E in R do the following: If an
1692 AssociationFilter is not present, then let A be any association instance whose target
1693 object is E; otherwise, let A be an association instance that satisfies the
1694 AssociationFilter (Section 8.2.9) and whose target object is E. For each such A,
1695 create a new Association element as defined in Appendix A. Add these Association
1696 elements as subelements of the WithTargetAssociations and add that element to its
1697 parent RegistryEntryMetadata element.
- 1698 9. If WithAuditableEvents is specified, then for each E in R do the following: If an
1699 AuditableEventFilter is not present, then let A be any auditable event instance linked
1700 to E; otherwise, let A be any auditable event instance linked to E that satisfies the
1701 AuditableEventFilter (Section 8.2.9). For each such A, create a new AuditableEvent
1702 element as defined in Appendix A. Add these AuditableEvent elements to their
1703 parent RegistryEntryMetadata element.

- 1704 10. If WithExternalLinks is specified, then for each E in R do the following: If an
1705 ExternalLinkFilter is not present, then let L be any external link instance linked to E;
1706 otherwise, let L be any external link instance linked to E that satisfies the
1707 ExternalLinkFilter (Section 8.2.9). For each such D, create a new ExternalLink
1708 element as defined in Appendix A. Add these ExternalLink elements to their parent
1709 RegistryEntryMetadata element.
- 1710 11. If any warning or error condition results, then add the code and the message to the
1711 RegistryResponse element that includes the RegistryEntryQueryResult.
- 1712 12. Return the set of RegistryEntryMetadata elements as the content of the
1713 ReturnRegistryEntryResult.

1714

1715 Examples

1716 A customer of XYZ Corporation has been using a PurchaseOrder DTD registered by
1717 XYZ some time ago. Its URN identifier is "urn:com:xyz:po:325". The customer wishes to
1718 check on the current status of that DTD, especially if it has been superseded or
1719 replaced, and get all of its current classifications. The following query request will return
1720 an XML document with the registry entry for the existing DTD as the root, with all of its
1721 classifications, and with associations to registry entries for any items that have
1722 superseded or replaced it.

```
1723
1724 <ReturnRegistryEntry>
1725   <RegistryEntryQuery>
1726     <RegistryEntryFilter>
1727       id EQUAL "urn:com:xyz:po:325"           -- code by Clause, Section 8.2.10
1728     </RegistryEntryFilter>
1729   </RegistryEntryQuery>
1730   <WithClassifications/>
1731   <WithSourceAssociations>
1732     <AssociationFilter>                       -- code by Clause, Section 8.2.10
1733       associationType EQUAL "SupersededBy" OR
1734       associationType EQUAL "ReplacedBy"
1735     </AssociationFilter>
1736   </WithSourceAssociations>
1737 </ReturnRegistryEntry>
```

1738

1739 A client of the Registry registered an XML DTD several years ago and is now thinking of
1740 replacing it with a revised version. The identifier for the existing DTD is
1741 "urn:xyz:dtd:po97". The proposed revision is not completely upward compatible with the
1742 existing DTD. The client desires a list of all registered items that use the existing DTD
1743 so they can assess the impact of an incompatible change. The following query returns
1744 an XML document that is a list of all RegistryEntry elements that represent registered
1745 items that use, contain, or extend the given DTD. The document also links each
1746 RegistryEntry element in the list to an element for the identified association.

1747

```
1748
1749     <ReturnRegistryEntry>
1750         <RegistryEntryQuery>
1751             <SourceAssociationBranch>
1752                 <AssociationFilter>                -- code by Clause, Section 8.2.10
1753                     associationType EQUAL "Contains" OR
1754                     associationType EQUAL "Uses" OR
1755                     associationType EQUAL "Extends"
1756                 </AssociationFilter>
1757                 <RegistryEntryFilter>            -- code by Clause, Section 8.2.10
1758                     id EQUAL "urn:xyz:dtd:po97"
1759                 </RegistryEntryFilter>
1760             </SourceAssociationBranch>
1761         </RegistryEntryQuery>
1762         <WithSourceAssociations>
1763             <AssociationFilter>                -- code by Clause, Section 8.2.10
1764                 associationType EQUAL "Contains" OR
1765                 associationType EQUAL "Uses" OR
1766                 associationType EQUAL "Extends"
1767             </AssociationFilter>
1768         </WithSourceAssociations>
1769     </ReturnRegistryEntry>
```

1770

1771 A user has been browsing the registry and has found a registry entry that describes a
1772 package of core-components that should solve the user's problem. The package URN
1773 identifier is "urn:com:cc:pkg:ccstuff". Now the user wants to know what's in the package.
1774 The following query returns an XML document with a registry entry for each member of
1775 the package along with that member's Uses and HasMemberBranch associations.

```
1776
1777     <ReturnRegistryEntry>
1778         <RegistryEntryQuery>
1779             <TargetAssociationBranch>
1780                 <AssociationFilter>                -- code by Clause, Section 8.2.10
1781                     associationType EQUAL "HasMember"
1782                 </AssociationFilter>
1783                 <RegistryEntryFilter>            -- code by Clause, Section 8.2.10
1784                     id EQUAL " urn:com:cc:pkg:ccstuff "
1785                 </RegistryEntryFilter>
1786             </TargetAssociationBranch>
1787         </RegistryEntryQuery>
1788         <WithSourceAssociations>
1789             <AssociationFilter>                -- code by Clause, Section 8.2.10
1790                 associationType EQUAL "HasMember" OR
1791                 associationType EQUAL "Uses"
1792             </AssociationFilter>
1793         </WithSourceAssociations>
1794     </ReturnRegistryEntry>
```

1795

1795 8.2.8 ReturnRepositoryItem

1796 Purpose

1797 To construct an XML document that contains one or more repository items, and some
 1798 associated metadata, by submitting a RegistryEntryQuery to the registry/repository that
 1799 holds the desired objects. NOTE: Initially, the RegistryEntryQuery could be the URN
 1800 identifier for a single registry entry.

1801 Definition

```

1802
1803 <!ELEMENT ReturnRepositoryItem
1804 ( RegistryEntryQuery,
1805   RecursiveAssociationOption?,
1806   WithDescription? )>
1807
1808 <!ELEMENT RecursiveAssociationOption ( AssociationType+ )>
1809 <!ATTLIST RecursiveAssociationOption
1810   depthLimit CDATA #IMPLIED >
1811
1812 <!ELEMENT AssociationType EMPTY >
1813 <!ATTLIST AssociationType
1814   role CDATA #REQUIRED >
1815
1816 <!ELEMENT WithDescription EMPTY >
1817
1818 <!ELEMENT ReturnRepositoryItemResult
1819 ( RepositoryItem*)>
1820
1821 <!ELEMENT RepositoryItem
1822 ( ClassificationScheme
1823   | RegistryPackage
1824   | ExtrinsicObject
1825   | WithdrawnObject
1826   | ExternalLinkItem )>
1827 <!ATTLIST RepositoryItem
1828   identifier CDATA #REQUIRED
1829   name CDATA #REQUIRED
1830   contentURI CDATA #REQUIRED
1831   objectType CDATA #REQUIRED
1832   status CDATA #REQUIRED
1833   stability CDATA #REQUIRED
1834   description CDATA #IMPLIED >
1835
1836 <!ELEMENT ExtrinsicObject (#PCDATA) >
1837 <!ATTLIST ExtrinsicObject
1838   byteEncoding CDATA "Base64" >
1839
1840 <!ELEMENT WithdrawnObject EMPTY >
1841
1842 <!ELEMENT ExternalLinkItem EMPTY >
1843
1844
```

1845

1846 **Semantic Rules**

- 1847 1. If the RecursiveOption element is not present , then set Limit=0. If the
1848 RecursiveOption element is present, interpret its depthLimit attribute as an integer
1849 literal. If the depthLimit attribute is not present, then set Limit = -1. A Limit of 0
1850 means that no recursion occurs. A Limit of -1 means that recursion occurs
1851 indefinitely. If a depthLimit value is present, but it cannot be interpreted as a positive
1852 integer, then stop execution and raise the exception: *invalid depth limit*; otherwise,
1853 set Limit=N, where N is that positive integer. A Limit of N means that exactly N
1854 recursive steps will be executed unless the process terminates prior to that limit.
- 1855 2. Set Depth=0. Let Result denote the set of RepositoryItem elements to be returned
1856 as part of the ReturnRepositoryItemResult. Initially Result is empty. Semantic rules
1857 4 through 10 determine the content of Result.
- 1858 3. If the WithDescription element is present, then set WSD="yes"; otherwise, set
1859 WSD="no".
- 1860 4. Execute the RegistryEntryQuery according to the Semantic Rules specified in
1861 Section 8.2.2, and let R be the result set of identifiers for registry entry instances. Let
1862 S be the set of warnings and errors returned. If any element in S is an error
1863 condition, then stop execution and return the same set of warnings and errors along
1864 with the ReturnRepositoryItemResult.
- 1865 5. Execute Semantic Rules 6 and 7 with X as a set of registry references derived from
1866 R. After execution of these rules, if Depth is now equal to Limit, then return the
1867 content of Result as the set of RepositoryItem elements in the
1868 ReturnRepositoryItemResult element; otherwise, continue with Semantic Rule 8.
- 1869 6. Let X be a set of RegistryEntry instances. For each registry entry E in X, do the
1870 following:
- 1871 a) If E.contentURI references a repository item in this registry/repository, then
1872 create a new RepositoryItem element, with values for its attributes derived as
1873 specified in Semantic Rule 7.
- 1874 1) If E.objectType="ClassificationScheme", then put the referenced
1875 ClassificationScheme DTD as the subelement of this RepositoryItem.
1876 [NOTE: Requires DTD specification!]
- 1877 2) If E.objectType="RegistryPackage", then put the referenced
1878 RegistryPackage DTD as the subelement of this RepositoryItem. [NOTE:
1879 Requires DTD specification!]
- 1880 3) Otherwise, i.e., if the object referenced by E has an unknown internal
1881 structure, then put the content of the repository item as the #PCDATA of a
1882 new ExtrinsicObject subelement of this RepositoryItem.

- 1883 b) If E.objectURL references a registered object in some other registry/repository,
1884 then create a new RepositoryItem element, with values for its attributes derived
1885 as specified in Semantic Rule 7, and create a new ExternalLink element as the
1886 subelement of this RepositoryItem.
- 1887 c) If E.objectURL is void, i.e. the object it would have referenced has been
1888 withdrawn, then create a new RepositoryItem element, with values for its
1889 attributes derived as specified in Semantic Rule 7, and create a new
1890 WithdrawnObject element as the subelement of this RepositoryItem.
- 1891 7. Let E be a registry entry and let RO be the RepositoryItem element created in
1892 Semantic Rule 6. Set the attributes of RO to the values derived from the
1893 corresponding attributes of E. If WSD="yes", include the value of the description
1894 attribute; otherwise, do not include it. Insert this new RepositoryItem element into the
1895 Result set.
- 1896 8. Let R be defined as in Semantic Rule 3. Execute Semantic Rule 9 with Y as the set
1897 of RegistryEntry instances referenced by R. Then continue with Semantic rule 10.
- 1898 9. Let Y be a set of references to RegistryEntry instances. Let NextLevel be an empty
1899 set of RegistryEntry instances. For each registry entry E in Y, and for each
1900 AssociationType A of the RecursiveAssociationOption, do the following:
- 1901 a) Let Z be the set of target items E' linked to E under association instances having
1902 E as the source object, E' as the target object, and A as the AssociationType.
- 1903 b) Add the elements of Z to NextLevel.
- 1904 10. Let X be the set of new registry entries that are in NextLevel but are not yet
1905 represented in the Result set.
- 1906 Case:
- 1907 a) If X is empty, then return the content of Result as the set of RepositoryItem
1908 elements in the ReturnRepositoryItemResult element.
- 1909 b) If X is not empty, then execute Semantic Rules 6 and 7 with X as the input set.
1910 When finished, add the elements of X to Y and set Depth=Depth+1. If Depth is
1911 now equal to Limit, then return the content of Result as the set of RepositoryItem
1912 elements in the ReturnRepositoryItemResult element; otherwise, repeat
1913 Semantic Rules 9 and 10 with the new set Y of registry entries.
- 1914 11. If any exception, warning, or other status condition results during the execution of
1915 the above, then return appropriate RegistryError elements in the RegistryResult
1916 associated with the ReturnRepositoryItemResult element created in Semantic Rule 5
1917 or Semantic Rule 10.

1918 **Examples**

1919 A registry client has found a registry entry for a core-component item. The item's URN
1920 identity is "urn:ebxml:cc:goodthing". But "goodthing" is a composite item that uses many
1921 other registered items. The client desires the collection of all items needed for a

1922 complete implementation of "goodthing". The following query returns an XML document
1923 that is a collection of all needed items.

```
1924
1925 <ReturnRepositoryItem>
1926   <RegistryEntryQuery>
1927     <RegistryEntryFilter>                                -- code by Clause, Section 8.2.10
1928       id EQUAL "urn:ebxml:cc:goodthing"
1929     </RegistryEntryFilter>
1930   </RegistryEntryQuery>
1931   <RecursiveAssociationOption>
1932     <AssociationType role="Uses" />
1933     <AssociationType role="ValidatesTo" />
1934   </RecursiveAssociationOption>
1935 </ReturnRepositoryItem>
1936
```

1937 A registry client has found a reference to a core-component routine
1938 ("urn:ebxml:cc:rtn:nice87") that implements a given business process. The client knows
1939 that all routines have a required association to its defining UML specification. The
1940 following query returns both the routine and its UML specification as a collection of two
1941 items in a single XML document.

```
1942
1943 <ReturnRepositoryItem>
1944   <RegistryEntryQuery>
1945     <RegistryEntryFilter>                                -- code by Clause, Section 8.2.10
1946       id EQUAL "urn:ebxml:cc:rtn:nice87"
1947     </RegistryEntryFilter>
1948   </RegistryEntryQuery>
1949   <RecursiveAssociationOption depthLimit="1" >
1950     <AssociationType role="ValidatesTo" />
1951   </RecursiveAssociationOption>
1952 </ReturnRepositoryItem>
1953
```

1954 A user has been told that the 1997 version of the North American Industry Classification
1955 System (NAICS) is stored in a registry with URN identifier "urn:nist:cs:naics-1997". The
1956 following query would retrieve the complete classification scheme, with all 1810 nodes,
1957 as an XML document that validates to a classification scheme DTD.

```
1958
1959 <ReturnRepositoryItem>
1960   <RegistryEntryQuery>
1961     <RegistryEntryFilter>                                -- code by Clause, Section 8.2.10
1962       id EQUAL "urn:nist:cs:naics-1997"
1963     </RegistryEntryFilter>
1964   </RegistryEntryQuery>
1965 </ReturnRepositoryItem>
```

1966

1967 Note: The ReturnRepositoryItemResult would include a single RepositoryItem that
1968 consists of a ClassificationScheme document whose content is determined by the URL
1969 <ftp://xsun.sdct.itl.nist.gov/regrep/scheme/naics.txt>.

