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181

Foreword

182 The *Indications Profile* (DSP1054) was prepared by the DMTF WBEM Infrastructure Modeling Working
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184 DMTF is a not-for-profit association of industry members dedicated to promoting enterprise and systems
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196 Group.

197

Introduction

198 The information in this specification should be sufficient for a provider or consumer of this data to
199 unambiguously identify the classes, properties, methods, and values that shall be instantiated to
200 subscribe, advertise, produce, or consume an indication using the DMTF Common Information Model
201 (CIM) Schema.

202 The target audience for this specification is implementers who are writing CIM-based providers or
203 consumers of management interfaces that represent the components described in this document.

204

Indications Profile

205 1 Scope

206 The *Indications Profile* defines the CIM elements that are used to subscribe for indications of unsolicited
207 events and a server-side implementation uses to advertise the possible indications, as well as the content
208 of an indication used to report events in a managed system.

209 2 Normative References

210 The following referenced documents are indispensable for the application of this document. For dated
211 references, only the edition cited applies. For undated references, the latest edition of the referenced
212 document (including any amendments) applies.

213 2.1 Approved References

214 DMTF DSP0004, *CIM Infrastructure Specification 2.5*,
215 http://www.dmtf.org/standards/published_documents/DSP0004_2.5.pdf

216 DMTF DSP0200, *CIM Operations over HTTP 1.3*,
217 http://www.dmtf.org/standards/published_documents/DSP0200_1.3.pdf

218 DMTF DSP0207, *WBEM URI Mapping 1.0*,
219 http://www.dmtf.org/standards/published_documents/DSP0207_1.0.pdf

220 DMTF DSP1001, *Management Profile Specification Usage Guide 1.0*,
221 http://www.dmtf.org/standards/published_documents/DSP1001_1.0.pdf

222 DMTF DSP1033, *Profile Registration Profile 1.0*,
223 http://www.dmtf.org/standards/published_documents/DSP1033_1.0.pdf

224 IETF RFC3986, Uniform Resource Identifier (URI): Generic Syntax, Jan. 2005,
225 <http://www.ietf.org/rfc/rfc3986.txt>

226 2.2 Other References

227 ISO/IEC Directives, Part 2, *Rules for the structure and drafting of International Standards*,
228 <http://isotc.iso.org/livelink/livelink.exe?func=ll&objId=4230456&objAction=browse&sort=subtype>

229 3 Terms and Definitions

230 For the purposes of this document, the following terms and definitions apply. For the purposes of this
231 document, the terms and definitions given in [DSP1033](#) and [DSP1001](#) also apply.

232 3.1

233 can

234 used for statements of possibility and capability, whether material, physical, or causal

- 235 **3.2**
236 **cannot**
237 used for statements of possibility and capability, whether material, physical, or causal
- 238 **3.3**
239 **conditional**
240 indicates requirements to be followed strictly to conform to the document when the specified conditions
241 are met
- 242 **3.4**
243 **mandatory**
244 indicates requirements to be followed strictly to conform to the document and from which no deviation is
245 permitted
- 246 **3.5**
247 **may**
248 indicates a course of action permissible within the limits of the document
- 249 **3.6**
250 **need not**
251 indicates a course of action permissible within the limits of the document
- 252 **3.7**
253 **optional**
254 indicates a course of action permissible within the limits of the document
- 255 **3.8**
256 **referencing profile**
257 indicates a profile that owns the definition of this class and can include a reference to this profile in its
258 "Related Profiles" table
- 259 **3.9**
260 **shall**
261 indicates requirements to be followed strictly to conform to the document and from which no deviation is
262 permitted
- 263 **3.10**
264 **shall not**
265 indicates requirements to be followed strictly in order to conform to the document and from which no
266 deviation is permitted
- 267 **3.11**
268 **should**
269 indicates that among several possibilities, one is recommended as particularly suitable, without
270 mentioning or excluding others, or that a certain course of action is preferred but not necessarily required
- 271 **3.12**
272 **should not**
273 indicates that a certain possibility or course of action is deprecated but not prohibited

- 274 **3.13**
275 **bulk subscription**
276 an indication subscription to a filter collection that includes more than one indication filter
- 277 **3.14**
278 **CIM element**
279 CIM classes (including associations), properties (including references), methods, or indications
280 NOTE: For the purpose of this document, CIM qualifiers and schemas are not considered CIM elements.
- 281 **3.15**
282 **deprecated**
283 indicates that an element or profile behavior has been outdated by newer constructs
284 NOTE: Deprecated elements may become obsolete in future versions of the profile. Authors should avoid using
285 deprecated elements and attributes. Server implementations should continue to support deprecated elements for
286 backward compatibility.
- 287 **3.16**
288 **dynamic filter**
289 an instance of CIM_IndicationFilter that is created by a client application at runtime
290 These instances may come and go depending on the client application.
- 291 **3.17**
292 **event**
293 the occurrence of a phenomenon of interest to a management application
294 Events are not published in CIM directly but may be represented by a model change or the instantiation of
295 a CIM_Indication subclass.
- 296 **3.18**
297 **indication**
298 the communication and record of the detection of an event of interest
299 The indication may only represent an aspect of the event and not the entire event. Multiple indications
300 may be communicated for a specific event.
- 301 **3.19**
302 **indication filter**
303 a logical construct that specifies a filter on indications, used to control whether indications are delivered to
304 a subscriber
- 305 **3.20**
306 **match**
307 (CIM property values) indicates that a property is equal to one or more values
- 308 **3.21**
309 **obsolete**
310 indicates that an item was defined in prior standards but has been removed from this standard
- 311 **3.22**
312 **organization**
313 consortium, standards group, or company creating a DMTF profile specification

- 314 **3.23**
315 **pattern**
316 (CIM property values) supplied pattern that the value of a property shall follow
- 317 **3.24**
318 **query**
319 a filter to constrain the events for which indications are generated
- 320 **3.25**
321 **static filter**
322 an instance of CIM_IndicationFilter that is created by a profile implementation at load time
323 These instances usually do not change.
- 324 **3.26**
325 **subscribe**
326 the mechanism whereby a client registers for delivery of indications
- 327 **3.27**
328 **WBEM Server**
329 a Web Based Enterprise Management (WBEM) implementation that provides Web-based management
330 functionality that conforms to a set of management and Internet standard technologies developed to unify
331 the management of distributed computing environments

332 **4 Abbreviated Terms and Document Conventions**

333 **4.1 Abbreviated Terms**

334 The following abbreviations are used in this document.

335 **4.1.1**

336 **CQL**

337 CIM Query Language

338 **4.1.2**

339 **QoS**

340 Quality of service

341 **4.1.3**

342 **URI**

343 Uniform Resource Identifier

344 **4.1.4**

345 **WBEM**

346 Web Based Enterprise Management

347 **4.2 Document Conventions**

348 **4.2.1 Typographical Conventions**

349 **Experimental Material**

350 Some of the content considered for inclusion in this specification has yet to receive sufficient review to
351 satisfy the adoption requirements set forth by the DMTF. This content is included in this specification as
352 an aid to implementers who are interested in likely future developments. The content marked as
353 experimental may change as implementation experience is gained. It is likely that the content will be
354 included in an upcoming revision of the specification. Until that time, the content is purely informational
355 and therefore it is clearly labeled as "Experimental" within the text.

356 The following typographical convention indicates experimental content:

357 **EXPERIMENTAL**

358 Experimental content appears here.

359 **EXPERIMENTAL**

360 In tables or figures where the typographical convention cannot be used, the "Experimental" label is used
361 alone.

362 **5 Synopsis**

363 **Profile name:** Indications

364 **Version:** 1.0.1

365 **Organization:** DMTF

366 **CIM Schema Version:** 2.22

367 **Central Class:** CIM_IndicationService

368 **Scoping Class:** CIM_System

369 The *Indications Profile* extends the management capability of the referencing profiles by adding the
 370 capability to subscribe for indications of unsolicited events. It enables a server-side implementation to
 371 advertise the possible indications. The *Indications Profile* defines the content of indications from
 372 autonomous and component profiles implemented by CIM-based management instrumentation.

373 The Central Instance of this profile shall be an instance of CIM_IndicationService. The Scoping Instance
 374 shall be the instance of CIM_System with which the Central Instance is associated through
 375 CIM_HostedService.

376 Table 1 identifies profiles on which this profile has a dependency.

377 **Table 1 – Related Profiles**

Profile Name	Organization	Version	Relationship	Behavior
Profile Registration	DMTF	1.0	Mandatory	See 10.19.

378 **6 Description**

379 The *Indications Profile* describes the necessary properties and methods to describe the indications
 380 supported by managed elements and how a client subscribes to those indications.