1970

1970 8.2.9 Registry Filters

1971 Purpose

1972 To identify a subset of the set of all persistent instances of a given registry class.

1973 Definition

1974

1975 <!ELEMENT ObjectFilter (Clause)>

1976

1977 <!ELEMENT RegistryEntryFilter (Clause)>

1978

1979 <!ELEMENT IntrinsicObjectFilter (Clause)>

1980

1981 <!ELEMENT ExtrinsicObjectFilter (Clause)>

1982

1983 <!ELEMENT PackageFilter (Clause)>

1984

1985 <!ELEMENT OrganizationFilter (Clause)>

1986

1987 <!ELEMENT ContactFilter (Clause)>

1988

1989 <!ELEMENT ClassificationNodeFilter (Clause)>

1990

1991 <!ELEMENT AssociationFilter (Clause)>

1992

1993 <!ELEMENT ClassificationFilter (Clause)>

1994

1995 <!ELEMENT ExternalLinkFilter (Clause)>

1996

1997 <!ELEMENT ExternalIdentifierFilter (Clause)>

1998

1999 <!ELEMENT SlotFilter (Clause)>

2000

2001 <!ELEMENT AuditableEventFilter (Clause)>

2002

2003 <!ELEMENT UserFilter (Clause)>

2004

2005 Semantic Rules

- 2006 1. The Clause element is defined in Section 8.2.10, Clause.
- 2007 2. For every ObjectFilter XML element, the leftArgument attribute of any containing
2008 SimpleClause shall identify a public attribute of the RegistryObject UML class
2009 defined in [ebRIM]. If not, raise exception: *object attribute error*. The ObjectFilter
2010 returns a set of identifiers for RegistryObject instances whose attribute values
2011 evaluate to *True* for the Clause predicate.
- 2012 3. For every RegistryEntryFilter XML element, the leftArgument attribute of any
2013 containing SimpleClause shall identify a public attribute of the RegistryEntry UML
2014 class defined in [ebRIM].

- 2015 If not, raise exception: *registry entry attribute error*. The RegistryEntryFilter returns a
2016 set of identifiers for RegistryEntry instances whose attribute values evaluate to *True*
2017 for the Clause predicate.
- 2018 4. For every IntrinsicObjectFilter XML element, the leftArgument attribute of any
2019 containing SimpleClause shall identify a public attribute of the IntrinsicObject UML
2020 class defined in [ebRIM]. If not, raise exception: *intrinsic object attribute error*. The
2021 IntrinsicObjectFilter returns a set of identifiers for IntrinsicObject instances whose
2022 attribute values evaluate to *True* for the Clause predicate.
- 2023 5. For every ExtrinsicObjectFilter XML element, the leftArgument attribute of any
2024 containing SimpleClause shall identify a public attribute of the ExtrinsicObject UML
2025 class defined in [ebRIM]. If not, raise exception: *extrinsic object attribute error*. The
2026 ExtrinsicObjectFilter returns a set of identifiers for ExtrinsicObject instances whose
2027 attribute values evaluate to *True* for the Clause predicate.
- 2028 6. For every PackageFilter XML element, the leftArgument attribute of any containing
2029 SimpleClause shall identify a public attribute of the Package UML class defined in
2030 [ebRIM]. If not, raise exception: *package attribute error*. The PackageFilter returns a
2031 set of identifiers for Package instances whose attribute values evaluate to *True* for
2032 the Clause predicate.
- 2033 7. For every OrganizationFilter XML element, the leftArgument attribute of any
2034 containing SimpleClause shall identify a public attribute of the Organization or
2035 PostalAddress UML classes defined in [ebRIM]. If not, raise exception: *organization*
2036 *attribute error*. The OrganizationFilter returns a set of identifiers for Organization
2037 instances whose attribute values evaluate to *True* for the Clause predicate.
- 2038 8. For every ContactFilter XML element, the leftArgument attribute of any containing
2039 SimpleClause shall identify a public attribute of the Contact or PostalAddress UML
2040 class defined in [ebRIM]. If not, raise exception: *contact attribute error*. The
2041 ContactFilter returns a set of identifiers for Contact instances whose attribute values
2042 evaluate to *True* for the Clause predicate.
- 2043 9. For every ClassificationNodeFilter XML element, the leftArgument attribute of any
2044 containing SimpleClause shall identify a public attribute of the ClassificationNode
2045 UML class defined in [ebRIM]. If not, raise exception: *classification node attribute*
2046 *error*. The ClassificationNodeFilter returns a set of identifiers for ClassificationNode
2047 instances whose attribute values evaluate to *True* for the Clause predicate.
- 2048 10. For every AssociationFilter XML element, the leftArgument attribute of any
2049 containing SimpleClause shall identify a public attribute of the Association UML
2050 class defined in [ebRIM]. If not, raise exception: *association attribute error*. The
2051 AssociationFilter returns a set of identifiers for Association instances whose attribute
2052 values evaluate to *True* for the Clause predicate.

- 2053 11. For every ClassificationFilter XML element, the leftArgument attribute of any
2054 containing SimpleClause shall identify a public attribute of the Classification UML
2055 class defined in [ebRIM]. If not, raise exception: *classification attribute error*. The
2056 ClassificationFilter returns a set of identifiers for Classification instances whose
2057 attribute values evaluate to *True* for the Clause predicate.
- 2058 12. For every ExternalLinkFilter XML element, the leftArgument attribute of any
2059 containing SimpleClause shall identify a public attribute of the ExternalLink UML
2060 class defined in [ebRIM]. If not, raise exception: *external link attribute error*. The
2061 ExternalLinkFilter returns a set of identifiers for ExternalLink instances whose
2062 attribute values evaluate to *True* for the Clause predicate.
- 2063 13. For every ExternalIdentifierFilter XML element, the leftArgument attribute of any
2064 containing SimpleClause shall identify a public attribute of the ExternalIdentifier UML
2065 class defined in [ebRIM]. If not, raise exception: *external identifier attribute error*. The
2066 ExternalIdentifierFilter returns a set of identifiers for ExternalIdentifier instances
2067 whose attribute values evaluate to *True* for the Clause predicate.
- 2068 14. For every SlotFilter XML element, the leftArgument attribute of any containing
2069 SimpleClause shall identify a public attribute of the Slot UML class defined in
2070 [ebRIM]. If not, raise exception: *slot attribute error*. The SlotFilter returns a set of
2071 identifiers for Slot instances whose attribute values evaluate to *True* for the Clause
2072 predicate.
- 2073 15. For every AuditableEventFilter XML element, the leftArgument attribute of a ny
2074 containing SimpleClause shall identify a public attribute of the AuditableEvent UML
2075 class defined in [ebRIM]. If not, raise exception: *auditable event attribute error*. The
2076 AuditableEventFilter returns a set of identifiers for AuditableEvent instances whose
2077 attribute values evaluate to *True* for the Clause predicate.
- 2078 16. For every UserFilter XML element, the leftArgument attribute of any containing
2079 SimpleClause shall identify a public attribute of the User UML class defined in
2080 [ebRIM]. If not, raise exception: *auditable identity attribute error*. The UserFilter
2081 returns a set of identifiers for User instances whose attribute values evaluate to *True*
2082 for the Clause predicate.

2083

2084 **Example**

2085 The following is a complete example of RegistryEntryQuery combined with Clause
2086 expansion of RegistryEntryFilter to return a set of RegistryEntry instances whose
2087 objectType attribute is "CPP" and whose status attribute is "Approved".

```
2088 <RegistryEntryQuery>
2089   <RegistryEntryFilter>
2090     <Clause>
2091       <CompoundClause   connectivePredicate="And" >
2092         <Clause>
2093           <SimpleClause leftArgument="objectType" >
2094             <StringClause stringPredicate="equal" >CPP</StringClause>
```

```
2096         </SimpleClause>
2097     </Clause>
2098 <Clause>
2099     <SimpleClause leftArgument="status" >
2100 <StringClause stringPredicate="equal" >Approved</StringClause>
2101     </SimpleClause>
2102 </Clause>
2103 </CompoundClause>
2104 </Clause>
2105 </RegistryEntryFilter>
2106 </RegistryEntryQuery>
2107
2108
```

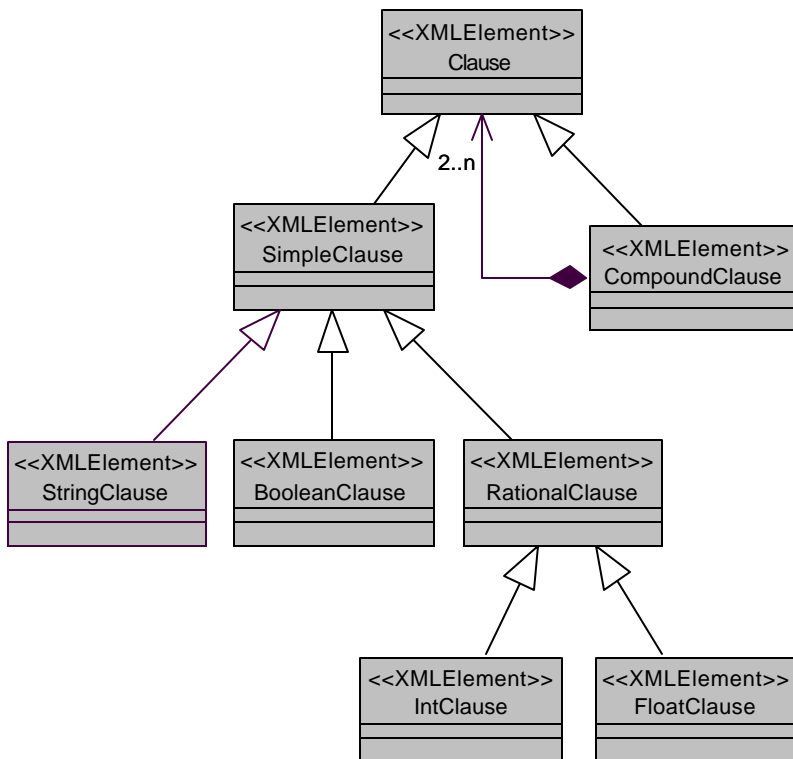

2108 **8.2.10 XML Clause Constraint Representation**

2109 **Purpose**

2110 The simple XML FilterQuery utilizes a formal XML structure based on *Predicate*
 2111 *Clauses*. Predicate Clauses are utilized to formally define the constraint mechanism,
 2112 and are referred to simply as **Clauses** in this specification.

2113 **Conceptual UML Diagram**

2114 The following is a conceptual diagram outlining the Clause base structure. It is
 2115 expressed in UML for visual depiction.



2116
 2117 **Figure 20: The Clause base structure**

2118 **Semantic Rules**

2119 *Predicates* and *Arguments* are combined into a "LeftArgument - Predicate -
 2120 RightArgument" format to form a *Clause*. There are two types of Clauses:
 2121 *SimpleClauses* and *CompoundClauses*.

2122 SimpleClauses

2123 A SimpleClause always defines the leftArgument as a text string, sometimes referred to
 2124 as the *Subject* of the Clause. SimpleClause itself is incomplete (abstract) and must be
 2125 extended. SimpleClause is extended to support BooleanClause, StringClause, and
 2126 RationalClause (abstract).

2127 BooleanClause implicitly defines the predicate as 'equal to', with the right argument as a
 2128 boolean. StringClause defines the predicate as an enumerated attribute of appropriate
 2129 string-compare operations and a right argument as the element's text data. Rational
 2130 number support is provided through a common RationalClause providing an
 2131 enumeration of appropriate rational number compare operations, which is further
 2132 extended to IntClause and FloatClause, each with appropriate signatures for the right
 2133 argument.

2134 CompoundClauses

2135 A CompoundClause contains two or more Clauses (Simple or Compound) and a
 2136 connective predicate. This provides for arbitrarily complex Clauses to be formed.

2137

2138 Definition

2139

```
2140 <!ELEMENT Clause ( SimpleClause | CompoundClause )>
```

2141

```
2142 <!ELEMENT SimpleClause
```

```
2143   ( BooleanClause | RationalClause | StringClause )>
```

```
2144 <!ATTLIST SimpleClause
```

```
2145   leftArgument CDATA #REQUIRED >
```

2146

```
2147 <!ELEMENT CompoundClause ( Clause, Clause+ )>
```

```
2148 <!ATTLIST CompoundClause
```

```
2149   connectivePredicate ( And | Or ) #REQUIRED>
```

2150

```
2151 <!ELEMENT BooleanClause EMPTY >
```

```
2152 <!ATTLIST BooleanClause
```

```
2153   booleanPredicate ( True | False ) #REQUIRED>
```

2154

```
2155 <!ELEMENT RationalClause ( IntClause | FloatClause )>
```

```
2156 <!ATTLIST RationalClause
```

```
2157   logicalPredicate ( LE | LT | GE | GT | EQ | NE ) #REQUIRED >
```

2158

```
2159 <!ELEMENT IntClause ( #PCDATA )
```

```
2160 <!ATTLIST IntClause
```

```
2161   e-dtype NMTOKEN #FIXED 'int' >
```

2162

```
2163 <!ELEMENT FloatClause ( #PCDATA )>
```

```
2164 <!ATTLIST FloatClause
```

```
2165   e-dtype NMTOKEN #FIXED 'float' >
```

2166

```
2167 <!ELEMENT StringClause ( #PCDATA )>
```

```
2168 <!ATTLIST StringClause
```

```
2169   stringPredicate
```

```
2170   ( contains | -contains |
```

```
2171   startswith | -startswith |
```

2172 equal | -equal
2173 endswith | -endswith) #REQUIRED >

2174

2175 **Examples**

2176 **Simple BooleanClause: "Smoker" = True**

2177
2178 <?xml version="1.0" encoding="UTF-8"?>
2179 <!DOCTYPE Clause SYSTEM "Clause.dtd" >
2180 <Clause>
2181 <SimpleClause leftArgument="Smoker">
2182 <BooleanClause booleanPredicate="True"/>
2183 </SimpleClause>
2184 </Clause>
2185

2186 **Simple StringClause: "Smoker" contains "mo"**

2187
2188 <?xml version="1.0" encoding="UTF-8"?>
2189 <!DOCTYPE Clause SYSTEM "Clause.dtd" >
2190 <Clause>
2191 <SimpleClause leftArgument="Smoker">
2192 <StringClause stringcomparepredicate="contains">
2193 mo
2194 </StringClause>
2195 </SimpleClause>
2196 </Clause>

2197

2198 **Simple IntClause: "Age" >= 7**

2199
2200 <?xml version="1.0" encoding="UTF-8"?>
2201 <!DOCTYPE Clause SYSTEM "Clause.dtd" >
2202 <Clause>
2203 <SimpleClause leftArgument="Age">
2204 <RationalClause logicalPredicate="GE">
2205 <IntClause e-dtype="int">7</IntClause>
2206 </RationalClause>
2207 </SimpleClause>
2208 </Clause>
2209

2210 **Simple FloatClause: "Size" = 4.3**

2211
2212 <?xml version="1.0" encoding="UTF-8"?>
2213 <!DOCTYPE Clause SYSTEM "Clause.dtd" >
2214 <Clause>
2215 <SimpleClause leftArgument="Size">
2216 <RationalClause logicalPredicate="E">
2217 <FloatClause e-dtype="float">4.3</FloatClause>
2218 </RationalClause>

2219 </SimpleClause>

2220 </Clause>

2221

2222 Compound with two Simples (("Smoker" = False)AND("Age" =< 45))

2223

2224 <?xml version="1.0" encoding="UTF-8"?>

2225 <!DOCTYPE Clause SYSTEM "Clause.dtd" >

2226 <Clause>

2227 <CompoundClause connectivePredicate="And">

2228 <Clause>

2229 <SimpleClause leftArgument="Smoker">

2230 <BooleanClause booleanPredicate="False"/>

2231 </SimpleClause>

2232 </Clause>

2233 <Clause>

2234 <SimpleClause leftArgument="Age">

2235 <RationalClause logicalPredicate="EL">

2236 <IntClause e-dtype="int">45</IntClause>

2237 </RationalClause>

2238 </SimpleClause>

2239 </Clause>

2240 </CompoundClause>

2241 </Clause>

2242

2243 Coumpound with one Simple and one Compound

2244 (("Smoker" = False)And(("Age" =< 45)Or("American"=True)))

2245

2246 <?xml version="1.0" encoding="UTF-8"?>

2247 <!DOCTYPE Clause SYSTEM "Clause.dtd" >

2248 <Clause>

2249 <CompoundClause connectivePredicate="And">

2250 <Clause>

2251 <SimpleClause leftArgument="Smoker">

2252 <BooleanClause booleanPredicate="False"/>

2253 </SimpleClause>

2254 </Clause>

2255 <Clause>

2256 <CompoundClause connectivePredicate="Or">

2257 <Clause>

2258 <SimpleClause leftArgument="Age">

2259 <RationalClause logicalPredicate="EL">

2260 <IntClause e-dtype="int">45</IntClause>

2261 </RationalClause>

2262 </SimpleClause>

2263 </Clause>

2264 <Clause>

2265 <SimpleClause leftArgument="American">

2266 <BooleanClause booleanPredicate="True"/>

2267 </SimpleClause>

2268 </Clause>

```
2269         </CompoundClause>
2270     </Clause>
2271 </CompoundClause>
2272 </Clause>
```

2273 8.3 SQL Query Support

2274 The Registry may optionally support an SQL based query capability that is designed for
2275 Registry clients that demand more complex query capability. The optional SQLQuery
2276 element in the AdhocQueryRequest allows a client to submit complex SQL queries
2277 using a declarative query language.