381 **6.1 Overview of Profile Elements**

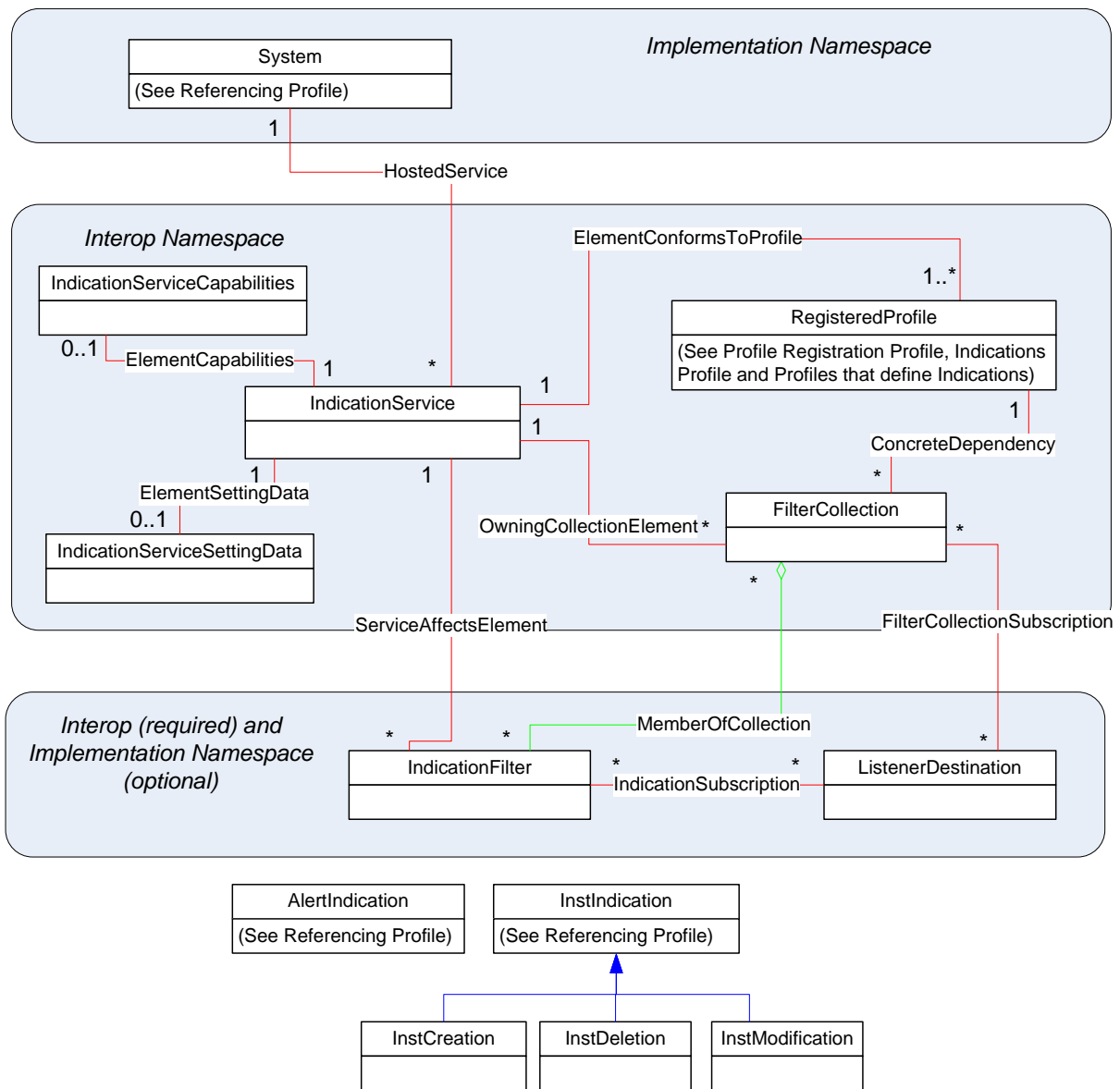
382 An event is some phenomenon of interest. An indication is an observation of characteristics of that event.
 383 For example, an event could be the fact that your house caught fire. An indication could report the fact
 384 that smoke or heat is observed; these are, as the observer knows, the consequence of the fire.
 385 Alternatively, the indication may report that your house has caught fire.

386 Since CIM report many characteristics of management elements in several classes and an event is likely
 387 to change several instances and properties, a change to any instance reports some of the characteristics
 388 of the event. As such, any given life cycle indication reports observations.

389 AlertIndications instances are capable to reporting the event directly whether or not any characteristics of
 390 the event are modeled by an implementation. As such, an AlertIndication can report the event directly, but
 391 may not be able to convey any observations of the effect of the event.

392 Figure 1 represents the UML class diagram for the *Indications Profile*. For better clarity and
 393 understanding, see [DSP1033](#) for information about profile registration and namespaces.

394 For simplicity, the *CIM_* prefix has been removed from the names of the classes in Figure 1.



395

396

Figure 1 – Indications Profile: Class Diagram

397 CIM_IndicationFilter, CIM_FilterCollection, and CIM_ListenerDestination are instantiated in the Interop
 398 namespace. Creating the CIM_IndicationFilter, CIM_FilterCollection, and CIM_ListenerDestination
 399 instances in the Interop namespace (see [DSP1033](#)) makes it easier for clients to discover filters,
 400 collections of filters, and existing listener destinations that have been instantiated or are available.

401 CIM_IndicationService represents the ability of the server-side implementation to support the delivery of
 402 indications. If the *Indications Profile* is implemented, there shall be at least one instance of
 403 CIM_IndicationService.

404 CIM_IndicationServiceCapabilities is an optional element that represents the capabilities of the
 405 CIM_IndicationService.

406 CIM_IndicationServiceSettingData is an optional element that is used to model the initial configuration of
407 the CIM_IndicationService.

408 A CIM_IndicationFilter instance represents the potential of an implementation to produce an indication as
409 described by the filter's query. The filter's query logically selects a particular modeled change, such as the
410 creation of a CIM_AlertIndication or the change to the existing instance, amongst a population of all such
411 changes. It appears to an observer that the implementation is monitoring all changes all the time.
412 CIM_IndicationFilters may be created by either the implementation (static filters) or the management
413 client (dynamic filters) (see 6.3).

414 CIM_FilterCollection is used to describe a collection of filters supported in the context of a given profile
415 (see 6.4).

416 CIM_ListenerDestination represents the location and method of delivering an indication to the client that
417 may be subscribed to one or more indication filters. The Destination address in the
418 CIM_ListenerDestination may be different that the network address of the client that created the
419 subscription.

420 CIM_IndicationSubscription represents the request that indications described by IndicationFilter or
421 inferred by IndicationFilterCollection are delivered to a particular ListenerDestination.

422 CIM_FilterCollectionSubscription represents an active subscription of a destination (represented by
423 CIM_ListenerDestination) to a collection of indication filters (represented by CIM_FilterCollection).

424 CIM_ConcreteDependency is used to scope instances of CIM_FilterCollection with instances of
425 CIM_RegisteredProfile that identify the profile that provides context to the indication filters.

426 CIM_MemberOfCollection may be used to aggregate instances of CIM_IndicationFilter into one or more
427 instances of CIM_FilterCollection.

428 CIM_OwningCollectionElement is used to scope instances of CIM_FilterCollection to the instance of
429 CIM_IndicationService.

430 **6.2 Client Indication Subscriptions**

431 Using the behavior defined in the *Indications Profile*, client applications are able to receive indications
432 from managed elements by subscribing to one or more indication filters (which define query strings that
433 select specific instances of subclasses of CIM_Indication).

434 **6.2.1 Creating a Subscription**

435 A client implements three steps to subscribe for indications:

- 436 1. Determine if there is an existing indication filter for the subscription. The indication filter may be
437 explicitly modeled with an instance of CIM_IndicationFilter or implicitly represented by a
438 CIM_FilterCollection that is defined to contain the indication filter. If an appropriate indication filter
439 does not exist, and dynamic filters are supported, the client can create a dynamic filter.
- 440 2. Determine if the desired destination is already covered by looking for an instance of
441 CIM_ListenerDestination that represents the destination. If one does not exist, the client may
442 create one.
- 443 3. Create an instance of CIM_IndicationSubscription or CIM_FilterCollectionSubscription between
444 the CIM_ListenerDestination and CIM_IndicationFilter or CIM_FilterCollection.

445 **6.2.2 Bulk Subscriptions**

446 A bulk subscription is a single subscription that encompasses one or more indication filters. Bulk
447 subscriptions are implemented as an instance of CIM_FilterCollectionSubscription that associates an

448 instance of CIM_ListenerDestination to an instance of CIM_FilterCollection. Subscribing to a filter
449 collection is equivalent to individually subscribing to each indication filter in the collection and results in an
450 indication being sent for every indication filter triggered by an event.

451 **6.2.3 Recursive Subscriptions**

452 An instance of CIM_FilterCollection implicitly contains indication filters that may be represented explicitly
453 by instances of CIM_IndicationFilter. An instance of CIM_FilterCollection may contain additional
454 CIM_FilterCollection instances. Subscription to a CIM_FilterCollection instance is interpreted as a single
455 subscription to all contained indication filters and all contained instances of CIM_FilterCollection. Thus, if
456 the same destination is explicitly subscribed to an instance of CIM_FilterCollection and is also explicitly
457 subscribed to a contained instance of CIM_IndicationFilter or CIM_FilterCollection, the destination can
458 receive duplicate notifications.

459 **6.2.4 Subscriptions whose Filter Semantics Overlap**

460 The same indication destination may be represented with more than one instance of
461 CIM_ListenerDestination. The filter semantics between two subscriptions may overlap. The same indication
462 filter may be represented multiple times. It may be represented explicitly by more than one instance of
463 CIM_IndicationFilter or implicitly by one or more CIM_FilterCollection instances. This potential overlap
464 makes it possible for more than one subscription to cause a particular indication to be delivered to a
465 particular destination. The server-side implementation does not perform any crosschecking to prevent the
466 delivery of overlapping indications. Therefore, it is the responsibility of a client to ensure that the
467 subscriptions they create does not result in overlapping filters for the same destination. It is the
468 responsibility where the same indication can be produced from multiple indication filters.

469 **6.2.5 Dynamic Contents of Filter Collections**

470 A subscription to a CIM_FilterCollection instance is interpreted as a subscription to the filters contained
471 within the collection. Although the indication filters implicitly contained in the collection do not change, it is
472 possible that the indication filters explicitly contained (CIM_IndicationFilter or nested CIM_FilterCollection
473 instances) may change. A snapshot of the contained filters at the time of the creation of the subscription
474 is not maintained. Therefore, as the contents of the CIM_FilterCollection instance change, the set of filters
475 to which the subscription actually applies may change.

476 **6.3 Indication Filters**

477 The class CIM_IndicationFilter represents a filter for selecting indications and contains a query string that
478 defines selection criteria for events. Indication filters are used to identify the events created by managed
479 elements and delivered by the server-side implementation to the client. Filters can be created by either
480 the implementation (static filters) or by a client (dynamic filters).