2278 The syntax for the SQLQuery of the Registry is defined by a stylized use of a proper
2279 subset of the “SELECT” statement of Entry level SQL defined by ISO/IEC 9075:1992,
2280 Database Language SQL [SQL], extended to include `<sql invoked routines>`
2281 (also known as stored procedures) as specified in ISO/IEC 9075-4 [SQL-PSM] and pre-
2282 defined routines defined in template form in Appendix C.3. The exact syntax of the
2283 Registry query language is defined by the BNF grammar in C.1.

2284 Note that the use of a subset of SQL syntax for SQLQuery does not imply a requirement
2285 to use relational databases in a Registry implementation.

2286 8.3.1 SQL Query Syntax Binding To [ebRIM]

2287 SQL Queries are defined based upon the query syntax in in Appendix C.1 and a fixed
2288 relational schema defined in Appendix C.3. The relational schema is an algorithmic
2289 binding to [ebRIM] as described in the following sections.

2290 8.3.1.1 Interface and Class Binding

2291 A subset of the Interface and class names defined in [ebRIM] map to table names that
2292 may be queried by an SQL query. Appendix C.3 defines the names of the ebRIM
2293 interfaces and classes that may be queried by an SQL query.

2294 The algorithm used to define the binding of [ebRIM] classes to table definitions in
2295 Appendix C.3 is as follows:

- 2296 • Only those classes and interfaces that have concrete instances are mapped to
2297 relational tables. This results in intermediate interfaces in the inheritance
2298 hierarchy, such as RegistryObject and IntrinsicObject, to not map to SQL tables.
2299 An exception to this rule is RegistryEntry, which is defined next.
- 2300 • A special view called RegistryEntry is defined to allow SQL queries to be made
2301 against RegistryEntry instances. This is the only interface defined in [ebRIM] that
2302 does not have concrete instances but is queryable by SQL queries.
- 2303 • The names of relational tables are the same as the corresponding [ebRIM] class
2304 or interface name. However, the name binding is case insensitive.

2305 • Each [ebRIM] class or interface that maps to a table in Appendix C.3 includes
2306 column definitions in Appendix C.3 where the column definitions are based on a
2307 subset of attributes defined for that class or interface in [ebRIM]. The attributes
2308 that map to columns include the inherited attributes for the [ebRIM] class or
2309 interface. Comments in Appendix C.3 indicate which ancestor class or interface
2310 contributed which column definitions.

2311 An SQLException against a table not defined in Appendix C.3 may raise an error condition:
2312 InvalidQueryException.

2313 The following sections describe the algorithm for mapping attributes of [ebRIM] to
2314 SQLcolumn definitions.

2315 **8.3.1.2 Accessor Method To Attribute Binding**

2316 Most of the [ebRIM] interfaces methods are simple get methods that map directly to
2317 attributes. For example the getName method on RegistryObject maps to a name
2318 attribute of type String. Each get method in [ebRIM] defines the exact attribute name
2319 that it maps to in the interface definitions in [ebRIM].

2320 **8.3.1.3 Primitive Attributes Binding**

2321 Attributes defined by [ebRIM] that are of primitive types (e.g. String) may be used in the
2322 same way as column names in SQL. Again the exact attribute names are defined in the
2323 interface definitions in [ebRIM]. Note that while names are in mixed case, SQL-92 is
2324 case insensitive. It is therefore valid for a query to contain attribute names that do not
2325 exactly match the case defined in [ebRIM].

2326 **8.3.1.4 Reference Attribute Binding**

2327 A few of the [ebRIM] interface methods return references to instances of interfaces or
2328 classes defined by [ebRIM]. For example, the getAccessControlPolicy method of the
2329 RegistryObject class returns a reference to an instance of an AccessControlPolicy
2330 object.

2331 In such cases the reference maps to the `id` attribute for the referenced object. The
2332 name of the resulting column is the same as the attribute name in [ebRIM] as defined by
2333 8.3.1.3. The data type for the column is UUID as defined in Appendix C.3.

2334 When a reference attribute value holds a null reference, it maps to a null value in the
2335 SQL binding and may be tested with the `<null specification>` as defined by [SQL].

2336 Reference attribute binding is a special case of a primitive attribute mapping.

2337 **8.3.1.5 Complex Attribute Binding**

2338 A few of the [ebRIM] interfaces define attributes that are not primitive types. Instead
2339 they are of a complex type as defined by an entity class in [ebRIM]. Examples include
2340 attributes of type TelephoneNumber, Contact, PersonName etc. in interface
2341 Organization and class Contact.

2342 The SQL query schema algorithmically maps such complex attributes as multiple
2343 primitive attributes within the parent table. The mapping simply flattens out the entity
2344 class attributes within the parent table. The attribute name for the flattened attributes
2345 are composed of a concatenation of attribute names in the reference chain. For example
2346 Organization has a contact attribute of type Contact. Contact has an address attribute of
2347 type PostalAddress. PostalAddress has a String attribute named city. This city attribute
2348 will be named contact_address_city.

2349 **8.3.1.6 Collection Attribute Binding**

2350 A few of the [ebRIM] interface methods return a collection of references to instances of
2351 interfaces or classes defined by [ebRIM]. For example, the getPackages method of the
2352 ManagedObject class returns a Collection of references to instances of Packages that
2353 the object is a member of.

2354 Such collection attributes in [ebRIM] classes have been mapped to stored procedures in
2355 Appendix C.3 such that these stored procedures return a collection of `id` attribute
2356 values. The returned value of these stored procedures can be treated as the result of a
2357 table sub-query in SQL.

2358 These stored procedures may be used as the right-hand-side of an SQL IN clause to
2359 test for membership of an object in such collections of references.

2360 **8.3.2 Semantic Constraints On Query Syntax**

2361 This section defines simplifying constraints on the query syntax that cannot be
2362 expressed in the BNF for the query syntax. These constraints must be applied in the
2363 semantic analysis of the query.

- 2364 1. Class names and attribute names must be processed in a case insensitive manner.
- 2365 2. The syntax used for stored procedure invocation must be consistent with the syntax
2366 of an SQL procedure invocation as specified by ISO/IEC 9075-4 [SQL/PSM].
- 2367 3. For this version of the specification, the SQL select column list consists of exactly
2368 one column, and must always be `t.id`, where `t` is a table reference in the FROM
2369 clause.

2370 **8.3.3 SQL Query Results**

2371 The results of an SQL query is always an ObjectRefList as defined by the
2372 AdHocQueryResponse in 8.4. This means the result of an SQL query is always a
2373 collection of references to instances of a sub-class of the RegistryObject interface in
2374 [ebRIM]. This is reflected in a semantic constraint that requires that the SQL select
2375 column specified must always be an `id` column in a table in Appendix C.3 for this
2376 version of the specification.

2377 **8.3.4 Simple Metadata Based Queries**

2378 The simplest form of an SQL query is based upon metadata attributes specified for a
2379 single class within [ebRIM]. This section gives some examples of simple metadata
2380 based queries.

2381 For example, to get the collection of ExtrinsicObjects whose name contains the word
2382 'Acme' and that have a version greater than 1.3, the following query predicates must be
2383 supported:

```
2384  
2385 SELECT id FROM ExtrinsicObject WHERE name LIKE '%Acme%' AND  
2386         majorVersion >= 1 AND  
2387         (majorVersion >= 2 OR minorVersion > 3);
```

2388 Note that the query syntax allows for conjugation of simpler predicates into more
2389 complex queries as shown in the simple example above.

2390 **8.3.5 RegistryEntry Queries**

2391 Given the central role played by the RegistryEntry interface in ebRIM, the schema for
2392 the SQL query defines a special view called RegistryEntry that allows doing a
2393 polymorphic query against all RegistryEntry instances regardless of their actual
2394 concrete type or table name.

2395 The following example is the same as Section 8.3.4 except that it is applied against all
2396 RegistryEntry instances rather than just ExtrinsicObject instances. The result set will
2397 include id for all qualifying RegistryEntry instances whose name contains the word
2398 'Acme' and that have a version greater than 1.3.

```
2399 SELECT id FROM RegistryEntry WHERE name LIKE '%Acme%' AND  
2400         objectType = 'ExtrinsicObject' AND  
2401         majorVersion >= 1 AND  
2402         (majorVersion >= 2 OR minorVersion > 3);
```

2403 **8.3.6 Classification Queries**

2404 This section describes the various classification related queries that must be supported.

2405 **8.3.6.1 Identifying ClassificationNodes**

2406 Like all objects in [ebRIM], ClassificationNodes are identified by their ID. However, they
2407 may also be identified as a path attribute that specifies an XPATH expression [XPT]
2408 from a root classification node to the specified classification node in the XML document
2409 that would represent the ClassificationNode tree including the said ClassificationNode.

2410 **8.3.6.2 Getting Root Classification Nodes**

2411 To get the collection of root ClassificationNodes the following query predicate must be
2412 supported:

```
2413 SELECT cn.id FROM ClassificationNode cn WHERE parent IS NULL;
```


2414 The above query returns all ClassificationNodes that have their parent attribute set to
 2415 null. Note that the above query may also specify a predicate on the name if a specific
 2416 root ClassificationNode is desired.

2417 **8.3.6.3 Getting Children of Specified ClassificationNode**

2418 To get the children of a ClassificationNode given the ID of that node the following style
 2419 of query must be supported:

```
2420 SELECT cn.id FROM ClassificationNode cn WHERE parent = <id>
```

2421 The above query returns all ClassificationNodes that have the node specified by <id> as
 2422 their parent attribute.

2423 **8.3.6.4 Getting Objects Classified By a ClassificationNode**

2424 To get the collection of ExtrinsicObjects classified by specified ClassificationNodes the
 2425 following style of query must be supported:

```
2426 SELECT id FROM ExtrinsicObject
2427 WHERE
2428     id IN (SELECT classifiedObject FROM Classification
2429           WHERE
2430             classificationNode IN (SELECT id FROM ClassificationNode
2431                                   WHERE path = '/Geography/Asia/Japan'))
2432 AND
2433     id IN (SELECT classifiedObject FROM Classification
2434           WHERE
2435             classificationNode IN (SELECT id FROM ClassificationNode
2436                                   WHERE path = '/Industry/Automotive'))
2437
```

2438 The above query gets the collection of ExtrinsicObjects that are classified by the
 2439 Automotive Industry and the Japan Geography. Note that according to the semantics
 2440 defined for GetClassifiedObjectsRequest, the query will also contain any objects that
 2441 are classified by descendents of the specified ClassificationNodes.

2442 **8.3.6.5 Getting ClassificationNodes That Classify an Object**

2443 To get the collection of ClassificationNodes that classify a specified Object the following
 2444 style of query must be supported:

```
2445 SELECT id FROM ClassificationNode
2446 WHERE id IN (RegistryEntry_classificationNodes(<id>))
```

2447 **8.3.7 Association Queries**

2448 This section describes the various Association related queries that must be supported.

2449 **8.3.7.1 Getting All Association With Specified Object As Its Source**

2450 To get the collection of Associations that have the specified Object as its source, the
 2451 following query must be supported:

```
2452 SELECT id FROM Association WHERE sourceObject = <id>
```

2453 **8.3.7.2 Getting All Association With Specified Object As Its Target**

2454 To get the collection of Associations that have the specified Object as its target, the
2455 following query must be supported:

```
2456 SELECT id FROM Association WHERE targetObject = <id>
```

2457 **8.3.7.3 Getting Associated Objects Based On Association Attributes**

2458 To get the collection of Associations that have specified Association attributes, the
2459 following queries must be supported:

2460 Select Associations that have the specified name.

```
2461 SELECT id FROM Association WHERE name = <name>
```

2462 Select Associations that have the specified source role name.

```
2463 SELECT id FROM Association WHERE sourceRole = <roleName>
```

2464 Select Associations that have the specified target role name.

```
2465 SELECT id FROM Association WHERE targetRole = <roleName>
```

2466 Select Associations that have the specified association type, where association type is a
2467 string containing the corresponding field name described in [ebRIM].

```
2468 SELECT id FROM Association WHERE  
2469     associationType = <associationType>
```

2470 **8.3.7.4 Complex Association Queries**

2471 The various forms of Association queries may be combined into complex predicates.
2472 The following query selects Associations from an object with a specified id, that have
2473 the sourceRole "buysFrom" and targetRole "sellsTo":

```
2474 SELECT id FROM Association WHERE  
2475     sourceObject = <id> AND  
2476     sourceRole = 'buysFrom' AND  
2477     targetRole = 'sellsTo'
```

2478 **8.3.8 Package Queries**

2479 To find all Packages that a specified ExtrinsicObject belongs to, the following query is
2480 specified:

```
2481 SELECT id FROM Package WHERE id IN (RegistryEntry_packages(<id>))
```

2482 **8.3.8.1 Complex Package Queries**

2483 The following query gets all Packages that a specified object belongs to, that are not
2484 deprecated and where name contains "RosettaNet."

```
2485 SELECT id FROM Package WHERE  
2486     id IN (RegistryEntry_packages(<id>)) AND  
2487     name LIKE '%RosettaNet%' AND  
2488     status <> 'Deprecated'
```

2489 **8.3.9 ExternalLink Queries**

2490 To find all ExternalLinks that a specified ExtrinsicObject is linked to, the following query
2491 is specified:

```
2492 SELECT id From ExternalLink WHERE id IN (RegistryEntry_externalLinks(<id>))
```

2493 To find all ExtrinsicObjects that are linked by a specified ExternalLink, the following
 2494 query is specified:

```
2495 SELECT id From ExtrinsicObject WHERE id IN (RegistryEntry_linkedObjects(<id>))
```

2496 **8.3.9.1 Complex ExternalLink Queries**

2497 The following query gets all ExternalLinks that a specified ExtrinsicObject belongs to,
 2498 that contain the word 'legal' in their description and have a URL for their externalURI.

```
2499 SELECT id FROM ExternalLink WHERE  

    2500 id IN (RegistryEntry_externalLinks(<id>)) AND  

    2501 description LIKE '%legal%' AND  

    2502 externalURI LIKE '%http://%'
```

2503 **8.3.10 Audit Trail Queries**

2504 To get the complete collection of AuditableEvent objects for a specified ManagedObject,
 2505 the following query is specified:

```
2506 SELECT id FROM AuditableEvent WHERE registryEntry = <id>
```

2507 **8.4 Ad Hoc Query Request/Response**

2508 A client submits an ad hoc query to the ObjectQueryManager by sending an
 2509 AdhocQueryRequest. The AdhocQueryRequest contains a sub-element that defines a
 2510 query in one of the supported Registry query mechanisms.