481 **6.3.1 Filter Query**

482 Filters identify the type of event to listen for and the CIM elements to be included in the indication
483 delivered to any subscribed clients. Filters are specified in the form of a query string that is contained in
484 the Query property of a CIM_IndicationFilter instance.

485 The query defines the model changes or events that are being listened for. The query may define the
486 model properties sent with the indication. A query also defines the source classes for the properties and
487 what logic is used to combine the instances. A query is defined using the rules of a query language, like
488 CIM Query Language (CQL). Profiles that define indications specify the exact string that represents the
489 filter query.

490 Following are examples of a properly formatted CQL filter query:

491 EXAMPLE 1: “SELECT * FROM CIM_AlertIndication” – This query statement specifies that all supported
492 properties of the CIM_AlertIndication instance can be delivered to clients that have subscribed to this indication
493 when such an event occurs.

494 EXAMPLE 2: “SELECT * FROM CIM_InstCreation WHERE SourceInstance ISA CIM_StorageVolume” – This
495 query statement specifies that all supported properties of the CIM_InstCreation instance can be delivered to
496 clients and the CIM_InstCreation instance shall be delivered when the value of the SourceInstance property is an
497 instance of CIM_StorageVolume.

498 6.3.2 Static Filters

499 Static filters are instances of CIM_IndicationFilter that are instantiated by an implementation. Static filters
500 represent the events for which an implementation is capable of generating indications. These static filters
501 enable a client to discover the supported indications of a given profile.

- 502 • **Mandatory Indication Filter**

503 An indication filter defined in a profile as a mandatory indication filter is required to be supported
504 if at least one indication filter defined in the profile is supported.

- 505 • **Optional Indication Filter**

506 An indication filter defined in a profile as an optional indication filter may be supported.

- 507 • **Conditional Indication Filter**

508 An indication filter defined in a profile as a conditional indication filter is supported if certain
509 conditions are satisfied.

- 510 • **Vendor Defined Indication Filter**

511 An implementation may support instances of CIM_IndicationFilter that are not defined by a
512 profile.

513 6.3.3 Dynamic Filters

514 Dynamic filters are instances of CIM_IndicationFilter that are defined by a management client and
515 maintained by the server-side implementation. Client-defined filters enable a client to receive only the
516 indications of interest. However, dynamic filters depend on the implementation being able to interpret the
517 filter created by the client. Not all implementations, especially footprint-sensitive implementations, can act
518 on the query defined in the filter.

519 While dynamic filters may be supported by an implementation, clients should first look for an existing
520 instance of CIM_IndicationFilter that satisfies a need before attempting to create a dynamic filter. Adding
521 unnecessary additional filters may adversely affect the performance of indication delivery by the
522 implementation.

523 Finally, clients should check the indication service FilterCreationEnabled property value to determine if
524 the implementation supports client-instantiated dynamic filters before attempting the CreateInstance
525 operation to create the filter (see 9.2 for this use case). If the property value is False, the implementation
526 does not support filter creation.

527 6.4 Filter Collections

528 This clause describes filter collections in general and the three specific types of collections.

529 6.4.1 General

530 A filter collection comprises indication filters and other filter collections. Filter collections are represented
531 by instances of CIM_FilterCollection, which is derived from CIM_Collection and inherits the
532 CIM_Collection behavior.

533 A client may subscribe to a filter collection directly. A subscription to a filter collection is recursively a
534 subscription to all of the indication filters defined in the collection and any aggregated filter collections. An
535 indication filter that is contained in a collection need not be explicitly modeled with an instance of
536 CIM_IndicationFilter and associated through an instance of CIM_MemberOfCollection to the
537 CIM_FilterCollection instance for the client to receive indications matching the filter. If a client is
538 subscribed to a filter collection, for a given event the client can receive a discrete indication for each
539 indication filter in the collection the event matches.

540 Profiles may define three types of filter collections: mandatory, conditional/optional, and additional profile
541 specific. Each filter collection can be defined to include one or more indication filters. If an implementation
542 supports at least one indication that satisfies a filter contained in a collection, the collection can be
543 instantiated.

544 Filter collections defined in a profile are associated with the instance of CIM_RegisteredProfile that
545 represents the profile through an instance of CIM_ConcreteDependency. An instance of
546 CIM_FilterCollection is associated with the instance of CIM_IndicationService through an instance of
547 CIM_OwningCollectionElement.

548 The instances of CIM_FilterCollection are associated with zero or more instances of CIM_IndicationFilter
549 by using the CIM_MemberOfCollection association to represent the collection of filters supported in the
550 context of the associated CIM_RegisteredProfile.

551 6.5 When to Instantiate CIM_IndicationFilter

552 To accommodate implementation footprint concerns about the cost of instantiating all of the potential
553 instances of CIM_IndicationFilter, the following approach is available to reduce the number of indication
554 filters instantiated. This approach applies to mandatory and conditional/optional indication definitions in
555 profiles.

556 Because a profile could define filter collections for the mandatory and conditional or optional indications
557 defined in a profile, a client application could subscribe to a collection to receive all of the indications
558 generated by the indication filters that are in that collection. In this case, it is not necessary to explicitly
559 instantiate the instances of the CIM_IndicationFilter that represent each indication filter. This approach
560 allows the actual instantiation of indication filter instances for mandatory and conditional or optional
561 indications to be optional.

562 Following are two reasons to explicitly instantiate instances of CIM_IndicationFilter that represent static
563 filters that are supported:

- 564 • To enable a client application that does not have a priori knowledge of the indication filters
565 specified by a profile to determine the indication filters supported for implementations of the
566 profile
- 567 • To enable a client to subscribe to individual filters instead of all filters in a collection

568 An implementation may instantiate individual instances of CIM_IndicationFilter to satisfy the first goal
569 without supporting individual subscription. The CIM_IndicationFilter.IndividualSubscriptionSupported
570 property indicates whether subscription to the individual filter is supported.

571 Profiles may mandate specific instances of CIM_IndicationFilter and additionally mandate that individual
572 subscription be supported. One reason for taking this approach is to enable clients to subscribe to the
573 most important events within the profile, which may be a subset of those supported. See ANNEX A for
574 more information about specifying indication constraints in referencing profiles.

575 **6.6 Listener Destinations**

576 A few implementation paradigms may be supported by an implementation for management of listener
577 destinations. An implementation may support listener destination management through creation and
578 deletion of instances of CIM_ListenerDestination. Alternately, an implementation may statically create
579 instances of CIM_ListenerDestination and support the specification of desired destinations through
580 modification of the instance of CIM_ListenerDestination. Implementations may support a hybrid model, in
581 which they allow creation, modification, and deletion of instances of CIM_ListenerDestination. If an
582 implementation statically creates instances of CIM_ListenerDestination and supports client modification,
583 the CIM_ListenerDestination.Destination property should be NULL until it is modified by a client. If a client
584 wants to indicate that a CIM_ListenerDestination is no longer in use, and is available to be used to specify
585 a new destination, the client should set the value of the CIM_ListenerDestination.Destination property to
586 NULL.

587 **6.7 Indication Service**

588 The CIM_IndicationService class represents the ability of the WBEM Server to send supported indications
589 to a subscribing client application.

590 Various aspects of the service behavior are modeled, including

- 591 • support for client-instantiated filters
- 592 • definition of indication delivery retry attempts
- 593 • definition of indication delivery retry intervals
- 594 • support for subscription removal action
- 595 • definition of the subscription removal time interval

596 **6.7.1 CIM_IndicationService.FilterCreationEnabled**

597 The FilterCreationEnabled property controls whether clients can create indication filters. If this value is set
598 to False, only the indication filters that exist can be subscribed to. If this value is True, clients may attempt
599 to create filters. The implementation shall reject the client filter creation attempt if the filter specified
600 cannot be supported. Implementations may preset this setting and not allow this value to be modified.

601 **6.7.2 CIM_IndicationService.DeliveryRetryAttempts**

602 The DeliveryRetryAttempts property defines the number of times that the indication service is going to try
603 to deliver an indication to a particular listener destination. This value does not include the original delivery
604 attempt; thus, if this value is set to 0, the indication service tries to deliver the indication only once.
605 Implementations may preset this setting and not allow this value to be modified.

606 **6.7.3 CIM_IndicationService.DeliveryRetryInterval**

607 The DeliveryRetryInterval property defines the minimal time interval in seconds for the indication service
608 to wait before delivering an indication to a particular listener destination that previously failed. The
609 implementation may take longer due to QoS or other processing. Note that implementations may preset
610 this setting and not allow this value to be modified.

611 **6.7.4 CIM_IndicationService.SubscriptionRemovalAction**

612 The SubscriptionRemovalAction property defines the removal action for subscriptions that have two failed
613 indication deliveries without any successful indication deliveries in between and the time between the
614 failed deliveries exceeded the timeout defined in the SubscriptionRemovalTimeInterval property.
615 Implementations may preset this setting and not allow this value to be modified.

616 **6.7.5 CIM_IndicationService.SubscriptionRemovalTimeInterval**

617 The SubscriptionRemovalTimeInterval property defines the minimum time between two failed indication
 618 deliveries without any successful indication deliveries in between before the SubscriptionRemovalAction
 619 goes into effect.

620 **6.7.6 CIM_IndicationServiceSettingData**

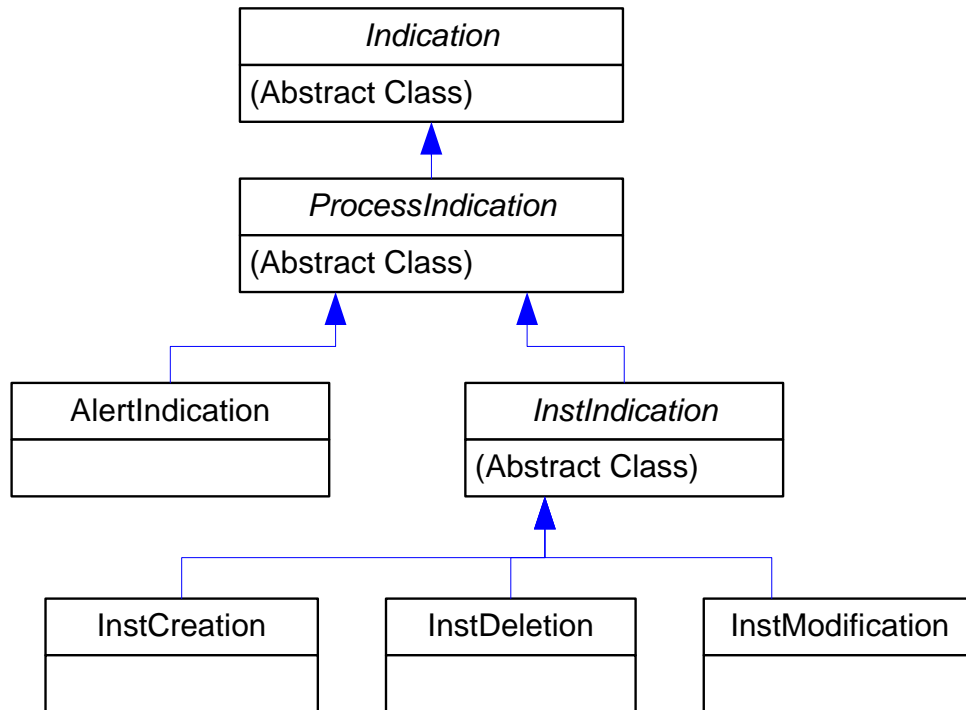
621 The CIM_IndicationServiceSettingData class represents the configuration settings for the
 622 CIM_IndicationService class.

623 **6.8 Indication Types and Processing**

624 The two types of indications are

- 625 • lifecycle indications
- 626 • alert indications

627 Figure 2 depicts the indication class hierarchy. For simplicity, the *CIM_* prefix has been removed from the
 628 class names.



629

630

Figure 2 – Indication Class Diagram

631 **6.8.1 Lifecycle Indications**

632 Lifecycle indications are indications that provide notification of changes in the lifecycle of CIM instances
 633 and CIM class definitions. Only lifecycle indications related to changes in CIM instances are within the
 634 scope of this profile. Lifecycle indications related to changes in CIM instances are reported using
 635 instances of CIM_InstCreation, CIM_InstDeletion, or CIM_InstModification. They are used to convey
 636 changes in the model that reflect observations of changes in the managed element.

637 **6.8.2 Alert Indications**

638 Alert indications draw the attention of subscribing client applications to the occurrence of an event. Alert
639 indications may describe aspects of an event that may or may not have other representation in CIM.

640 **6.9 Subscription Management Authorization**

641 This profile makes no explicit provisions for managing the permissions of a client with respect to its ability
642 to create, modify, or delete indication subscriptions. Any coordination between management clients or
643 access management to govern the ability of one client to make changes that affect the indications
644 delivered to another client are outside the scope of this profile.

645 **7 Implementation**

646 This clause details the requirements related to the arrangement of instances and their properties for
647 implementations of this profile. Methods are listed in Clause 8 ("Methods") and properties are listed in
648 Clause 10 ("CIM Elements").

649 **7.1 CIM_IndicationService**

650 CIM_IndicationService represents a component of the WBEM Server Service that represents support for
651 indication subscription.

652 **7.1.1 General Requirements**

653 One or more instances of CIM_IndicationService shall be instantiated in the Interop namespace.

654 **7.1.2 Profile Default Configuration**

655 To encourage consistent behavior across implementations of the indication service, a common default
656 configuration for each instance of CIM_IndicationService is defined. Unless the CIM_IndicationService
657 has been explicitly configured to behave differently, the following default values should be used for
658 selected properties of CIM_IndicationService:

- 659 • DeliveryRetryAttempts matches 3.
- 660 • DeliveryRetryInterval matches 20.
- 661 • SubscriptionRemovalAction matches 2 (Remove).
- 662 • SubscriptionRemovalTimeInterval matches 2,592,000.

663 NOTE: 2,592,000 seconds is equivalent to 30 days.

664 **7.2 CIM_IndicationServiceSettingData (Optional)**

665 The CIM_IndicationServiceSettingData class is used for the initial configuration settings for the indication
666 service. An instance of CIM_IndicationServiceSettingData may be associated with the instance of
667 CIM_IndicationService through an instance of CIM_ElementSettingData.

668 **7.3 Indication Filters**

669 Support for an indication filter may be explicitly modeled with an instance of CIM_IndicationFilter. Support
670 for an indication filter may be implicitly modeled by instantiating an instance of CIM_FilterCollection that is
671 defined by a profile to contain the indication filter. Indication filters shall be defined as mandatory,
672 optional, or conditional in a profile.

673 If an indication filter is defined as mandatory, the indication filter shall be supported if a server-side
674 implementation of a profile supports at least one indication filter defined in the profile.

675 If an indication filter is defined as optional or conditional, the indication filter may be supported.

676 **7.4 CIM_IndicationFilter**

677 CIM_IndicationFilter represents the potential of an implementation to produce a particular indication. The
678 filter may also describe the model changes that can result in that indication. For life cycle indications, the
679 model change described in the query precedes the production of an indication communicating that
680 change. For other types of indications, the model change may be the production of the indication instance
681 itself.

682 **7.4.1 General Requirements**

683 On a create instance operation request, if the specified CIM_IndicationFilter instance is supported by the
684 implementation, it shall be created in the requested namespace. It shall also be created in the Interop
685 namespace if the requested and Interop namespaces are different. All such instances shall have the
686 same keys.

687 A creation of a CIM_IndicationFilter shall fail if its semantics are unable to be supported in the
688 namespaces listed in SourceNamespaces property entries. If the operation fails, no instances shall be
689 created.

690 Instantiation of a CIM_IndicationFilter may be initiated either by the implementation or by a client
691 application.

692 Each instance of CIM_IndicationFilter shall be associated with exactly one instance of
693 CIM_IndicationService through an instance of CIM_ServiceAffectsElement.

694 One or more instances of CIM_IndicationFilter may be instantiated by either an implementation or the
695 client application. Each instance of CIM_IndicationFilter shall be associated with exactly one instance of
696 CIM_IndicationService through an instance of CIM_ServiceAffectsElement.

697 If the CIM_IndicationFilter.IndividualSubscriptionSupported property has the value True, the instance of
698 CIM_IndicationFilter may be associated with one or more instances of CIM_ListenerDestination through
699 an instance of CIM_IndicationSubscription. If the CIM_IndicationFilter.IndividualSubscriptionSupported
700 property has the value False, the instance of CIM_IndicationFilter shall not be associated with any
701 instances of CIM_ListenerDestination through an instance of CIM_IndicationSubscription.

702 Each instance of CIM_IndicationFilter may be associated with one or more instances of
703 CIM_FilterCollection that represent vendor-supplied indications or other vendor-defined indication
704 collections.

705 **7.4.2 Indication Filter Validity**

706 An instance of CIM_IndicationFilter shall be considered valid under the following conditions:

- 707 • The value of the QueryLanguage property identifies a query language supported by the
708 indication service.
- 709 • The value of the Query property is well formed according to the supported query language.
710 LifeCycle Indication Filters shall include a WHERE clause.
- 711 • The server-side implementation is capable of producing indications that are selected by the
712 filter.

713 **7.4.3 Static Filter Creation**

714 An implementation may instantiate instances of CIM_IndicationFilter for conditional, optional, or vendor-
715 specific indications that are supported in the context of a profile implementation but that are beyond the
716 scope of the indication requirements of that profile. If non-mandatory indications are supported, they shall
717 be categorized into instances of CIM_FilterCollection that match the requirement from the profile
718 (Mandatory, Conditional/Optional) or that are vendor-specific. See 7.6 for CIM_FilterCollection
719 instantiation requirements.

720 Autonomous profiles may define filters that include indications outside the immediate scope of the profile
721 (for example, SELECT * FROM CIM_AlertIndication). Implementations may instantiate vendor-defined
722 filters that are outside the scope of any particular profile.

723 If an instance of CIM_IndicationFilter represents a static filter that is mandatory in the defining profile, it
724 shall be associated through an instance of CIM_MemberOfCollection with the instance of
725 CIM_FilterCollection that is implemented as defined in 7.6. If an instance of CIM_IndicationFilter
726 represents a static filter that is optional or conditional in the defining profile, it shall be associated through
727 an instance of CIM_MemberOfCollection with the instance of CIM_FilterCollection that is implemented as
728 defined in 7.6.

729 **7.4.4 Dynamic Filter Creation**

730 Constraints on the creation of dynamic filters are specified in 8.6.1.

731 Client filters are instantiated by a management application by using the intrinsic method CreateInstance.
732 The management application populates the Query property with a properly formatted query per the
733 requirements of the query language specified in the QueryLanguage property.

734 **7.4.5 Subscribing to Dynamic Filters**

735 Clients subscribe to dynamic filters by creating an instance of CIM_IndicationSubscription that references
736 the CIM_IndicationFilter instance that represents the dynamic filter and an instance of
737 CIM_ListenerDestination that represents the desired destination (see 8.9.1).

738 **7.4.6 CIM_IndicationFilter.Query**

739 When an instance of CIM_IndicationFilter is created, the Query property shall be populated with a
740 properly formed query per the requirements of the query language identified in the QueryLanguage
741 property.

742

743 **EXPERIMENTAL**

744 **7.4.7 CIM_IndicationFilter.SourceNamespaces**

745 For static filters, the SourceNamespaces property shall be formatted according to the format used by the
746 WBEM Server.

747 If an instance of CIM_IndicationFilter is implemented in the Interop namespace, the SourceNamespaces
748 property shall contain the name of each namespace in which indications can be produced or that contains
749 CIM_ManagedElement instances for which indications can be produced, where the indications match the
750 filter specified by the CIM_IndicationFilter instance.