2511 The ObjectQueryManager sends an AdhocQueryResponse either synchronously or
 2512 asynchronously back to the client. The AdhocQueryResponse returns a collection of
 2513 objects whose element type is in the set of element types represented by the leaf nodes
 2514 of the RegistryEntry hierarchy in [ebRIM].

2515



2516

2517

Figure 21: Submit Ad Hoc Query Sequence Diagram

2518 For details on the schema for the business documents shown in this process refer to
2519 Appendix A.

2520 8.5 Content Retrieval

2521 A client retrieves content via the Registry by sending the GetContentRequest to the
2522 ObjectQueryManager. The GetContentRequest specifies a list of Object references for
2523 Objects that need to be retrieved. The ObjectQueryManager returns the specified
2524 content by sending a GetContentResponse message to the ObjectQueryManagerClient
2525 interface of the client. If there are no errors encountered, the GetContentResponse
2526 message includes the specified content as additional payloads within the message. In
2527 addition to the GetContentResponse payload, there is one additional payload for each
2528 content that was requested. If there are errors encountered, the RegistryResponse
2529 payload includes an error and there are no additional content specific payloads.

2530 8.5.1 Identification Of Content Payloads

2531 Since the GetContentResponse message may include several repository items as
2532 additional payloads, it is necessary to have a way to identify each payload in the
2533 message. To facilitate this identification, the Registry must do the following:

- 2534 • Use the ID for each RegistryEntry instance that describes the repository item as
2535 the DocumentLabel element in the DocumentReference for that object in the
2536 Manifest element of the ebXMLHeader.

2537 8.5.2 GetContentResponse Message Structure

2538 The following message fragment illustrates the structure of the GetContentResponse
2539 Message that is returning a Collection of CPPs as a result of a GetContentRequest that
2540 specified the IDs for the requested objects. Note that the ID for each object retrieved in
2541 the message as additional payloads is used as its DocumentLabel in the Manifest of the
2542 ebXMLHeader.

```
2543 ...
2544 ...
2545 --PartBoundary
2546 ...
2547 <eb:MessageHeader SOAP-ENV:mustUnderstand="1" eb:version="1.0">
2548 ...
2549 <eb:Service eb:type="ebXMLRegistry">ObjectManager</eb:Service>
2550 <eb:Action>submitObjects</eb:Action>
2551 ...
2552 </eb:MessageHeader>
2553 ...
2554 <eb:Manifest SOAP-ENV:mustUnderstand="1" eb:version="1.0">
2555 <eb:Reference xlink:href="cid:registryentries@example.com" ...>
2556 <eb:Description xml:lang="en-us">XML instances that are parameters for the particular
2557 Registry Interface / Method. These are RIM structures that don't include repository items, just a
2558 reference - contentURI to them.</eb:Description>
2559 </eb:Reference>
2560 <eb:Reference xlink:href="cid:cpp1@example.com" ...>
```

```
2563   <eb:Description xml:lang="en-us">XML instance of CPP 1. This is a repository
2564 item.</eb:Description>
2565   </eb:Reference>
2566   <eb:Reference xlink:href="cid:cpp2@example.com" ...>
2567     <eb:Description xml:lang="en-us">XML instance of CPP 2. This is a repository
2568 item.</eb:Description>
2569     </eb:Reference>
2570   </eb:Manifest>
2571
2572   --PartBoundary
2573   Content-ID: registryentries@example.com
2574   Content-Type: text/xml
2575   ...
2576   <?xml version="1.0" encoding="UTF-8"?>
2577   <RootElement>
2578     <SubmitObjectsRequest>
2579       <RegistryEntryList>
2580         <ExtrinsicObject ... contentURI="cid:cppl@example.com" .../>
2581         <ExtrinsicObject ... contentURI="cid:cpp2@example.com" .../>
2582       </RegistryEntryList>
2583     </SubmitObjectsRequest>
2584   </RootElement>
2585   --PartBoundary
2586   Content-ID: cppl@example.com
2587   Content-Type: text/xml
2588   ...
2589   <CPP>
2590   ...
2591   </CPP>
2592
2593   --PartBoundary
2594   Content-ID: cpp2@example.com
2595   Content-Type: text/xml
2596   ...
2597   <CPP>
2598   ...
2599   </CPP>
2600
2601   --PartBoundary--
2602
```

2603

2604 8.6 Query And Retrieval: Typical Sequence

2605 The following diagram illustrates the use of both browse/drilldown and ad hoc queries
2606 followed by a retrieval of content that was selected by the queries.



2607
2608

Figure 23: Typical Query and Retrieval Sequence

2609 **9 Registry Security**

2610 This chapter describes the security features of the ebXML Registry. It is assumed that
 2611 the reader is familiar with the security related classes in the Registry information model
 2612 as described in [ebRIM].

2613 In the current version of this specification, a minimalist approach has been specified for
 2614 Registry security. The philosophy is that “Any *known* entity can publish content and
 2615 *anyone* can view published content.” The Registry information model has been
 2616 designed to allow more sophisticated security policies in future versions of this
 2617 specification.

2618 **9.1 Integrity of Registry Content**

2619 It is assumed that most business registries do not have the resources to validate the
2620 veracity of the content submitted to them. The minimal integrity that the Registry must
2621 provide is to ensure that content submitted by a Submitting Organization (SO) is
2622 maintained in the Registry without any tampering either *en-route* or *within* the Registry.
2623 Furthermore, the Registry must make it possible to identify the SO for any Registry
2624 content unambiguously.

2625 **9.1.1 Message Payload Signature**

2626 Integrity of Registry content requires that all submitted content must be signed by the
2627 Registry client as defined by [SEC]. The signature on the submitted content ensures
2628 that:

- 2629 • The content has not been tampered with en-route or within the Registry.
- 2630 • The content's veracity can be ascertained by its association with a specific
2631 submitting organization

2632 **9.2 Authentication**

2633 The Registry must be able to authenticate the identity of the Principal associated with
2634 client requests. *Authentication* is required to identify the ownership of content as well as
2635 to identify what "privileges" a Principal can be assigned with respect to the specific
2636 objects in the Registry.

2637 The Registry must perform Authentication on a per request basis. From a security point
2638 of view, all messages are independent and there is no concept of a session
2639 encompassing multiple messages or conversations. Session support may be added as
2640 an optimization feature in future versions of this specification.

2641 The Registry must implement a credential-based authentication mechanism based on
2642 digital certificates and signatures. The Registry uses the certificate DN from the
2643 signature to authenticate the user.

2644 **9.2.1 Message Header Signature**

2645 Message headers may be signed by the sending ebXML Messaging Service as defined
2646 by [SEC]. Since this specification is not yet finalized, this version does not require that
2647 the message header be signed. In the absence of a message header signature, the
2648 payload signature is used to authenticate the identity of the requesting client.

2649 **9.3 Confidentiality**

2650 **9.3.1 On-the-wire Message Confidentiality**

2651 It is suggested but not required that message payloads exchanged between clients and
 2652 the Registry be encrypted during transmission. Payload encryption must abide by any
 2653 restrictions set forth in [SEC].

2654 **9.3.2 Confidentiality of Registry Content**

2655 In the current version of this specification, there are no provisions for confidentiality of
 2656 Registry content. All content submitted to the Registry may be discovered and read by
 2657 *any* client. Therefore, the Registry must be able to decrypt any submitted content after it
 2658 has been received and prior to storing it in its repository. This implies that the Registry
 2659 and the client have an a priori agreement regarding encryption algorithm, key exchange
 2660 agreements, etc. This service is not addressed in this specification.

2661 **9.4 Authorization**

2662 The Registry must provide an authorization mechanism based on the information model
 2663 defined in [ebRIM]. In this version of the specification the authorization mechanism is
 2664 based on a default Access Control Policy defined for a pre-defined set of roles for
 2665 Registry users. Future versions of this specification will allow for custom Access Control
 2666 Policies to be defined by the Submitting Organization.

2667 **9.4.1 Pre-defined Roles For Registry Users**

2668 The following roles must be pre-defined in the Registry:

Role	Description
ContentOwner	The submitter or owner of a Registry content. Submitting Organization (SO) in ISO 11179
RegistryAdministrator	A "super" user that is an administrator of the Registry. Registration Authority (RA) in ISO 11179
RegistryGuest	Any unauthenticated user of the Registry. Clients that browse the Registry do not need to be authenticated.

2669 **9.4.2 Default Access Control Policies**

2670 The Registry must create a default AccessControlPolicy object that grants the default
 2671 permissions to Registry users based upon their assigned role.

2672 The following table defines the Permissions granted by the Registry to the various pre-
 2673 defined roles for Registry users based upon the default AccessControlPolicy.

2674

Role	Permissions
ContentOwner	Access to <i>all</i> methods on Registry Objects that are owned by the ContentOwner.
RegistryAdministrator	Access to <i>all</i> methods on <i>all</i> Registry Objects
RegistryGuest	Access to <i>all</i> read-only (getXXX) methods on <i>all</i> Registry Objects (read-only access to all content).

2675

2676 The following list summarizes the default role-based AccessControlPolicy:

- 2677 • The Registry must implement the default AccessControlPolicy and associate it
2678 with all Objects in the Registry
- 2679 • Anyone can publish content, but needs to be authenticated
- 2680 • Anyone can access the content without requiring authentication
- 2681 • The ContentOwner has access to all methods for Registry Objects owned by
2682 them
- 2683 • The RegistryAdministrator has access to all methods on all Registry Objects
- 2684 • Unauthenticated clients can access all read-only (getXXX) methods
- 2685 • At the time of content submission, the Registry must assign the default
2686 ContentOwner role to the Submitting Organization (SO) as authenticated by the
2687 credentials in the submission message. In the current version of this
2688 specification, it will be the DN as identified by the certificate
- 2689 • Clients that browse the Registry need not use certificates. The Registry must
2690 assign the default RegistryGuest role to such clients.

2691 **Appendix A ebXML Registry DTD Definition**

2692 The following is the definition for the various ebXML Message payloads described in
2693 this document.

```

2694
2695 <?xml version="1.0" encoding="UTF-8"?>
2696 <!-- Begin information model mapping. -->
2697
2698 <!--
2699 ObjectAttributes are attributes from the RegistryObject interface in ebRIM.
2700
2701 id may be empty. If specified it may be in urn:uuid format or be in some
2702 arbitrary format. If id is empty registry must generate globally unique id.
```