751 If an instance of CIM_IndicationFilter is implemented in an implementation namespace, the
752 SourceNamespaces property does not need to be populated if the indication originates in the same
753 namespace as the filter.

754 As part of defining dynamic filters, the SourceNamespaces array property is filled in by the application
 755 client upon creation of the indication filter or upon subsequent modifications of the indication filter
 756 instance.

757 **EXPERIMENTAL**

758

759 **7.4.8 CIM_IndicationFilter.Name**

760 If an instance of CIM_IndicationFilter is created, the Name property shall be populated with a properly
 761 formed <OrgID> : <LocalID> structured value as defined in the MOF class definition for
 762 CIM_IndicationFilter.

763 For instances of CIM_IndicationFilter defined by DMTF profiles, the value shall be formatted as follows:

764 "DMTF:" <RegisteredName> ":" <unique identifier>

765 where

766 <RegisteredName> is the value assigned by the defining profile to the
 767 CIM_RegisteredProfile.RegisteredName property for the instance of CIM_RegisteredProfile that is
 768 used to advertise implementation of the profile.

769 <unique identifier> is a string value unique within the scope of the defining profile.

770 If the incorporating profile is not a DMTF management profile, the CIM_IndicationFilter.Name property
 771 shall be formatted as follows:

772 <OrgID> : <LocalID>, where <OrgID> and <LocalID> are separated by a colon (:) and
 773 <OrgID> shall include a copyrighted, trademarked, or otherwise unique name that is owned by the
 774 business entity that is creating or defining the value or that is a registered ID assigned to the
 775 business entity by a recognized global authority. In addition, to ensure uniqueness, <OrgID> shall
 776 not contain a colon (:). If this algorithm is used, the first colon to appear in the value shall appear
 777 between <OrgID> and <LocalID>. The <LocalID> is chosen by the business entity and shall be
 778 used uniquely.

779 **7.5 CIM_ListenerDestination**

780 CIM_ListenerDestination represents a destination for the delivery of indications.

781 **7.5.1 General Requirements**

782 On a create instance request, an instance of CIM_ListenerDestination shall be created in the namespace
 783 specified in the request. If the specified namespace is not the interop namespace, an additional instance
 784 of CIM_ListenerDestination shall be created in the interop namespace. Each such instance shall have the
 785 same keys.

786 Creation of a CIM_ListenerDestination shall fail if its semantics are unable to be supported in the interop
 787 namespace or its creation namespace.

788 Instantiation of a CIM_ListenerDestination may be initiated either by the implementation or by a client
 789 application.

790 Each instance of CIM_ListenerDestination shall be associated with exactly one instance of
 791 CIM_IndicationService through an instance of CIM_ServiceAffectsElement.

792 Any instance of CIM_ListenerDestination may be associated with one or more instances of
793 CIM_IndicationFilter through an instance of CIM_IndicationSubscription, with one or more instances of
794 CIM_FilterCollection through an instance of CIM_FilterCollectionSubscription, or both.

795 If an instance of CIM_ListenerDestination is not associated with any instance of CIM_IndicationFilter or
796 CIM_FilterCollection, the client application should reuse the instance of CIM_ListenerDestination and not
797 create a new one.

798 **7.5.2 CIM_ListenerDestination.Destination**

799 If the value of the CIM_ListenerDestination.Destination property is not NULL, the property value shall be a
800 valid IETF Uniform Resource Identifier value (as defined in [RFC 3986](#)). The implementation shall reject a
801 value that does not include the scheme, host and port as part of the URI Location.

802 **7.5.3 CIM_ListenerDestination.PersistenceType**

803 The CIM_ListenerDestination.PersistenceType property shall contain a value of 3 (Transient), 2
804 (Permanent), or NULL. A value of NULL shall default to Permanent behavior.

805 The PersistenceType property describes the durability of the destination for indication delivery. When the
806 PersistenceType property value is NULL or is explicitly set to 2 (Permanent), it indicates to the WBEM
807 Server that the delivery destination for the subscribed indications is long-lived and shall be available for
808 indication delivery (for example, the destination identifies a system log file). An inability of the WBEM
809 Server to deliver an indication to a Permanent destination shall be treated as an error condition.

810 A client may choose to set the value of the PersistenceType property to 3 (Transient) to indicate to the
811 WBEM Server that the delivery destination for the subscribed indications is short-lived (for example, a
812 task progress meter in a graphical management application). Instances of CIM_ListenerDestination that
813 have the PersistenceType property set to 3 (Transient) shall be deleted if the WBEM Server cannot
814 deliver a subscribed indication to the client destination (based on the
815 CIM_IndicationServiceSettingData.DeliveryRetryAttempts property). All instances of
816 CIM_IndicationSubscription or CIM_FilterCollectionSubscription that reference the instance of
817 CIM_ListenerDestination shall be deleted as well.

818 **7.6 CIM_FilterCollection**

819 CIM_FilterCollection is used to define a collection of indication filters supported in the context of a
820 particular profile or implementation.

821 Each instance of CIM_FilterCollection shall be instantiated in the Interop Namespace.

822 Creation of a CIM_FilterCollection shall fail if its semantics are unable to be supported in the interop
823 namespace.

824 Either a CIM client or the implementation may create instances of CIM_FilterCollection.

825 **7.6.1 Relationship with Indication Service**

826 Every instance of CIM_FilterCollection shall be associated with exactly one instance of
827 CIM_IndicationService through an instance of CIM_OwningCollectionElement.

828 **7.6.2 Nested Filter Collections**

829 An instance of CIM_FilterCollection may be associated with one or more instances of
830 CIM_FilterCollection through an instance of CIM_MemberOfCollection.

831 7.6.3 Relationship with Registered Profile

832 Each instance of CIM_FilterCollection shall be associated with exactly one instance of
 833 CIM_RegisteredProfile through an instance of CIM_ConcreteDependency where the instance of
 834 CIM_RegisteredProfile represents the registration of the profile to which the indications pertain. This
 835 allows a client to discover all of the mandatory, optional, conditional, and vendor-specific indication filters
 836 supported by the implementation of a particular profile.

837 7.6.4 CIM_FilterCollection.CollectionName

838 The CollectionName property shall be generated as a structured value property of the form
 839 <OrgID> : <CollectionID> as specified by the MOF definition of the CIM_FilterCollection class.

840 For instances of CIM_FilterCollection defined by DMTF profiles, the value for CollectionName shall be
 841 formatted as follows:

842 "DMTF:" <unique identifier>

843 where:

844 <unique identifier> is a string value unique within the scope of the defining profile.

845 If the incorporating profile is not a DMTF management profile, the CIM_FilterCollection.CollectionName
 846 property shall be formatted as follows:

847 <OrgID> : <LocalID>, where <OrgID> and <LocalID> are separated by a colon (:) and
 848 <OrgID> shall include a copyrighted, trademarked, or otherwise unique name that is owned by the
 849 business entity that is creating or defining the value or that is a registered ID assigned to the
 850 business entity by a recognized global authority. In addition, to ensure uniqueness, <OrgID> shall
 851 not contain a colon (:). If this algorithm is used, the first colon to appear in the value shall appear
 852 between <OrgID> and <LocalID>. <LocalID> is chosen by the business entity and shall be used
 853 uniquely.

854 7.7 WBEM Server Requirements

855 WBEM Server may support indications. However, if a WBEM Server supports indications, the WBEM
 856 Server shall

- 857 • Instantiate a single instance of CIM_IndicationService
- 858 • Support the indications of the *Indications Profile* as specified in the CIM Elements table in
 859 Clause 10
- 860 • Support the ability to subscribe for indications using the classes defined in the *Indications*
 861 *Profile*
- 862 • Support indication filters in the Interop namespace
- 863 • support indications as defined in profiles that are advertised as implemented in the Interop
 864 namespace

865 A WBEM Server may support client-instantiated indication filters (instances of CIM_Indication filter or
 866 CIM_FilterCollection).

867 7.8 CIM_IndicationSubscription

868 On a create instance request, if the corresponding CIM_IndicationSubscription instance is supported, it
 869 shall be created in the requested namespace. It shall also be created in the interop namespace if the
 870 requested namespace and the Interop namespace are different. Additionally, for each source namespace

871 listed in the corresponding CIM_IndicationFilter instance found in the Interop namespace a corresponding
872 instance of CIM_IndicationSubscription should be instantiated between the corresponding
873 CIM_IndicationFilter instance in the source namespace and the associated CIM_ListenerDestination
874 instance in that same namespace if it exists.

875 A creation of a CIM_IndicationSubscription shall fail if its semantics are unable to be supported in the
876 Interop namespace or its creation namespace.

877 Instantiation of a CIM_IndicationSubscription may be initiated either by the implementation or by a client
878 application.

879 **7.8.1 CIM_IndicationSubscription.OnFatalErrorPolicy**

880 A client uses the CIM_IndicationSubscription.OnFatalErrorPolicy property to define the desired behavior
881 for a subscription when a failure occurs that implies that some aspect of indication generation processing
882 or dispatch is no longer functioning and indications may be lost. A value of 4 (Remove) requires that an
883 implementation abide by the CIM_IndicationService.SubscriptionRemovalAction setting (see 7.1) and
884 behavior. The default value for this property should be 4 (Remove) if the client application does not
885 specify a value.

886 **7.8.2 CIM_IndicationSubscription.RepeatNotificationPolicy**

887 The RepeatNotificationPolicy property of the CIM_IndicationSubscription class defines the desired
888 behavior for handling indications that report the occurrence of the same underlying event (for example,
889 the disk is still generating I/O errors and has not yet been repaired). This also includes multiple
890 indications that are generated from a single indication filter. Repeated indications are indications in which
891 all the indication instance property values are the same except for the IndicationIdentifier and
892 IndicationTime properties.