2703
2704 If id is provided and in proper UUID syntax (starts with urn:uuid:)
2705 registry will honour it.
2706
2707 If id is provided and is not in proper UUID syntax then it is used for
2708 linkage within document and is ignored by the registry. In this case the
2709 registry generates a UUID for id attribute.
2710
2711 id must not be null when object is being retrieved from the registry.
2712 -->
2713 <!ENTITY % ObjectAttributes "
2714 id ID #IMPLIED
2715 name CDATA #IMPLIED
2716 description CDATA #IMPLIED
2717 ">
2718
2719 <!--
2720 Use as a proxy for an Object that is in the registry already.
2721 Specifies the id attribute of the object in the registry as its id attribute.
2722 id attribute in ObjectAttributes is exactly the same syntax and semantics as
2723 id attribute in RegistryObject.
2724 -->
2725 <!ELEMENT ObjectRef EMPTY>
2726 <!ATTLIST ObjectRef
2727 id ID #IMPLIED
2728 >
2729
2730 <!ELEMENT ObjectRefList (ObjectRef)*>
2731
2732 <!--
2733 RegistryEntryAttributes are attributes from the RegistryEntry interface
2734 in ebRIM.
2735 It inherits ObjectAttributes
2736 -->
2737 <!ENTITY % RegistryEntryAttributes "%ObjectAttributes;
2738 majorVersion CDATA '1'
2739 minorVersion CDATA '0'
2740 status CDATA #IMPLIED
2741 userVersion CDATA #IMPLIED
2742 stability CDATA 'Dynamic'
2743 expirationDate CDATA #IMPLIED">
2744
2745 <!ELEMENT RegistryEntry (SlotList?)>
2746 <!ATTLIST RegistryEntry
2747 %RegistryEntryAttributes; >
2748 <!ELEMENT Value (#PCDATA)>
2749 <!ELEMENT ValueList (Value*)>
2750 <!ELEMENT Slot (ValueList?)>
2751 <!ATTLIST Slot
2752 name CDATA #REQUIRED
2753 slotType CDATA #IMPLIED
2754 >
2755 <!ELEMENT SlotList (Slot*)>
2756
2757 <!--
2758 ExtrinsicObject are attributes from the ExtrinsicObject interface in ebRIM.

```
2759 It inherits RegistryEntryAttributes
2760 -->
2761
2762
2763 <!ELEMENT ExtrinsicObject EMPTY >
2764 <!ATTLIST ExtrinsicObject
2765     %RegistryEntryAttributes;
2766     contentURI CDATA #REQUIRED
2767     mimeType CDATA #IMPLIED
2768     objectType CDATA #REQUIRED
2769     opaque (true | false) "false"
2770 >
2771
2772
2773 <!ENTITY % IntrinsicObjectAttributes " %RegistryEntryAttributes;">
2774
2775 <!-- Leaf classes that reflect the concrete classes in ebRIM -->
2776 <!ELEMENT RegistryEntryList
2777 (Association | Classification | ClassificationNode | Package |
2778 ExternalLink | ExternalIdentifier | Organization |
2779 ExtrinsicObject | ObjectRef)*>
2780
2781 <!--
2782 An ExternalLink specifies a link from a RegistryEntry and an external URI
2783 -->
2784 <!ELEMENT ExternalLink EMPTY>
2785 <!ATTLIST ExternalLink
2786     %IntrinsicObjectAttributes;
2787     externalURI CDATA #IMPLIED
2788 >
2789
2790 <!--
2791 An ExternalIdentifier provides an identifier for a RegistryEntry
2792
2793 The value is the value of the identifier (e.g. the social security number)
2794 -->
2795 <!ELEMENT ExternalIdentifier EMPTY>
2796 <!ATTLIST ExternalIdentifier
2797     %IntrinsicObjectAttributes;
2798     value CDATA #REQUIRED
2799 >
2800
2801 <!--
2802 An Association specifies references to two previously submitted
2803 registry entrys.
2804
2805 The sourceObject is id of the sourceObject in association
2806 The targetObject is id of the targetObject in association
2807 -->
2808 <!ELEMENT Association EMPTY>
2809 <!ATTLIST Association
2810     %IntrinsicObjectAttributes;
2811     sourceRole CDATA #IMPLIED
2812     targetRole CDATA #IMPLIED
2813     associationType CDATA #REQUIRED
2814     bidirection (true | false) "false"
```

```
2815         sourceObject IDREF #REQUIRED
2816         targetObject IDREF #REQUIRED
2817     >
2818
2819     <!--
2820     A Classification specifies references to two registry entries.
2821
2822     The classifiedObject is id of the Object being classified.
2823     The classificationNode is id of the ClassificationNode classifying the object
2824     -->
2825     <!ELEMENT Classification EMPTY>
2826     <!ATTLIST Classification
2827         %IntrinsicObjectAttributes;
2828         classifiedObject IDREF #REQUIRED
2829         classificationNode IDREF #REQUIRED
2830     >
2831
2832     <!--
2833     A Package is a named collection of objects.
2834     -->
2835     <!ELEMENT Package EMPTY>
2836     <!ATTLIST Package
2837         %IntrinsicObjectAttributes;
2838     >
2839
2840     <!-- Attributes inherited by various types of telephone number elements -->
2841     <!ENTITY % TelephoneNumberAttributes " areaCode    CDATA    #REQUIRED
2842         contryCode CDATA    #REQUIRED
2843         extension  CDATA    #IMPLIED
2844         number     CDATA    #REQUIRED
2845         url        CDATA    #IMPLIED">
2846     <!ELEMENT TelephoneNumber EMPTY>
2847     <!ATTLIST TelephoneNumber
2848         %TelephoneNumberAttributes;
2849     >
2850     <!ELEMENT FaxNumber EMPTY>
2851     <!ATTLIST FaxNumber
2852         %TelephoneNumberAttributes;
2853     >
2854
2855     <!ELEMENT PagerNumber EMPTY>
2856     <!ATTLIST PagerNumber
2857         %TelephoneNumberAttributes;
2858     >
2859
2860     <!ELEMENT MobileTelephoneNumber EMPTY>
2861     <!ATTLIST MobileTelephoneNumber
2862         %TelephoneNumberAttributes;
2863     >
2864     <!-- PostalAddress -->
2865     <!ELEMENT PostalAddress EMPTY>
2866     <!ATTLIST PostalAddress
2867         city CDATA #REQUIRED
2868         country CDATA #REQUIRED
2869         postalCode CDATA #REQUIRED
2870         state CDATA #IMPLIED
```

```
2871         street CDATA #REQUIRED
2872     >
2873     <!-- PersonName -->
2874     <!ELEMENT PersonName EMPTY>
2875     <!ATTLIST PersonName
2876         firstName CDATA #REQUIRED
2877         middleName CDATA #IMPLIED
2878         lastName CDATA #REQUIRED
2879     >
2880
2881     <!-- Organization -->
2882     <!ELEMENT Organization (PostalAddress, FaxNumber?, TelephoneNumber)>
2883     <!ATTLIST Organization
2884         %IntrinsicObjectAttributes;
2885         parent IDREF #IMPLIED
2886         primaryContact IDREF #REQUIRED
2887     >
2888
2889     <!ELEMENT User (PersonName, PostalAddress, TelephoneNumber,
2890         MobileTelephoneNumber?,
2891         FaxNumber?, PagerNumber?)>
2892     <!ATTLIST User
2893         %ObjectAttributes;
2894         organization IDREF #IMPLIED
2895         email CDATA #IMPLIED
2896         url CDATA #IMPLIED
2897     >
2898
2899     <!ELEMENT AuditableEvent EMPTY>
2900     <!ATTLIST AuditableEvent
2901         %ObjectAttributes;
2902         eventType CDATA #REQUIRED
2903         registryEntry IDREF #REQUIRED
2904         timestamp CDATA #REQUIRED
2905         user IDREF #REQUIRED
2906     >
2907
2908     <!--
2909     ClassificationNode is used to submit a Classification tree to the Registry.
2910
2911     parent is the id to the parent node. code is an optional code value for a
2912         ClassificationNode
2913     often defined by an external taxonomy (e.g. NAICS)
2914     -->
2915     <!ELEMENT ClassificationNode EMPTY>
2916     <!ATTLIST ClassificationNode
2917         %IntrinsicObjectAttributes;
2918         parent IDREF #IMPLIED
2919         code CDATA #IMPLIED
2920     >
2921
2922     <!--
2923     End information model mapping.
2924
2925     Begin Registry Services Interface
2926
```

```
2927 <!ELEMENT RequestAcceptedResponse EMPTY>
2928 <!ATTLIST RequestAcceptedResponse
2929     xml:lang NMTOKEN #REQUIRED
2930 >
2931 <!--
2932
2933 The SubmitObjectsRequest allows one to submit a list of RegistryEntry
2934 elements. Each RegistryEntry element provides metadata for a single submitted
2935 object. Note that the repository item being submitted is in a separate
2936 document that is not in this DTD. The ebXML Messaging Services Specification
2937 defines packaging, for submission, of the metadata of a repository item with
2938 the repository item itself. The value of the contentURI attribute of the
2939 ExtrinsicObject element must be the same as the xlink:href attribute within
2940 the Reference element within the Manifest element of the MessageHeader.
2941 -->
2942 <!ELEMENT SubmitObjectsRequest (RegistryEntryList)>
2943 <!ELEMENT AddSlotsRequest (ObjectRef, SlotList)+>
2944 <!-- Only need name in Slot within SlotList -->
2945 <!ELEMENT RemoveSlotsRequest (ObjectRef, SlotList)+>
2946 <!--
2947 The ObjectRefList is the list of
2948 refs to the registry entrys being approved.
2949 -->
2950 <!ELEMENT ApproveObjectsRequest (ObjectRefList)>
2951 <!--
2952 The ObjectRefList is the list of
2953 refs to the registry entrys being deprecated.
2954 -->
2955 <!ELEMENT DeprecateObjectsRequest (ObjectRefList)>
2956 <!--
2957 The ObjectRefList is the list of
2958 refs to the registry entrys being removed
2959 -->
2960 <!ELEMENT RemoveObjectsRequest (ObjectRefList)>
2961 <!ATTLIST RemoveObjectsRequest
2962     deletionScope (DeleteAll | DeleteRepositoryItemOnly) "DeleteAll"
2963 >
2964 <!ELEMENT GetRootClassificationNodesRequest EMPTY>
2965 <!--
2966 The namePattern follows SQL-92 syntax for the pattern specified in
2967 LIKE clause. It allows for selecting only those root nodes that match
2968 the namePattern. The default value of '*' matches all root nodes.
2969 -->
2970 <!ATTLIST GetRootClassificationNodesRequest
2971     namePattern CDATA "*"
2972 >
2973 <!--
2974 The response includes one or more ClassificationNodes
2975 -->
2976 <!ELEMENT GetRootClassificationNodesResponse ( ClassificationNode+ )>
2977 <!--
2978 Get the classification tree under the ClassificationNode specified parentRef.
2979
2980 If depth is 1 just fetch immediate child
2981 nodes, otherwise fetch the descendant tree upto the specified depth level.
2982 If depth is 0 that implies fetch entire sub-tree
```

```
2983 -->
2984 <!ELEMENT GetClassificationTreeRequest EMPTY>
2985 <!ATTLIST GetClassificationTreeRequest
2986     parent CDATA #REQUIRED
2987     depth CDATA "1"
2988 >
2989 <!--
2990 The response includes one or more ClassificationNodes which includes only
2991 immediate ClassificationNode children nodes if depth attribute in
2992 GetClassificationTreeRequest was 1, otherwise the decendent nodes
2993 upto specified depth level are returned.
2994 -->
2995 <!ELEMENT GetClassificationTreeResponse ( ClassificationNode+ )>
2996 <!--
2997 Get refs to all registry entrys that are classified by all the
2998 ClassificationNodes specified by ObjectRefList.
2999 Note this is an implicit logical AND operation
3000 -->
3001 <!ELEMENT GetClassifiedObjectsRequest (ObjectRefList)>
3002 <!--
3003 objectType attribute can specify the type of objects that the registry
3004 client is interested in, that is classified by this ClassificationNode.
3005 It is a String that matches a choice in the type attribute of
3006     ExtrinsicObject.
3007 The default value of '*' implies that client is interested in all types
3008 of registry entrys that are classified by the specified ClassificationNode.
3009 -->
3010 <!--
3011 The response includes a RegistryEntryList which has zero or more
3012 RegistryEntrys that are classified by the ClassificationNodes
3013 specified in the ObjectRefList in GetClassifiedObjectsRequest.
3014 -->
3015 <!ELEMENT GetClassifiedObjectsResponse ( RegistryEntryList )>
3016 <!--
3017 An Ad hoc query request specifies a query string as defined by [RS] in the
3018     queryString attribute
3019 -->
3020 <!ELEMENT AdhocQueryRequest (FilterQuery | ReturnRegistryEntry |
3021     ReturnRepositoryItem | SQLQuery)>
3022 <!ELEMENT SQLQuery (#PCDATA)>
3023 <!--
3024 The response includes a RegistryEntryList which has zero or more
3025 RegistryEntrys that match the query specified in AdhocQueryRequest.
3026 -->
3027 <!ELEMENT AdhocQueryResponse
3028 ( RegistryEntryList |
3029     FilterQueryResult |
3030     ReturnRegistryEntryResult |
3031     ReturnRepositoryItemResult )>
3032 <!--
3033 Gets the actual content (not metadata) specified by the ObjectRefList
3034 -->
3035 <!ELEMENT GetContentRequest (ObjectRefList)>
3036 <!--
3037 The GetObjectsResponse will have no sub-elements if there were no errors.
3038 The actual contents will be in the other payloads of the message.
```

```
3039 -->
3040 <!ELEMENT GetContentResponse EMPTY >
3041 <!--
3042 Describes the capability profile for the registry and what optional features
3043 are supported
3044 -->
3045 <!ELEMENT RegistryProfile (OptionalFeaturesSupported)>
3046 <!ATTLIST RegistryProfile
3047     version CDATA #REQUIRED
3048 >
3049
3050 <!ELEMENT OptionalFeaturesSupported EMPTY>
3051 <!ATTLIST OptionalFeaturesSupported
3052     sqlQuery (true | false) "false"
3053     xQuery (true | false) "false"
3054 >
3055 <!-- Begin FilterQuery DTD -->
3056 <!ELEMENT FilterQuery (RegistryEntryQuery | AuditableEventQuery |
3057     ClassificationNodeQuery |
3058     RegistryPackageQuery |
3059     OrganizationQuery)>
3060 <!ELEMENT FilterQueryResult (RegistryEntryQueryResult |
3061     AuditableEventQueryResult |
3062     ClassificationNodeQueryResult |
3063     RegistryPackageQueryResult |
3064     OrganizationQueryResult)>
3065 <!ELEMENT RegistryEntryQueryResult (RegistryEntryView*)>
3066 <!ELEMENT RegistryEntryView EMPTY>
3067 <!ATTLIST RegistryEntryView
3068     objectURN CDATA #REQUIRED
3069     contentURI CDATA #IMPLIED
3070     objectID CDATA #IMPLIED
3071 >
3072 <!ELEMENT AuditableEventQueryResult (AuditableEventView*)>
3073 <!ELEMENT AuditableEventView EMPTY>
3074 <!ATTLIST AuditableEventView
3075     objectID CDATA #REQUIRED
3076     timestamp CDATA #REQUIRED
3077 >
3078 <!ELEMENT ClassificationNodeQueryResult (ClassificationNodeView*)>
3079 <!ELEMENT ClassificationNodeView EMPTY>
3080 <!ATTLIST ClassificationNodeView
3081     objectURN CDATA #REQUIRED
3082     contentURI CDATA #IMPLIED
3083     objectID CDATA #IMPLIED
3084 >
3085 <!ELEMENT RegistryPackageQueryResult (RegistryPackageView*)>
3086 <!ELEMENT RegistryPackageView EMPTY>
3087 <!ATTLIST RegistryPackageView
3088     objectURN CDATA #REQUIRED
3089     contentURI CDATA #IMPLIED
3090     objectID CDATA #IMPLIED
3091 >
3092 <!ELEMENT OrganizationQueryResult (OrganizationView*)>
3093 <!ELEMENT OrganizationView EMPTY>
3094 <!ATTLIST OrganizationView
```



```
3095         orgURN CDATA #REQUIRED
3096         objectID CDATA #IMPLIED
3097     >
3098
3099     <!ELEMENT RegistryEntryQuery
3100         ( RegistryEntryFilter?,
3101           SourceAssociationBranch*,
3102           TargetAssociationBranch*,
3103           HasClassificationBranch*,
3104           SubmittingOrganizationBranch?,
3105           ResponsibleOrganizationBranch?,
3106           ExternalIdentifierFilter*,
3107           ExternalLinkFilter*,
3108           SlotFilter*,
3109           HasAuditableEventBranch*           )>
3110
3111     <!ELEMENT SourceAssociationBranch (AssociationFilter?, RegistryEntryFilter?)>
3112     <!ELEMENT TargetAssociationBranch (AssociationFilter?, RegistryEntryFilter?)>
3113     <!ELEMENT HasClassificationBranch (ClassificationFilter?,
3114                                     ClassificationNodeFilter?)>
3115     <!ELEMENT SubmittingOrganizationBranch (OrganizationFilter?, ContactFilter?)>
3116     <!ELEMENT ResponsibleOrganizationBranch (OrganizationFilter?,
3117                                           ContactFilter?)>
3118     <!ELEMENT HasAuditableEventBranch (AuditableEventFilter?, UserFilter?,
3119                                       OrganizationFilter?)>
3120     <!ELEMENT AuditableEventQuery
3121         (AuditableEventFilter?, RegistryEntryQuery*, InvokedByBranch? )>
3122
3123     <!ELEMENT InvokedByBranch
3124         ( UserFilter?, OrganizationQuery? )>
3125
3126     <!ELEMENT ClassificationNodeQuery (ClassificationNodeFilter?,
3127                                     PermitsClassificationBranch*,
3128                                     HasParentNode?, HasSubnode*)>
3129     <!ELEMENT PermitsClassificationBranch (ClassificationFilter?,
3130                                         RegistryEntryQuery?)>
3131     <!ELEMENT HasParentNode (ClassificationNodeFilter?, HasParentNode?)>
3132     <!ELEMENT HasSubnode (ClassificationNodeFilter?, HasSubnode*)>
3133     <!ELEMENT RegistryPackageQuery (PackageFilter?, HasMemberBranch*)>
3134     <!ELEMENT HasMemberBranch (RegistryEntryQuery?)>
3135     <!ELEMENT OrganizationQuery (OrganizationFilter?, SubmitsRegistryEntry*,
3136                                HasParentOrganization?,
3137                                InvokesEventBranch*,
3138                                ContactFilter*)>
3139     <!ELEMENT SubmitsRegistryEntry (RegistryEntryQuery?)>
3140     <!ELEMENT HasParentOrganization (OrganizationFilter?,
3141                                    HasParentOrganization?)>
3142     <!ELEMENT InvokesEventBranch (UserFilter?, AuditableEventFilter?,
3143                                 RegistryEntryQuery?)>
3144     <!ELEMENT ReturnRegistryEntry (RegistryEntryQuery, WithClassifications?,
3145                                  WithSourceAssociations?,
3146                                  WithTargetAssociations?,
3147                                  WithAuditableEvents?,
3148                                  WithExternalLinks?)>
3149     <!ELEMENT WithClassifications (ClassificationFilter?)>
3150     <!ELEMENT WithSourceAssociations (AssociationFilter?)>
```

```
3151 <!ELEMENT WithTargetAssociations (AssociationFilter?)>
3152 <!ELEMENT WithAuditableEvents (AuditableEventFilter?)>
3153 <!ELEMENT WithExternalLinks (ExternalLinkFilter?)>
3154 <!ELEMENT ReturnRegistryEntryResult (RegistryEntryMetadata*)>
3155 <!ELEMENT RegistryEntryMetadata (RegistryEntry, Classification*,
3156                               SourceAssociations?,
3157                               TargetAssociations?,
3158                               AuditableEvent*, ExternalLink*)>
3159 <!ELEMENT SourceAssociations (Association*)>
3160 <!ELEMENT TargetAssociations (Association*)>
3161 <!ELEMENT ReturnRepositoryItem (RegistryEntryQuery,
3162                               RecursiveAssociationOption?,
3163                               WithDescription?)>
3164 <!ELEMENT RecursiveAssociationOption (AssociationType+)>
3165 <!ATTLIST RecursiveAssociationOption
3166     depthLimit CDATA #IMPLIED
3167 >
3168 <!ELEMENT AssociationType EMPTY>
3169 <!ATTLIST AssociationType
3170     role CDATA #REQUIRED
3171 >
3172 <!ELEMENT WithDescription EMPTY>
3173 <!ELEMENT ReturnRepositoryItemResult (RepositoryItem*)>
3174 <!ELEMENT RepositoryItem (RegistryPackage | ExtrinsicObject | WithdrawnObject
3175                               | ExternalLink)>
3176 <!ATTLIST RepositoryItem
3177     identifier CDATA #REQUIRED
3178     name CDATA #REQUIRED
3179     contentURI CDATA #REQUIRED
3180     objectType CDATA #REQUIRED
3181     status CDATA #REQUIRED
3182     stability CDATA #REQUIRED
3183     description CDATA #IMPLIED
3184 >
3185 <!ELEMENT RegistryPackage EMPTY>
3186 <!ELEMENT WithdrawnObject EMPTY>
3187 <!ELEMENT ExternalLinkItem EMPTY>
3188 <!ELEMENT ObjectFilter (Clause)>
3189 <!ELEMENT RegistryEntryFilter (Clause)>
3190 <!ELEMENT IntrinsicObjectFilter (Clause)>
3191 <!ELEMENT ExtrinsicObjectFilter (Clause)>
3192 <!ELEMENT PackageFilter (Clause)>
3193 <!ELEMENT OrganizationFilter (Clause)>
3194 <!ELEMENT ContactFilter (Clause)>
3195 <!ELEMENT ClassificationNodeFilter (Clause)>
3196 <!ELEMENT AssociationFilter (Clause)>
3197 <!ELEMENT ClassificationFilter (Clause)>
3198 <!ELEMENT ExternalLinkFilter (Clause)>
3199 <!ELEMENT SlotFilter (Clause)>
3200 <!ELEMENT ExternalIdentifierFilter (Clause)>
3201 <!ELEMENT AuditableEventFilter (Clause)>
3202 <!ELEMENT UserFilter (Clause)>
3203
3204 <!--
3205 The following lines define the XML syntax for Clause.
3206 -->
```

```

3207 <!ELEMENT Clause (SimpleClause | CompoundClause)>
3208 <!ELEMENT SimpleClause (BooleanClause | RationalClause | StringClause)>
3209 <!ATTLIST SimpleClause
3210     leftArgument CDATA #REQUIRED
3211 >
3212 <!ELEMENT CompoundClause (Clause, Clause+)>
3213 <!ATTLIST CompoundClause
3214     connectivePredicate (And | Or) #REQUIRED
3215 >
3216 <!ELEMENT BooleanClause EMPTY>
3217 <!ATTLIST BooleanClause
3218     booleanPredicate (true | false) #REQUIRED
3219 >
3220 <!ELEMENT RationalClause (IntClause | FloatClause)>
3221 <!ATTLIST RationalClause
3222     logicalPredicate (LE | LT | GE | GT | EQ | NE) #REQUIRED
3223 >
3224 <!ELEMENT IntClause (#PCDATA)>
3225 <!ATTLIST IntClause
3226     e-dtype NMTOKEN #FIXED "int"
3227 >
3228 <!ELEMENT FloatClause (#PCDATA)>
3229 <!ATTLIST FloatClause
3230     e-dtype NMTOKEN #FIXED "float"
3231 >
3232 <!ELEMENT StringClause (#PCDATA)>
3233 <!ATTLIST StringClause
3234     stringPredicate
3235     (contains | -contains |
3236     startswith | -startswith |
3237     equal | -equal |
3238     endswith | -endswith) #REQUIRED
3239 >
3240 <!-- End FilterQuery DTD -->
3241
3242 <!-- Begin RegistryError definition -->
3243 <!-- The RegistryErrorList is derived from the ErrorList element from the
3244     ebXML Message Service Specification -->
3245 <!ELEMENT RegistryErrorList ( RegistryError+ )>
3246 <!ATTLIST RegistryErrorList
3247     highestSeverity ( Warning | Error ) 'Warning' >
3248
3249 <!ELEMENT RegistryError (#PCDATA) >
3250 <!ATTLIST RegistryError
3251     codeContext CDATA #REQUIRED
3252     errorCode CDATA #REQUIRED
3253     severity ( Warning | Error ) 'Warning'
3254     location CDATA #IMPLIED
3255     xml:lang NMTOKEN #IMPLIED>
3256
3257 <!ELEMENT RegistryResponse
3258 (( AdhocQueryResponse |
3259     GetContentResponse |
3260     GetClassificationTreeResponse |
3261     GetClassifiedObjectsResponse |
3262     GetRootClassificationNodesResponse )? ,