893 The use of the RepeatNotificationCount, RepeatNotificationInterval, and RepeatNotificationGap
894 properties defined in the CIM_IndicationSubscription class depends on the value of the
895 RepeatNotificationPolicy property.

896 The RepeatNotificationPolicy may vary by implementation (or even IndicationFilter). However, it shall be
897 specified on all subscriptions. The valid values for an implementation are as follows:

- 898 • 2 (None)
- 899 • 3 (Suppress)
- 900 • 4 (Delay)

901 A profile may restrict these values further for any given indication filter, but it shall not expand the values
902 to other policies due to interoperability constraints. For example, a profile may restrict InstCreation filters
903 for CIM_ComputerSystem to 2 (None) and restrict InstModification filters on CIM_StorageVolume to
904 Suppress or Delay. However, profiles shall not define Unknown as a valid setting for the
905 RepeatNotificationPolicy property.

906 RepeatNotificationPolicy = None

907 If the value of the RepeatNotificationPolicy property is 2 (None), special processing of repeat indications
908 shall not be performed.

909 RepeatNotificationPolicy = Suppress

910 If the value of the RepeatNotificationPolicy property is 3 (Suppress), indications are delivered up to the
911 value of the RepeatNotificationCount property; after that, all subsequent indications are suppressed for
912 the time interval defined in the RepeatNotificationInterval property. When the time interval expires,
913 suppression expires. Any indication that matches the filter is included in the calculation of the indication

914 count that is compared with the RepeatNotificationCount value. A new interval starts when the next
915 indication for this event is received after the previous interval has expired.

916 RepeatNotificationPolicy = Delay

917 If the value of the RepeatNotificationPolicy property is 4 (Delay) and an indication is generated, this
918 indication shall be suppressed if, including this indication, RepeatNotificationCount or fewer indications for
919 the same event have been generated during the time interval defined by RepeatNotificationInterval. If this
920 indication is the RepeatNotificationCount + 1 indication instance generated, this indication shall be
921 delivered and all subsequent indications for this event shall be ignored until the RepeatNotificationGap
922 has elapsed. A RepeatNotificationInterval may not overlap a RepeatNotificationGap time interval.

923 **7.9 CIM_FilterCollectionSubscription**

924 On a create instance request, if the corresponding CIM_FilterCollectionSubscription instance is
925 supported, it shall be created in the creation namespace, and if different, the Interop namespace.

926 A creation of a CIM_FilterCollectionSubscription shall fail if its semantics are unable to be supported in
927 the Interop namespace or its creation namespace.

928 Instantiation of a CIM_FilterCollectionSubscription may be initiated either by the implementation or by a
929 client application.

930 **7.10 Indication Delivery**

931 Indication delivery is based on a publish/subscribe event paradigm. Thus, the subscriber (client or
932 destination) may not always be available at the time the indication occurs. If the listener is not available
933 when the WBEM Server attempts to deliver the indication, the WBEM Server may make additional
934 attempts to deliver the indication. It is implementation specific whether the deliver of an indication is
935 preempted when concurrently the subscription is disabled or deleted when the indication is being
936 attempted. Once WBEM Server has successfully delivered the indication, it shall not attempt to do so
937 again. The number and interval of retry attempts are specified by the DeliveryRetryAttempts and
938 DeliveryRetryInterval properties of CIM_IndicationServiceSettingData class, and may or may not be
939 configurable.

940 Instances of CIM_ListenerDestination that have PersistenceType property set to 3 (Transient) shall be
941 deleted if the WBEM Server cannot deliver a subscribed indication to the client destination (based on the
942 CIM_IndicationServiceSettingData.DeliveryRetryAttempts property). All instances of the
943 CIM_IndicationSubscription or CIM_FilterCollectionSubscription associations that reference the instance
944 of CIM_ListenerDestination shall be deleted as well, unsubscribing the transient client from the
945 indications.

946 **7.11 Using Message Registries**

947 A message registry is an XML document that contains entries that consist of standard message identifiers
948 and static and dynamic message elements. An instance of CIM_AlertIndication may contain a standard
949 message. The OwningEntity, MessageID, Message, and MessageArguments properties of the
950 CIM_AlertIndication class are used to describe the content of an alert indication that is produced by
951 instrumentation for a managed element. See DSP0228, Message Registry XML Schema Specification,
952 for further provisions.

953 If an instance of CIM_AlertIndication contains a standard message, the following constraints shall be met:

- 954 • The MessageID property shall contain the message identifier from the registry.
- 955 • The OwningEntity property shall contain the identifier of the organization that defined the
956 registry.

- 957 • The MessageArguments property shall contain the dynamic content of the message as defined
958 by the message registry. The absolute ordering of the dynamic content shall be maintained.
- 959 • The Message property may contain the formatted message from the registry.

960 **7.12 Indication Subscription Removal**

961 The WBEM Server may remove an indication subscription if the delivery destination (that is,
962 CIM_ListenerDestination.Destination) cannot be reached within the number of delivery retry attempts and
963 the retry interval specified in the CIM_IndicationServiceSettingData instance's DeliveryRetryAttempts and
964 DeliveryRetryInterval properties. The removal of an indication subscription is governed by the
965 CIM_IndicationService.SubscriptionRemovalAction property value. If the SubscriptionRemovalAction
966 property has a value of 2 (Remove), the subscription shall be removed after two failed indication
967 deliveries occur without any successful indication deliveries in between and with the time between the
968 deliveries exceeding the timeout specified in the CIM_IndicationService.SubscriptionRemovalTimeInterval
969 property.

970 A client may remove an indication subscription by performing a DeleteInstance operation on the
971 association instance created to activate the indication subscription (that is, the instance of
972 CIM_IndicationSubscription or CIM_FilterCollectionSubscription). If there are no other subscriptions to
973 this destination, the client may additionally remove the CIM_ListenerDestination that identified the
974 indication delivery destination or leave that instance for future indication subscription.

975 **7.13 Implementation of Profile Specifications**

976 An implementation shall deliver all supported lifecycle indications to all clients that are subscribed to filters
977 that select the supported alert indications.

978 An implementation shall deliver all supported alert indications to all clients that are subscribed to filters
979 that select the supported alert indications.

980 **7.14 CIM_IndicationServiceCapabilities**

981 An instance of CIM_IndicationServiceCapabilities shall be instantiated when the implementation supports
982 the direct modification of any properties of the indication service. The CIM_IndicationServiceCapabilities
983 instance shall be associated with the affected instance of CIM_IndicationService through an instance of
984 CIM_ElementCapabilities. If the implementation does not support the direct modification of any properties
985 on the indication service, the implementation may not instantiate an instance of
986 CIM_IndicationServiceCapabilities. The absence of an instance of CIM_IndicationServiceCapabilities
987 associated with the CIM_IndicationService indicates that modification of properties of the
988 CIM_IndicationService by a client is not supported.

989 **7.15 Indication.IndicationFilterName Property**

990 At the time of the creation of an indication, an implementation may not have the information about the
991 indication filters and/or filter collections that match the created indication. After the creation of the
992 indication, the information about the indication filters and/or filter collections that matched the indication
993 becomes known. Before the delivery of the indication, the information about all the matched indication
994 filters shall be included in the IndicationFilterName property. The IndicationFilterName property contains
995 the indication filter names (values of property CIM_IndicationFilter.Name) for the indication that matched
996 the indication filters listed in this array. For each active subscription to each of the matched indication
997 filters and/or filter collections, the indication shall be delivered. A management client may use this
998 property to match the indication received with semantics known a priori by the client. A management
999 profile ought to list the indications that a profile implementation can produce and why. A client
1000 implementation of this profile uses this property to determine what indication was produced, as
1001 documented in the profile, and why.

1002 If the IndicationFilter class is implemented, then the IndicationFilterName property of each instance of
1003 CIM_Indication shall contain the names of the indication filters that matched the indication. Otherwise,
1004 this property shall contain implementation specific name(s) that allow the client to match the indication
1005 with the implementation specific semantics.

1006 **7.16 Advertising Profile Conformance**

1007 Each instance of CIM_IndicationService shall be associated with exactly one instance of
1008 CIM_RegisteredProfile, where the instance of CIM_RegisteredProfile is implemented as defined in 10.19.

1009 **7.17 Indications for the Indications Profile**

1010 This clause details the constraints for supporting indications specific to the *Indications Profile*.

1011 **7.17.1 Mandatory Indications**

1012 No mandatory indications are specified in this profile; therefore, there is no definition of a mandatory filter
1013 collection.

1014 **7.17.2 Conditional and Optional Indications**

1015 This clause describes the requirements for conditional and optional indications for implementations of the
1016 Indications Profile.

1017 **Conditional/Optional Filter Collection**

1018 There may be an instance of CIM_FilterCollection in which the CIM_FilterCollection.CollectionName
1019 property has the value "DMTF:Indications:Conditional/Optional".

1020 **Listener Destination Removal**

1021 There may be an indication filter as defined in this clause. Subscribers to this indication filter can be
1022 informed when a listener destination is deleted.

1023 **7.17.2.1.1 Indication Filter Name**

1024 The indication filter name shall be "DMTF:Indications:ListenerDestinationRemoval".

1025 **7.17.2.1.2 Filtered Events**

1026 The indication filter shall filter for notification of the deletion of instances of CIM_ListenerDestination.

1027 **7.17.2.1.3 Query**

1028 The CIM_IndicationFilter.Query property may have the value "SELECT * FROM CIM_InstDeletion
1029 WHERE SourceInstance ISA CIM_ListenerDestination".

1030 **Indication Subscription Removal**

1031 There may be an indication filter as defined in this clause.

1032 Subscribers to this indication are going to be informed when a subscription is deleted. An indication is not
1033 going to be sent to the clients who have unsubscribed because the subscription is absent.

1034 **7.17.2.1.4 Indication Filter Name**

1035 The indication filter name shall be "DMTF:Indications:IndicationSubscriptionRemoval".

1036 7.17.2.1.5 Filtered Events

1037 The indication filter shall filter for notification of the deletion of instances of CIM_IndicationSubscription.

1038 7.17.2.1.6 Query

1039 The CIM_IndicationFilter.Query property may have the value "SELECT * FROM CIM_InstDeletion
1040 WHERE SourceInstance ISA CIM_IndicationSubscription".

1041 Filter Collection Subscription Removal

1042 There may be an indication filter as defined in this clause.

1043 Subscribers to this indication are going to be informed when a subscription to a filter collection is deleted.

1044 An indication is not going to be sent to the clients who have unsubscribed because the subscription is
1045 absent.

1046 7.17.2.1.7 Indication Filter Name

1047 The indication filter name shall be "DMTF:Indications:FilterCollectionSubscriptionRemoval".

1048 7.17.2.1.8 Filtered Events

1049 The indication filter shall filter for notification of the deletion of instances of
1050 CIM_FilterCollectionSubscription.

1051 7.17.2.1.9 Query

1052 The CIM_IndicationFilter.Query property may have the value "SELECT * FROM CIM_InstDeletion
1053 WHERE SourceInstance ISA CIM_FilterCollectionSubscription".

1054 8 Methods

1055 This section details the requirements for supporting intrinsic operations for the CIM elements defined by
1056 this profile. No extrinsic methods are defined by this profile.

1057 8.1 Profile Conventions for Operations

1058 For each profile class (including associations), the implementation requirements for operations, including
1059 those in the following default list, are specified in class-specific subclauses of this clause.

1060 The default list of operations is as follows:

- 1061 • GetInstance
- 1062 • Associators
- 1063 • AssociatorNames
- 1064 • References
- 1065 • ReferenceNames
- 1066 • EnumerateInstances
- 1067 • EnumerateInstanceNames

1068 **8.2 CIM_HostedService**

1069 Table 2 lists implementation requirements for operations. If implemented, these operations shall be
 1070 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 2, all operations in
 1071 the default list in 8.1 shall be implemented as defined in [DSP0200](#).

1072 NOTE: Related profiles may define additional requirements on operations for the profile class.

1073 **Table 2 – Operations: CIM_HostedService**

Operation	Requirement	Messages
Associators	Unspecified	None
AssociatorNames	Unspecified	None
References	Unspecified	None
ReferenceNames	Unspecified	None

1074 **8.3 CIM_IndicationService**

1075 Table 3 lists implementation requirements for operations. If implemented, these operations shall be
 1076 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 3, all operations in
 1077 the default list in 8.1 shall be implemented as defined in [DSP0200](#).

1078 NOTE: Related profiles may define additional requirements on operations for the profile class.

1079 **Table 3 – Operations: CIM_IndicationService**

Operation	Requirement	Messages
ModifyInstance	Conditional	See 8.3.1.

1080 **8.3.1 CIM_IndicationService—ModifyInstance**

1081 This section details the requirements for the ModifyInstance operation applied to an instance of
 1082 CIM_IndicationService.

1083 **General**

1084 Support for the ModifyInstance operation is conditional. The ModifyInstance operation shall be supported
 1085 for an instance of CIM_IndicationService if an instance of CIM_IndicationServiceCapabilities is associated
 1086 with the CIM_IndicationService instance and at least one of the following properties of the
 1087 CIM_IndicationServiceCapabilities instance has a value of True:

- 1088 • FilterCreationEnabledIsSettable
- 1089 • DeliveryRetryAttemptsIsSettable
- 1090 • DeliveryRetryIntervalsSettable
- 1091 • SubscriptionRemovalActionIsSettable
- 1092 • SubscriptionRemovalTimeIntervalsSettable

1093 **CIM_IndicationService.FilterCreationEnabled**

1094 If an instance of CIM_IndicationServiceCapabilities is associated with the CIM_IndicationService instance
 1095 and the FilterCreationEnabledIsSettable property of the CIM_IndicationServiceCapabilities instance has a

1096 value of True, the implementation shall allow the ModifyInstance operation to change the value of the
1097 FilterCreationEnabled property of the CIM_IndicationService instance.

1098 If an instance of CIM_IndicationServiceCapabilities is associated with the CIM_IndicationService instance
1099 and the FilterCreationEnabledIsSettable property of the CIM_IndicationServiceCapabilities instance has a
1100 value of False, the implementation shall not allow the ModifyInstance operation to change the value of the
1101 FilterCreationEnabled property of the CIM_IndicationService instance.

1102 **CIM_IndicationService.DeliveryRetryAttempts**

1103 If an instance of CIM_IndicationServiceCapabilities is associated with the CIM_IndicationService instance
1104 and the DeliveryRetryAttemptsIsSettable property of the CIM_IndicationServiceCapabilities instance has
1105 a value of True, the implementation shall allow the ModifyInstance operation to change the value of the
1106 DeliveryRetryAttempts property of the CIM_IndicationService instance.

1107 If an instance of CIM_IndicationServiceCapabilities is associated with the CIM_IndicationService instance
1108 and the DeliveryRetryAttemptsIsSettable property of the CIM_IndicationServiceCapabilities instance has
1109 a value of False, the implementation shall not allow the ModifyInstance operation to change the value of
1110 the DeliveryRetryAttempts property of the CIM_IndicationService instance.

1111 **CIM_IndicationService.DeliveryRetryInterval**

1112 If an instance of CIM_IndicationServiceCapabilities is associated with the CIM_IndicationService instance
1113 and the DeliveryRetryIntervallsSettable property of the CIM_IndicationServiceCapabilities instance has a
1114 value of True, the implementation shall allow the ModifyInstance operation to change the value of the
1115 DeliveryRetryInterval property of the CIM_IndicationService instance.

1116 If an instance of CIM_IndicationServiceCapabilities is associated with the CIM_IndicationService instance
1117 and the DeliveryRetryIntervallsSettable property of the CIM_IndicationServiceCapabilities instance has a
1118 value of False, the implementation shall not allow the ModifyInstance operation to change the value of the
1119 DeliveryRetryInterval property of the CIM_IndicationService instance.

1120 **CIM_IndicationService.SubscriptionRemovalAction**

1121 If an instance of CIM_IndicationServiceCapabilities is associated with the CIM_IndicationService instance
1122 and the SubscriptionRemovalActionIsSettable property of the CIM_IndicationServiceCapabilities instance
1123 has a value of True, the implementation shall allow the ModifyInstance operation to change the value of
1124 the SubscriptionRemovalAction property of the CIM_IndicationService instance.

1125 If an instance of CIM_IndicationServiceCapabilities is associated with the CIM_IndicationService instance
1126 and the SubscriptionRemovalActionIsSettable property of the CIM_IndicationServiceCapabilities instance
1127 has a value of False, the implementation shall not allow the ModifyInstance operation to change the value
1128 of the SubscriptionRemovalAction property of the CIM_IndicationService instance.

1129 **CIM_IndicationService.SubscriptionRemovalTimeInterval**

1130 If an instance of CIM_IndicationServiceCapabilities is associated with the CIM_IndicationService instance
1131 and the SubscriptionRemovalTimeIntervalIsSettable property of the CIM_IndicationServiceCapabilities
1132 instance has a value of True, the implementation shall allow the ModifyInstance operation to change the
1133 value of the SubscriptionTimeInterval property of the CIM_IndicationService instance.

1134 If an instance of CIM_IndicationServiceCapabilities is associated with the CIM_IndicationService instance
1135 and the SubscriptionRemovalTimeIntervalIsSettable property of the CIM_IndicationServiceCapabilities
1136 instance has a value of False, the implementation shall not allow the ModifyInstance operation to change
1137 the value of the SubscriptionTimeInterval property of the CIM_IndicationService instance.

1138 **8.4 CIM_IndicationServiceCapabilities**

1139 All operations in the default list in 8.1 shall be implemented as defined in [DSP0200](#).

1140 NOTE: Related profiles may define additional requirements on operations for the profile class.

1141 **8.5 CIM_IndicationServiceSettingData**

1142 All operations in the default list in 8.1 shall be implemented as defined in [DSP0200](#).

1143 NOTE: Related profiles may define additional requirements on operations for the profile class.

1144 **8.6 CIM_IndicationFilter**

1145 Table 4 lists implementation requirements for operations. If implemented, these operations shall be
 1146 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 4, all operations in
 1147 the default list in 8.1 shall be implemented as defined in [DSP0200](#).

1148 NOTE: Related profiles may define additional requirements on operations for the profile class.

1149 **Table 4 – Operations: CIM_IndicationFilter**

Operation	Requirement	Messages
CreateInstance	Conditional	See 8.6.1.
DeleteInstance	Conditional	See 8.6.2.
ModifyInstance	Optional	See 8.6.3.

1150 **8.6.1 CIM_IndicationFilter—CreateInstance**

1151 This section details the requirements for the CreateInstance operation applied to an instance of
 1152 CIM_IndicationFilter.

1153 **General Requirements**

1154 The WBEM Server shall return a status code of CIM_ERROR_NOT_SUPPORTED in response to the
 1155 CreateInstance method invoked by the client if the indication service is unable to support the indication
 1156 filter. If an error is returned, the subscription is not activated.

1157 If the CIM_IndicationFilter is valid and the indication service is able to support it, the server-side
 1158 implementation shall create an instance CIM_ServiceAffectsElement that associates the
 1159 CIM_IndicationFilter instance to the instance of CIM_IndicationService.

1160 If a client attempts to create an instance of CIM_IndicationFilter by using the CreateInstance operation
 1161 and the implementation determines that the query is invalid or not supportable, the implementation shall
 1162 reject the operation and return a status code of CIM_ERROR_INVALID_PARAMETER in a CIM_Error
 1163 instance response.