```

```
3263     RegistryErrorList? )>
3264 <!ATTLIST RegistryResponse
3265     status (success | failure ) #REQUIRED >
3266
3267 <!-- The contrived root node -->
3268
3269 <!ELEMENT RootElement
3270     ( SubmitObjectsRequest |
3271       ApproveObjectsRequest |
3272       DeprecateObjectsRequest |
3273       RemoveObjectsRequest |
3274       GetRootClassificationNodesRequest |
3275       GetClassificationTreeRequest |
3276       GetClassifiedObjectsRequest |
3277       AdhocQueryRequest |
3278       GetContentRequest |
3279       AddSlotsRequest |
3280       RemoveSlotsRequest |
3281       RegistryResponse |
3282       RegistryProfile) >
3283
3284 <!ELEMENT Href (#PCDATA )>
3285
3286 <!ELEMENT XMLDocumentErrorLocn (DocumentId , Xpath )>
3287
3288 <!ELEMENT DocumentId (#PCDATA )>
3289
3290 <!ELEMENT Xpath (#PCDATA)>
```

3291 **Appendix B**

3292 **Interpretation of UML Diagrams**

3293 This section describes in *abstract terms* the conventions used to define ebXML
3294 business process description in UML.

3295 **B.1 UML Class Diagram**

3296 A UML class diagram is used to describe the Service Interfaces (as defined by [ebCPP])
3297 required to implement an ebXML Registry Services and clients. See Figure 2 on page
3298 14 for an example. The UML class diagram contains:

- 3299
- 3300 1. A collection of UML interfaces where each interface represents a Service
3301 Interface for a Registry service.
 - 3302 2. Tabular description of methods on each interface where each method represents
3303 an Action (as defined by [ebCPP]) within the Service Interface representing the
3304 UML interface.

- 3305 3. Each method within a UML interface specifies one or more parameters, where
3306 the type of each method argument represents the ebXML message type that is
3307 exchanged as part of the Action corresponding to the method. Multiple
3308 arguments imply multiple payload documents within the body of the
3309 corresponding ebXML message.

3310 **B.2 UML Sequence Diagram**

3311 A UML sequence diagram is used to specify the business protocol representing the
3312 interactions between the UML interfaces for a Registry specific ebXML business
3313 process. A UML sequence diagram provides the necessary information to determine the
3314 sequencing of messages, request to response association as well as request to error
3315 response association as described by [ebCPP].

3316 Each sequence diagram shows the sequence for a specific conversation protocol as
3317 method calls from the requestor to the responder. Method invocation may be
3318 synchronous or asynchronous based on the UML notation used on the arrow-head for
3319 the link. A half arrow-head represents asynchronous communication. A full arrow-head
3320 represents synchronous communication.

3321 Each method invocation may be followed by a response method invocation from the
3322 responder to the requestor to indicate the ResponseName for the previous Request.
3323 Possible error response is indicated by a conditional response method invocation from
3324 the responder to the requestor. See on page 20 for an example.

3325 **Appendix C SQL Query**

3326 **C.1 SQL Query Syntax Specification**

3327 This section specifies the rules that define the SQL Query syntax as a subset of
3328 SQL-92. The terms enclosed in angle brackets are defined in [SQL] or in
3329 [SQL/PSM]. The SQL query syntax conforms to the <query specification>, modulo
3330 the restrictions identified below:

- 3331 1. A <select list> may contain at most one <select sublist>.
- 3332 2. In a <select list> must be is a single column whose data type is UUID, from the
3333 table in the <from clause>.
- 3334 3. A <derived column> may not have an <as clause>.
- 3335 4. <table expression> does not contain the optional <group by clause> and <having
3336 clause> clauses.
- 3337 5. A <table reference> can only consist of <table name> and <correlation name>.
- 3338 6. A <table reference> does not have the optional AS between <table name> and
3339 <correlation name>.

- 3340 7. There can only be one <table reference> in the <from clause>.
- 3341 8. Restricted use of sub-queries is allowed by the syntax as follows. The <in
- 3342 predicate> allows for the right hand side of the <in predicate> to be limited to a
- 3343 restricted <query specification> as defined above.
- 3344 9. A <search condition> within the <where clause> may not include a <query
- 3345 expression>.
- 3346 10. The SQL query syntax allows for the use of <sql invoked routines>
- 3347 invocation from [SQL/PSM] as the RHS of the <in predicate>.

3348 **C.2 Non-Normative BNF for Query Syntax Grammar**

3349 The following BNF exemplifies the grammar for the registry query syntax. It is provided
 3350 here as an aid to implementors. Since this BNF is not based on [SQL] it is provided as
 3351 non-normative syntax. For the normative syntax rules see Appendix C.1.

```

3352 /*****
3353 * The Registry Query (Subset of SQL-92) grammar starts here
3354 *****/
3355 RegistryQuery = SQLSelect [ ";" ]
3356
3357 SQLSelect = "SELECT" SQLSelectCols "FROM" SQLTableList [ SQLWhere ]
3358
3359 SQLSelectCols = ID
3360
3361 SQLTableList = SQLTableRef
3362
3363 SQLTableRef = ID
3364
3365 SQLWhere = "WHERE" SQLOrExpr
3366
3367 SQLOrExpr = SQLAndExpr ( "OR" SQLAndExpr ) *
3368
3369 SQLAndExpr = SQLNotExpr ( "AND" SQLNotExpr ) *
3370
3371 SQLNotExpr = [ "NOT" ] SQLCompareExpr
3372
3373 SQLCompareExpr =
3374   (SQLColRef "IS") SQLIsClause
3375   | SQLSumExpr [ SQLCompareExprRight ]
3376
3377 SQLCompareExprRight =
3378   SQLLikeClause
3379   | SQLInClause
3380   | SQLCompareOp SQLSumExpr
3381
3382 SQLCompareOp =
3383   "="
3384   | "<>"
3385   | ">"
3386   | ">="
3387   | "<"
3388   | "<="
3389
3390 SQLInClause = [ "NOT" ] "IN" "(" SQLLValueList ")"
3391
3392
3393
3394
3395
    
```

```

3396 SQLValueList = SQLValueElement ( "," SQLValueElement ) *
3397
3398 SQLValueElement = "NULL" | SQLSelect
3399
3400 SQLIsClause = SQLColRef "IS" [ "NOT" ] "NULL"
3401
3402 SQLLikeClause = [ "NOT" ] "LIKE" SQLPattern
3403
3404 SQLPattern = STRING_LITERAL
3405
3406 SQLLiteral =
3407     STRING_LITERAL
3408     | INTEGER_LITERAL
3409     | FLOATING_POINT_LITERAL
3410
3411 SQLColRef = SQLValue
3412
3413 SQLValue = SQLValueTerm
3414
3415 SQLValueTerm = ID ( "." ID ) *
3416
3417 SQLSumExpr = SQLProductExpr ( ( "+" | "-" ) SQLProductExpr ) *
3418
3419 SQLProductExpr = SQLUnaryExpr ( ( "*" | "/" ) SQLUnaryExpr ) *
3420
3421 SQLUnaryExpr = [ ( "+" | "-" ) ] SQLTerm
3422
3423 SQLTerm = "(" SQLOrExpr ")"
3424     | SQLColRef
3425     | SQLLiteral
3426
3427 INTEGER_LITERAL = ([ "0"-"9" ] ) +
3428
3429 FLOATING_POINT_LITERAL =
3430     ([ "0"-"9" ] ) + "." ([ "0"-"9" ] ) + ( EXPONENT ) ?
3431     | "." ([ "0"-"9" ] ) + ( EXPONENT ) ?
3432     | ([ "0"-"9" ] ) + EXPONENT
3433     | ([ "0"-"9" ] ) + ( EXPONENT ) ?
3434
3435 EXPONENT = [ "e", "E" ] ( [ "+" , "-" ] ) ? ([ "0"-"9" ] ) +
3436
3437 STRING_LITERAL: "'" (~[ "'" ] ) * ( '"' (~[ '"' ] ) * ) * "'"
3438
3439 ID = ( <LETTER> ) + ( "-" | "$" | "#" | <DIGIT> | <LETTER> ) *
3440 LETTER = [ "A"-"Z", "a"-"z" ]
3441 DIGIT = [ "0"-"9" ]

```

3442 C.3 Relational Schema For SQL Queries

```

3443
3444 --SQL Load file for creating the ebXML Registry tables
3445
3446
3447 --Minimal use of SQL-99 features in DDL is illustrative and may be easily mapped to SQL-92
3448
3449
3450 CREATE TYPE ShortName AS VARCHAR(64) NOT FINAL;
3451 CREATE TYPE LongName AS VARCHAR(128) NOT FINAL;
3452 CREATE TYPE FreeFormText AS VARCHAR(256) NOT FINAL;
3453
3454 CREATE TYPE UUID UNDER ShortName FINAL;
3455 CREATE TYPE URI UNDER LongName FINAL;
3456
3457 CREATE TABLE ExtrinsicObject (
3458
3459 --RegistryObject Attributes
3460     id                                UUID PRIMARY KEY NOT NULL,
3461     name                              LongName,

```

```

3462     description                               FreeFormText,
3463     accessControlPolicy                       UUID NOT NULL,
3464
3465 --Versionable attributes
3466     majorVersion                             INT DEFAULT 0 NOT NULL,
3467     minorVersion                             INT DEFAULT 1 NOT NULL,
3468
3469 --RegistryEntry attributes
3470     status                                    INT DEFAULT 0 NOT NULL,
3471     userVersion                              ShortName,
3472     stability                                INT     DEFAULT 0 NOT NULL,
3473     expirationDate                          TIMESTAMP,
3474
3475 --ExtrinsicObject attributes
3476     contentURI                               URI,
3477     mimeType                                 ShortName,
3478     objectType                              INT DEFAULT 0 NOT NULL,
3479     opaque                                  BOOLEAN DEFAULT false NOT NULL
3480 );
3481
3482 CREATE PROCEDURE RegistryEntry_associatedObjects(registryEntryId) {
3483 --Must return a collection of UUIDs for related RegistryEntry instances
3484 }
3485
3486 CREATE PROCEDURE RegistryEntry_auditTrail(registryEntryId) {
3487 --Must return an collection of UUIDs for AuditableEvents related to the RegistryEntry.
3488 --Collection must be in ascending order by timestamp
3489 }
3490
3491 CREATE PROCEDURE RegistryEntry_externalLinks(registryEntryId) {
3492 --Must return a collection of UUIDs for ExternalLinks annotating this RegistryEntry.
3493 }
3494
3495 CREATE PROCEDURE RegistryEntry_externalIdentifiers(registryEntryId) {
3496 --Must return a collection of UUIDs for ExternalIdentifiers for this RegistryEntry.
3497 }
3498
3499 CREATE PROCEDURE RegistryEntry_classificationNodes(registryEntryId) {
3500 --Must return a collection of UUIDs for ClassificationNodes classifying this RegistryEntry.
3501 }
3502
3503 CREATE PROCEDURE RegistryEntry_packages(registryEntryId) {
3504 --Must return a collection of UUIDs for Packages that this RegistryEntry belongs to.
3505 }
3506
3507 CREATE TABLE Package (
3508 --RegistryObject Attributes
3509     id                                    UUID PRIMARY KEY NOT NULL,
3510     name                                  LongName,
3511     description                            FreeFormText,
3512     accessControlPolicy                   UUID NOT NULL,
3513
3514 --Versionable attributes
3515     majorVersion                         INT DEFAULT 0 NOT NULL,
3516     minorVersion                         INT DEFAULT 1 NOT NULL,
3517
3518 --RegistryEntry attributes
3519     status                                INT DEFAULT 0 NOT NULL,
3520     userVersion                          ShortName,
3521     stability                             INT     DEFAULT 0 NOT NULL,
3522     expirationDate                        TIMESTAMP,
3523
3524 --Package attributes
3525 );
3526
3527 CREATE PROCEDURE Package_memberbjects(packageId) {
3528 --Must return a collection of UUIDs for RegistryEntrys that are memebers of this Package.
3529 }
3530
3531

```



```

3532
3533 CREATE TABLE ExternalLink (
3534
3535 --RegistryObject Attributes
3536     id                                UUID PRIMARY KEY NOT NULL,
3537     name                              LongName,
3538     description                       FreeFormText,
3539     accessControlPolicy               UUID NOT NULL,
3540
3541 --Versionable attributes
3542     majorVersion                      INT DEFAULT 0 NOT NULL,
3543     minorVersion                      INT DEFAULT 1 NOT NULL,
3544
3545 --RegistryEntry attributes
3546     status                            INT DEFAULT 0 NOT NULL,
3547     userVersion                       ShortName,
3548     stability                          INT     DEFAULT 0 NOT NULL,
3549     expirationDate                    TIMESTAMP,
3550
3551 --ExternalLink attributes
3552     externalURI                       URI NOT NULL
3553 );
3554
3555 CREATE PROCEDURE ExternalLink_linkedObjects(registryEntryId) {
3556 --Must return a collection of UUIDs for objects in this relationship
3557 }
3558
3559 CREATE TABLE ExternalIdentifier (
3560
3561 --RegistryObject Attributes
3562     id                                UUID PRIMARY KEY NOT NULL,
3563     name                              LongName,
3564     description                       FreeFormText,
3565     accessControlPolicy               UUID NOT NULL,
3566
3567 --Versionable attributes
3568     majorVersion                      INT DEFAULT 0 NOT NULL,
3569     minorVersion                      INT DEFAULT 1 NOT NULL,
3570
3571 --RegistryEntry attributes
3572     status                            INT DEFAULT 0 NOT NULL,
3573     userVersion                       ShortName,
3574     stability                          INT     DEFAULT 0 NOT NULL,
3575     expirationDate                    TIMESTAMP,
3576
3577 --ExternalIdentifier attributes
3578     value                             ShortName NOT NULL
3579 );
3580
3581
3582 --A SlotValue row represents one value of one slot in some
3583 --RegistryEntry
3584 CREATE TABLE SlotValue (
3585
3586 --RegistryObject Attributes
3587     registryEntry                     UUID     PRIMARY KEY NOT NULL,
3588
3589 --Slot attributes
3590     name                              LongName NOT NULL PRIMARY KEY NOT NULL,
3591     value                             ShortName NOT NULL
3592 );
3593
3594 CREATE TABLE Association (
3595 --RegistryObject Attributes
3596     id                                UUID PRIMARY KEY NOT NULL,
3597     name                              LongName,
3598     description                       FreeFormText,
3599     accessControlPolicy               UUID NOT NULL,
3600
3601 --Versionable attributes

```

```

3602     majorVersion                INT DEFAULT 0 NOT NULL,
3603     minorVersion                INT DEFAULT 1 NOT NULL,
3604
3605 --RegistryEntry attributes
3606     status                        INT DEFAULT 0 NOT NULL,
3607     userVersion                  ShortName,
3608     stability                    INT     DEFAULT 0 NOT NULL,
3609     expirationDate              TIMESTAMP,
3610
3611 --Association attributes
3612     associationType              INT NOT NULL,
3613     bidirectional                BOOLEAN DEFAULT false NOT NULL,
3614     sourceObject                 UUID NOT NULL,
3615     sourceRole                   ShortName,
3616     label                        ShortName,
3617     targetObject                 UUID NOT NULL,
3618     targetRole                   ShortName
3619 );
3620
3621 --Classification is currently identical to Association
3622 CREATE TABLE Classification (
3623 --RegistryObject Attributes
3624     id                            UUID PRIMARY KEY NOT NULL,
3625     name                          LongName,
3626     description                    FreeFormText,
3627     accessControlPolicy           UUID NOT NULL,
3628
3629 --Versionable attributes
3630     majorVersion                  INT DEFAULT 0 NOT NULL,
3631     minorVersion                  INT DEFAULT 1 NOT NULL,
3632
3633 --RegistryEntry attributes
3634     status                        INT DEFAULT 0 NOT NULL,
3635     userVersion                  ShortName,
3636     stability                    INT     DEFAULT 0 NOT NULL,
3637     expirationDate              TIMESTAMP,
3638
3639 --Classification attributes. Assumes not derived from Association
3640     sourceObject                 UUID NOT NULL,
3641     targetObject                 UUID NOT NULL,
3642 );
3643
3644 CREATE TABLE ClassificationNode (
3645 --RegistryObject Attributes
3646     id                            UUID PRIMARY KEY NOT NULL,
3647     name                          LongName,
3648     description                    FreeFormText,
3649     accessControlPolicy           UUID NOT NULL,
3650
3651 --Versionable attributes
3652     majorVersion                  INT DEFAULT 0 NOT NULL,
3653     minorVersion                  INT DEFAULT 1 NOT NULL,
3654
3655 --RegistryEntry attributes
3656     status                        INT DEFAULT 0 NOT NULL,
3657     userVersion                  ShortName,
3658     stability                    INT     DEFAULT 0 NOT NULL,
3659     expirationDate              TIMESTAMP,
3660
3661 --ClassificationNode attributes
3662     parent                        UUID,
3663     path                          VARCHAR(512) NOT NULL,
3664     code                          ShortName
3665 );
3666
3667 CREATE PROCEDURE ClassificationNode_classifiedObjects(classificationNodeId) {
3668 --Must return a collection of UUIDs for RegistryEntries classified by this ClassificationNode
3669 }
3670
3671

```

```

3672 --Begin Registry Audit Trail tables
3673
3674 CREATE TABLE AuditableEvent (
3675 --RegistryObject Attributes
3676     id                                UUID PRIMARY KEY NOT NULL,
3677     name                              LongName,
3678     description                       FreeFormText,
3679     accessControlPolicy               UUID NOT NULL,
3680
3681 --AuditableEvent attributes
3682     user                              UUID,
3683     eventType                         INT DEFAULT 0 NOT NULL,
3684     registryEntry                    UUID NOT NULL,
3685     timestamp                         TIMESTAMP NOT NULL,
3686 );
3687
3688
3689
3690 CREATE TABLE User (
3691 --RegistryObject Attributes
3692     id                                UUID PRIMARY KEY NOT NULL,
3693     name                              LongName,
3694     description                       FreeFormText,
3695     accessControlPolicy               UUID NOT NULL,
3696
3697 --User attributes
3698     organization                      UUID NOT NULL
3699
3700 --address attributes flattened
3701     address_city                     ShortName,
3702     address_country                  ShortName,
3703     address_postalCode               ShortName,
3704     address_state                    ShortName,
3705     address_street                   ShortName,
3706
3707     email                            ShortName,
3708
3709 --fax attribute flattened
3710     fax_areaCode                     VARCHAR(4) NOT NULL,
3711     fax_countryCode                  VARCHAR(4),
3712     fax_extension                     VARCHAR(8),
3713     fax_umber                        VARCHAR(8) NOT NULL,
3714     fax_url                           URI
3715
3716 --mobilePhone attribute flattened
3717     mobilePhone_areaCode             VARCHAR(4) NOT NULL,
3718     mobilePhone_countryCode          VARCHAR(4),
3719     mobilePhone_extension            VARCHAR(8),
3720     mobilePhone_umber                VARCHAR(8) NOT NULL,
3721     mobilePhone_url                  URI
3722
3723 --name attribute flattened
3724     name_firstName                   ShortName,
3725     name_middleName                  ShortName,
3726     name_lastName                    ShortName,
3727
3728 --pager attribute flattened
3729     pager_areaCode                   VARCHAR(4) NOT NULL,
3730     pager_countryCode                VARCHAR(4),
3731     pager_extension                   VARCHAR(8),
3732     pager_umber                       VARCHAR(8) NOT NULL,
3733     pager_url                         URI
3734
3735 --telephone attribute flattened
3736     telephone_areaCode               VARCHAR(4) NOT NULL,
3737     telephone_countryCode            VARCHAR(4),
3738     telephone_extension               VARCHAR(8),
3739     telephone_umber                  VARCHAR(8) NOT NULL,
3740     telephone_url                    URI,
3741

```

```

3742     url                                     URI,
3743
3744 );
3745
3746 CREATE TABLE Organization (
3747 --RegistryObject Attributes
3748     id                                     UUID PRIMARY KEY NOT NULL,
3749     name                                   LongName,
3750     description                             FreeFormText,
3751     accessControlPolicy                     UUID NOT NULL,
3752
3753 --Versionable attributes
3754     majorVersion                           INT DEFAULT 0 NOT NULL,
3755     minorVersion                           INT DEFAULT 1 NOT NULL,
3756
3757 --RegistryEntry attributes
3758     status                                  INT DEFAULT 0 NOT NULL,
3759     userVersion                             ShortName,
3760     stability                               INT     DEFAULT 0 NOT NULL,
3761     expirationDate                         TIMESTAMP,
3762
3763 --Organization attributes
3764
3765 --Organization.address attribute flattened
3766     address_city                           ShortName,
3767     address_country                         ShortName,
3768     address_postalCode                     ShortName,
3769     address_state                           ShortName,
3770     address_street                         ShortName,
3771
3772 --primary contact for Organization, points to a User.
3773 --Note many Users may belong to the same Organization
3774     contact                                 UUID NOT NULL,
3775
3776 --Organization.fax attribute falttened
3777     fax_areaCode                           VARCHAR(4) NOT NULL,
3778     fax_countryCode                        VARCHAR(4),
3779     fax_extension                           VARCHAR(8),
3780     fax_umber                              VARCHAR(8) NOT NULL,
3781     fax_url                                 URI,
3782
3783 --Organization.parent attribute
3784     parent                                  UUID,
3785
3786 --Organization.telephone attribute falttened
3787     telephone_areaCode                     VARCHAR(4) NOT NULL,
3788     telephone_countryCode                  VARCHAR(4),
3789     telephone_extension                     VARCHAR(8),
3790     telephone_umber                        VARCHAR(8) NOT NULL,
3791     telephone_url                           URI
3792 );
3793
3794
3795 --Note that the ebRIM security view is not visible through the public query mechanism
3796 --in the current release
3797
3798
3799 --The RegistryEntry View allows polymorphic queries over all ebRIM classes derived
3800 --from RegistryEntry
3801
3802 CREATE VIEW RegistryEntry (
3803 --RegistryObject Attributes
3804     id,
3805     name,
3806     description,
3807     accessControlPolicy,
3808
3809 --Versionable attributes
3810     majorVersion,
3811     minorVersion,

```

```

3812
3813 --RegistryEntry attributes
3814     status,
3815     userVersion,
3816     stability,
3817     expirationDate
3818
3819 ) AS
3820 SELECT
3821 --RegistryObject Attributes
3822     id,
3823     name,
3824     description,
3825     accessControlPolicy,
3826
3827 --Versionable attributes
3828     majorVersion,
3829     minorVersion,
3830
3831 --RegistryEntry attributes
3832     status,
3833     userVersion,
3834     stability,
3835     expirationDate
3836
3837 FROM ExtrinsicObject
3838 UNION
3839
3840 SELECT
3841 --RegistryObject Attributes
3842     id,
3843     name,
3844     description,
3845     accessControlPolicy,
3846
3847 --Versionable attributes
3848     majorVersion,
3849     minorVersion,
3850
3851 --RegistryEntry attributes
3852     status,
3853     userVersion,
3854     stability,
3855     expirationDate
3856 FROM (Registry)Package
3857 UNION
3858
3859 SELECT
3860 --RegistryObject Attributes
3861     id,
3862     name,
3863     description,
3864     accessControlPolicy,
3865
3866 --Versionable attributes
3867     majorVersion,
3868     minorVersion,
3869
3870 --RegistryEntry attributes
3871     status,
3872     userVersion,
3873     stability,
3874     expirationDate
3875 FROM ClassificationNode;

```

3876

3877 **Appendix D Non-normative Content Based Ad Hoc Queries**

3878 The Registry SQL query capability supports the ability to search for content based not
3879 only on metadata that catalogs the content but also the data contained within the
3880 content itself. For example it is possible for a client to submit a query that searches for
3881 all Collaboration Party Profiles that define a role named "seller" within a RoleName
3882 element in the CPP document itself. Currently content-based query capability is
3883 restricted to XML content.

3884 **D.1.1 Automatic Classification of XML Content**

3885 Content-based queries are indirectly supported through the existing classification
3886 mechanism supported by the Registry.

3887 A submitting organization may define logical indexes on any XML schema or DTD when
3888 it is submitted. An instance of such a logical index defines a link between a specific
3889 attribute or element node in an XML document tree and a ClassificationNode in a
3890 classification scheme within the registry.

3891 The registry utilizes this index to automatically classify documents that are instances of
3892 the schema at the time the document instance is submitted. Such documents are
3893 classified according to the data contained within the document itself.

3894 Such automatically classified content may subsequently be discovered by clients using
3895 the existing classification-based discovery mechanism of the Registry and the query
3896 facilities of the ObjectQueryManager.

3897 [Note] This approach is conceptually similar to the way databases support
3898 indexed retrieval. DBAs define indexes on tables in the schema. When
3899 data is added to the table, the data gets automatically indexed.

3900 **D.1.2 Index Definition**

3901 This section describes how the logical indexes are defined in the SubmittedObject
3902 element defined in the Registry DTD. The complete Registry DTD is specified in
3903 Appendix A.

3904 A SubmittedObject element for a schema or DTD may define a collection of
3905 ClassificationIndexes in a ClassificationIndexList optional element. The
3906 ClassificationIndexList is ignored if the content being submitted is not of the SCHEMA
3907 objectType.

3908 The ClassificationIndex element inherits the attributes of the base class RegistryObject
3909 in [ebRIM]. It then defines specialized attributes as follows:

- 3910 1. classificationNode: This attribute references a specific ClassificationNode by its
3911 ID.

- 3912 2. contentIdentifier: This attribute identifies a specific data element within the
3913 document instances of the schema using an XPATH expression as defined by
3914 [XPT].

3915 **D.1.3 Example Of Index Definition**

3916 To define an index that automatically classifies a CPP based upon the roles defined
3917 within its RoleName elements, the following index must be defined on the CPP schema
3918 or DTD:

```
3919 <ClassificationIndex  
3920     classificationNode='id-for-role-classification-scheme'  
3921     contentIdentifier='/Role//RoleName'  
3922 />
```

3923 **D.1.4 Proposed XML Definition**

```
3924 <!--  
3925 A ClassificationIndexList is specified on ExtrinsicObjects of objectType  
3926 'Schema' to define an automatic Classification of instance objects of the  
3927 schema using the specified classificationNode as parent and a  
3928 ClassificationNode created or selected by the object content as selected by  
3929 the contentIdentifier  
3930 -->  
3931 <!ELEMENT ClassificationIndex EMPTY>  
3932 <!ATTLIST ClassificationIndex  
3933     %ObjectAttributes;  
3934     classificationNode IDREF #REQUIRED  
3935     contentIdentifier CDATA #REQUIRED  
3936 >  
3937  
3938 <!-- ClassificationIndexList contains new ClassificationIndexes -->  
3939 <!ELEMENT ClassificationIndexList (ClassificationIndex)*>
```

3940 **D.1.5 Example of Automatic Classification**

3941 Assume that a CPP is submitted that defines two roles as “seller” and “buyer.” When the
3942 CPP is submitted it will automatically be classified by two ClassificationNodes named
3943 “buyer” and “seller” that are both children of the ClassificationNode (e.g. a node named
3944 Role) specified in the classificationNode attribute of the ClassificationIndex. Note that if
3945 either of the two ClassificationNodes named “buyer” and “seller” did not previously exist,
3946 the ObjectManager would automatically create these ClassificationNodes.

3947 **Appendix E Security Implementation Guideline**

3948 This section provides a suggested blueprint for how security processing may be
3949 implemented in the Registry. It is meant to be illustrative not prescriptive. Registries
3950 may choose to have different implementations as long as they support the default
3951 security roles and authorization rules described in this document.

3952 **E.1 Authentication**

- 3953 1. As soon as a message is received, the first work is the authentication. A principal
3954 object is created.
- 3955 2. If the message is signed, it is verified (including the validity of the certificate) and the
3956 DN of the certificate becomes the identity of the principal. Then the Registry is
3957 searched for the principal and if found, the roles and groups are filled in.
- 3958 3. If the message is not signed, an empty principal is created with the role
3959 RegistryGuest. This step is for symmetry and to decouple the rest of the processing.
- 3960 4. Then the message is processed for the command and the objects it will act on.

3961 **E.2 Authorization**

3962 For every object, the access controller will iterate through all the AccessControlPolicy
3963 objects with the object and see if there is a chain through the permission objects to
3964 verify that the requested method is permitted for the Principal. If any of the permission
3965 objects which the object is associated with has a common role, or identity, or group with
3966 the principal, the action is permitted.

3967 **E.3 Registry Bootstrap**

3968 When a Registry is newly created, a default Principal object should be created with the
3969 identity of the Registry Admin's certificate DN with a role RegistryAdmin. This way, any
3970 message signed by the Registry Admin will get all the privileges.

3971 When a Registry is newly created, a singleton instance of AccessControlPolicy is
3972 created as the default AccessControlPolicy. This includes the creation of the necessary
3973 Permission instances as well as the Privileges and Privilege attributes.

3974 **E.4 Content Submission – Client Responsibility**

3975 The Registry client has to sign the contents before submission – otherwise the content
3976 will be rejected.

3977 **E.5 Content Submission – Registry Responsibility**

- 3978 1. Like any other request, the client will be first authenticated. In this case, the Principal
3979 object will get the DN from the certificate.
- 3980 2. As per the request in the message, the RegistryEntry will be created.
- 3981 3. The RegistryEntry is assigned the singleton default AccessControlPolicy.

- 3982 4. If a principal with the identity of the SO is not available, an identity object with the
3983 SO's DN is created
- 3984 5. A principal with this identity is created

3985 **E.6 Content Delete/Deprecate – Client Responsibility**

3986 The Registry client has to sign the payload (not entire message) before submission, for
3987 authentication purposes; otherwise, the request will be rejected

3988 **E.7 Content Delete/Deprecate – Registry Responsibility**

- 3989 1. Like any other request, the client will be first authenticated. In this case, the Principal
3990 object will get the DN from the certificate. As there will be a principal with this identity
3991 in the Registry, the Principal object will get all the roles from that object
- 3992 2. As per the request in the message (delete or deprecate), the appropriate method in
3993 the RegistryObject class will be accessed.
- 3994 3. The access controller performs the authorization by iterating through the Permission
3995 objects associated with this object via the singleton default AccessControlPolicy.
- 3996 4. If authorization succeeds then the action will be permitted. Otherwise an error
3997 response is sent back with a suitable AuthorizationException error message.

3998 **Appendix F Native Language Support (NLS)**

3999 **F.1 Definitions**

4000 Although this section discusses only character set and language, the following terms
4001 have to be defined clearly.
4002

4003 **F.1.1 Coded Character Set (CCS):**

4004 CCS is a mapping from a set of abstract characters to a set of integers. [RFC 2130].
4005 Examples of CCS are ISO-10646, US-ASCII, ISO-8859-1, and so on.
4006

4007 **F.1.2 Character Encoding Scheme (CES):**

4008 CES is a mapping from a CCS (or several) to a set of octets. [RFC 2130]. Examples of
4009 CES are ISO-2022, UTF-8.

4010 **F.1.3 Character Set (charset):**

4011 charset is a set of rules for mapping from a sequence of octets to a sequence of
4012 characters.[RFC 2277],[RFC 2278]. Examples of character set are ISO-2022-JP, EUC-
4013 KR.

4014
4015 A list of registered character sets can be found at [IANA].

4016 **F.2 NLS And Request / Response Messages**

4017 For the accurate processing of data in both registry client and registry services, it is
4018 essential to know which character set is used. Although the body part of the transaction
4019 may contain the charset in xml encoding declaration, registry client and registry services
4020 shall specify charset parameter in MIME header when they use text/xml. Because as
4021 defined in [RFC 3023], if a text/xml entity is received with the charset parameter
4022 omitted, MIME processors and XML processors MUST use the default charset value of
4023 "us-ascii".

4024
4025 Ex. Content-Type: text/xml; charset=ISO-2022-JP

4026
4027 Also, when an application/xml entity is used, the charset parameter is optional, and
4028 registry client and registry services must follow the requirements in Section 4.3.3 of
4029 [REC-XML] which directly address this contingency.

4030
4031 If another Content-Type is chosen to be used, usage of charset must follow [RFC 3023].

4032 **F.3 NLS And Storing of RegistryEntry**

4033 This section provides NLS guidelines on how a registry should store **RegistryEntry**
4034 instances.

4035 **F.3.1 Character Set of RegistryEntry**

4036 This is basically an implementation issue because the actual character set that the
4037 **RegistryEntry** is stored with, does not affect the interface. However, it is highly
4038 recommended to use UTF-16 or UTF-8 for covering various languages.

4039 **F.3.2 Language Information of RegistryEntry**

4040 The language may be specified in xml:lang attribute (Section 2.12 [REC-XML]). If the
4041 xml:lang attribute is specified, then the registry may use that language code as the
4042 value of a special Slot with name **language** and slotType of **nls** in the **RegistryEntry**.
4043 The value must be compliant to [RFC 1766]. Slots are defined in [ebRIM].

4044 **F.4 NLS And Storing of Repository Items**

4045 This section provides NLS guidelines on how a registry should store repository items.

4046 **F.4.1 Character Set of Repository Items**

4047 Unlike the character set of *RegistryEntry*, the charset of a repository item must be
 4048 preserved as it is originally specified in the transaction. The registry may use a special
 4049 Slot with name *repositoryItemCharset*, and sloType of *nls* for the *RegistryEntry* for
 4050 storing the charset of the corresponding repository item. Value must be the one defined
 4051 in [RFC 2277], [RFC 2278]. The *repositoryItemCharset* is optional because not all
 4052 repository items require it.

4053 **F.4.2 Language information of repository item**

4054 Specifying only character set is not enough to tell which language is used in the
 4055 repository item. A registry may use a special Slot with name *repositoryItemLang*, and
 4056 sloType of *nls* to store that information. This attribute is optional because not all
 4057 repository items require it. Value must be compliant to [RFC 1766]

4058
 4059 This document currently specifies only the method of sending the information of
 4060 character set and language, and how it is stored in a registry. However, the language
 4061 information may be used as one of the query criteria, such as retrieving only DTD
 4062 written in French. Furthermore, a language negotiation procedure, like registry client is
 4063 asking a favorite language for messages from registry services, could be another
 4064 functionality for the future revision of this document.

4065 **Appendix G Terminology Mapping**

4066 While every attempt has been made to use the same terminology used in other works
 4067 there are some terminology differences.

4068 The following table shows the terminology mapping between this specification and that
 4069 used in other specifications and working groups.

4070

This Document	OASIS	ISO 11179
“repository item”	RegisteredObject	
RegistryEntry	RegistryEntry	Administered Component
ExternalLink	RelatedData	N/A
Object.id	regEntryId, orgId, etc.	
ExtrinsicObject.uri	objectURL	
ExtrinsicObject.objectType	defnSource, objectType	

RegistryEntry.name	commonName	
Object.description	shortDescription, Description	
ExtrinsicObject.mimeType	objectType="mime" fileType="<mime type>"	
Versionable.majorVersion	userVersion only	
Versionable.minorVersion	userVersion only	
RegistryEntry.status	registrationStatus	

4071

Table 1: Terminology Mapping Table

4072

4072 **References**

- 4073 [Bra97] Keywords for use in RFCs to Indicate Requirement Levels.
- 4074 [GLS] ebXML Glossary, http://www.ebxml.org/documents/199909/terms_of_reference.htm
- 4075 [TA] ebXML Technical Architecture
- 4076 http://www.ebxml.org/specdrafts/ebXML_TA_v1.0.pdf
- 4077 [OAS] OASIS Information Model
- 4078 <http://www.nist.gov/itl/div897/ctg/regrep/oasis-work.html>
- 4079 [ISO] ISO 11179 Information Model
- 4080 <http://208.226.167.205/SC32/jtc1sc32.nsf/576871ad2f11bba785256621005419d7/b83fc7816a6064c68525690e0065f913?OpenDocument>
- 4081
- 4082 [ebRIM] ebXML Registry Information Model
- 4083 http://www.ebxml.org/project_teams/registry/private/registryInfoModelv0.54.pdf
- 4084 [ebBPM] ebXML Business Process Specification Schema
- 4085 <http://www.ebxml.org/specdrafts/Busv2-0.pdf>
- 4086 [ebCPP] ebXML Collaboration-Protocol Profile and Agreement Specification
- 4087 http://www.ebxml.org/project_teams/trade_partner/private/
- 4088 [ebXML-UDDI] Using UDDI to Find ebXML Reg/Reps
- 4089 <http://lists.ebxml.org/archives/ebxml-regrep/200104/msg00104.html>
- 4090 [CTB] Context table informal document from Core Components
- 4091 [ebMS] ebXML Messaging Service Specification, Version 0.21
- 4092 http://ebxml.org/project_teams/transport/private/ebXML_Messaging_Service_Specification_v0-21.pdf
- 4093 [ERR] ebXML TRP Error Handling Specification
- 4094 http://www.ebxml.org/project_teams/transport/ebXML_Message_Service_Specification_v-0.8_001110.pdf
- 4095 [SEC] ebXML Risk Assessment Technical Report, Version 3.6
- 4096 <http://lists.ebxml.org/archives/ebxml-ta-security/200012/msg00072.html>
- 4097 [XPT] XML Path Language (XPath) Version 1.0
- 4098 <http://www.w3.org/TR/xpath>
- 4099 [SQL] Structured Query Language (FIPS PUB 127-2)
- 4100 <http://www.itl.nist.gov/fipspubs/fip127-2.htm>
- 4101
- 4102 [SQL/PSM] Database Language SQL — Part 4: Persistent Stored Modules
- 4103 (SQL/PSM) [ISO/IEC 9075-4:1996]

- 4104
4105 [IANA] IANA (Internet Assigned Numbers Authority).
4106 Official Names for Character Sets, ed. Keld Simonsen et al.
4107 <ftp://ftp.isi.edu/in-notes/iana/assignments/character-sets>
4108
4109 [RFC 1766] IETF (Internet Engineering Task Force). RFC 1766:
4110 Tags for the Identification of Languages, ed. H. Alvestrand. 1995.
4111 <http://www.cis.ohio-state.edu/htbin/rfc/rfc1766.html>
4112
4113 [RFC 2277] IETF (Internet Engineering Task Force). RFC 2277:
4114 IETF policy on character sets and languages, ed. H. Alvestrand. 1998.
4115 <http://www.cis.ohio-state.edu/htbin/rfc/rfc2277.html>
4116
4117 [RFC 2278] IETF (Internet Engineering Task Force). RFC 2278:
4118 IANA Charset Registration Procedures, ed. N. Freed and J. Postel. 1998.
4119 <http://www.cis.ohio-state.edu/htbin/rfc/rfc2278.html>
4120
4121 [RFC 3023] IETF (Internet Engineering Task Force). RFC 3023:
4122 XML Media Types, ed. M. Murata. 2001.
4123 <ftp://ftp.isi.edu/in-notes/rfc3023.txt>
4124
4125 [REC-XML] W3C Recommendation. Extensible Markup language(XML)1.0(Second
4126 Edition)
4127 <http://www.w3.org/TR/REC-xml>
4128
4129 [UUID] DCE 128 bit Universal Unique Identifier
4130 http://www.opengroup.org/onlinepubs/009629399/apdx.htm#tagcjh_20
4131 <http://www.opengroup.org/publications/catalog/c706.htm><http://www.w3.org/TR/REC-xml>

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