1164 If a client attempts to create an instance of CIM_IndicationFilter by using the CreateInstance operation
 1165 and dynamic filters are not supported by the WBEM Server in this case, the WBEM Server shall reject the
 1166 operation and return a status code of CIM_ERROR_NOT_SUPPORTED in a CIM_Error instance
 1167 response.

1168 If a client attempts to create an instance of CIM_IndicationFilter by using the CreateInstance operation
 1169 and the implementation is able to determine that an identical instance of CIM_IndicationFilter exists, the
 1170 implementation should reject the operation and return a status code of CIM_ERROR_ALREADY_EXISTS
 1171 in a CIM_Error instance response. The existing CIM_IndicationFilter instance object path shall be
 1172 specified in the returned CIM_Error.ErrorSource instance property.

1173 Clients should not populate the key properties of CIM_IndicationFilter when performing the
1174 CreateInstance operation. If the client populates the key properties of CIM_IndicationFilter, the
1175 implementation shall ignore these properties.

1176 **Conditional Requirement**

1177 The CreateInstance operation shall be supported for CIM_IndicationFilter if either of the following
1178 conditions is met:

- 1179 • The CIM_IndicationService.FilterCreationEnabled property has the value True.
- 1180 • An associated instance of CIM_IndicationServiceCapabilities exists, and the
1181 CIM_IndicationServiceCapabilities.FilterCreationEnabledIsSettable property has the value True.

1182 **8.6.2 CIM_IndicationFilter—DeleteInstance**

1183 This section details the requirements for the DeleteInstance operation applied to an instance of
1184 CIM_IndicationFilter.

1185 **General Requirements**

1186 If the instance of CIM_IndicationFilter is referenced by one or more instances of
1187 CIM_IndicationSubscription, the DeleteInstance operation shall not delete the CIM_IndicationFilter
1188 instance. If the CIM_IndicationFilter instance is not deleted, the operation shall return an error.

1189 If an instance of CIM_IndicationFilter is deleted, all instances of CIM_ServiceAffectsElement that
1190 reference the instance of CIM_IndicationFilter shall also be deleted by the server-side implementation.

1191 If a client attempts to delete a static instance of CIM_IndicationFilter by using the DeleteInstance
1192 operation, the WBEM Server shall reject the operation and return a status code of
1193 CIM_ERROR_NOT_SUPPORTED.

1194 **Conditional Requirement**

1195 The DeleteInstance operation shall be supported for CIM_IndicationFilter if either of the following
1196 conditions is met:

- 1197 • The CIM_IndicationService.FilterCreationEnabled property has the value True.
- 1198 • An associated instance of CIM_IndicationServiceCapabilities exists, and the
1199 CIM_IndicationServiceCapabilities.FilterCreationEnabledIsSettable property has the value True.

1200 **8.6.3 CIM_IndicationFilter—ModifyInstance**

1201 The ModifyInstance operation may be supported for an instance of CIM_IndicationFilter that represents a
1202 dynamic filter. The ModifyInstance operation may be supported for an instance of CIM_IndicationFilter
1203 that represents a static filter that is not defined by a profile. The ModifyInstance operation shall not be
1204 supported for an instance of CIM_IndicationFilter that represents a static filter defined by a profile.

1205 **8.7 CIM_FilterCollection**

1206 All operations in the default list in 8.1 shall be implemented as defined in [DSP0200](#).

1207 NOTE: Related profiles may define additional requirements on operations for the profile class.

1208 **8.8 CIM_ListenerDestination**

1209 Table 5 lists implementation requirements for operations. If implemented, these operations shall be
 1210 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 5, all operations in
 1211 the default list in 8.1 shall be implemented as defined in [DSP0200](#).

1212 NOTE: Related profiles may define additional requirements on operations for the profile class.

1213 **Table 5 – Operations: CIM_ListenerDestination**

Operation	Requirement	Messages
CreateInstance	Optional	See 8.8.1.
DeleteInstance	Optional	See 8.8.2.
ModifyInstance	Optional	See 8.8.3.

1214 **8.8.1 CIM_ListenerDestination—CreateInstance**

1215 This section details the requirements for the CreateInstance operation applied to an instance of
 1216 CIM_ListenerDestination.

1217 Upon successful creation of the instance of CIM_ListenerDestination, the server-side implementation
 1218 shall create an instance of CIM_ServiceAffectsElement in which the AffectedElement property value
 1219 references the instance of CIM_ListenerDestination created and the Service property references the
 1220 instance of the CIM_IndicationService that can manage the listener destination information.

1221 If as many instances of CIM_ListenerDestination exist as the value of the
 1222 CIM_IndicationServiceCapabilities.MaxListenerDestination property, the CreateInstance method shall fail.

1223 **8.8.2 CIM_ListenerDestination—DeleteInstance**

1224 This section details the requirements for the DeleteInstance operation applied to an instance of
 1225 CIM_ListenerDestination.

1226 If the instance of CIM_ListenerDestination is referenced by one or more instances of
 1227 CIM_IndicationSubscription or CIM_FilterCollectionSubscription, the DeleteInstance operation shall not
 1228 delete the CIM_ListenerDestination instance. Otherwise, if the CIM_ListenerDestination instance is not
 1229 deleted, the operation shall return an error.

1230 When an instance of CIM_ListenerDestination is deleted, all instances of CIM_ServiceAffectsElement in
 1231 which the AffectedElement property value references the instance of CIM_ListenerDestination to be
 1232 deleted shall also be deleted.

1233 **8.8.3 CIM_ListenerDestination—ModifyInstance**

1234 The ModifyInstance operation may be supported for an instance of CIM_ListenerDestination.

1235 **8.9 CIM_IndicationSubscription**

1236 Table 6 lists implementation requirements for operations. If implemented, these operations shall be
 1237 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 6, all operations in
 1238 the default list in 8.1 shall be implemented as defined in [DSP0200](#).

1239 NOTE: Related profiles may define additional requirements on operations for the profile class.

1240

Table 6 – Operations: CIM_IndicationSubscription

Operation	Requirement	Messages
Associators	Unspecified	None
AssociatorNames	Unspecified	None
References	Unspecified	None
ReferenceNames	Unspecified	None
CreateInstance	Conditional. See 8.9.1.	None
DeleteInstance	Conditional. See 8.9.2.	None
ModifyInstance	Optional. See 8.9.3.	None

1241 8.9.1 CIM_IndicationSubscription—CreateInstance

1242 This section details the requirements for the CreateInstance operation applied to an instance of
1243 CIM_IndicationSubscription.

1244 Support for the CreateInstance operation is conditional. The CreateInstance operation shall be supported
1245 if at least one instance of CIM_IndicationFilter is associated with the CIM_IndicationService through an
1246 instance of CIM_ServiceAffectsElement, where the CIM_IndicationFilter.IndividualSubscriptionSupported
1247 property has the value True.

1248 The CreateInstance operation shall return a status code of CIM_ERROR_NOT_SUPPORTED if the
1249 referenced instance of CIM_IndicationFilter is not valid. If an error is returned, the subscription is not
1250 activated. Successful creation of an instance of CIM_IndicationSubscription activates the client
1251 application's subscription for delivery of the indications selected by the specified indication filter to the
1252 specified destination.

1253 The CreateInstance operation shall return a status code of CIM_ERROR_NOT_SUPPORTED if the value
1254 of the CIM_IndicationFilter.IndividualSubscriptionSupported property is False for the referenced instance
1255 of CIM_IndicationFilter.

1256 8.9.2 CIM_IndicationSubscription—DeleteInstance

1257 This section details the requirements for the DeleteInstance operation applied to an instance of
1258 CIM_IndicationSubscription.

1259 Support for the DeleteInstance operation is conditional. The DeleteInstance operation shall be supported
1260 if at least one instance of CIM_IndicationFilter is associated with the CIM_IndicationService instance
1261 through an instance of CIM_ServiceAffectsElement, where the
1262 CIM_IndicationFilter.IndividualSubscriptionSupported property has the value True.

1263 Upon deletion of an instance of CIM_IndicationSubscription, the client application subscription is
1264 deactivated and the destination is considered unsubscribed.

1265 8.9.3 CIM_IndicationSubscription—ModifyInstance

1266 The ModifyInstance operation may be supported for an instance of CIM_IndicationSubscription.

1267 8.10 CIM_FilterCollectionSubscription

1268 Table 7 lists implementation requirements for operations. If implemented, these operations shall be
1269 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 7, all operations in
1270 the default list in 8.1 shall be implemented as defined in [DSP0200](#).

1271 NOTE: Related profiles may define additional requirements on operations for the profile class.

1272

Table 7 – Operations: CIM_FilterCollectionSubscription

Operation	Requirement	Messages
Associators	Unspecified	None
AssociatorNames	Unspecified	None
References	Unspecified	None
ReferenceNames	Unspecified	None
CreateInstance	Mandatory. See 8.10.1.	None
DeleteInstance	Mandatory. See 8.10.2.	None
ModifyInstance	Optional. See 8.10.3.	None

1273 **8.10.1 CIM_FilterCollectionSubscription—CreateInstance**

1274 This section details the requirements for the CreateInstance operation applied to an instance of
 1275 CIM_FilterCollectionSubscription.

1276 Successful creation of an instance of CIM_FilterCollectionSubscription activates the client application’s
 1277 subscription for delivery of the indications selected by the indication filters that are members of the
 1278 collection subscribed to. Subscriptions are also recursively activated to collections that are members of
 1279 the collection subscribed to.

1280 **8.10.2 CIM_FilterCollectionSubscription—DeleteInstance**

1281 This section details the requirements for the DeleteInstance operation applied to an instance of
 1282 CIM_FilterCollectionSubscription.

1283 When an instance of CIM_FilterCollectionSubscription is deleted, the client application subscription is
 1284 deactivated and the client is considered unsubscribed.

1285 **8.10.3 CIM_FilterCollectionSubscription—ModifyInstance**

1286 The ModifyInstance operation may be supported for an instance of CIM_FilterCollectionSubscription.

1287 **8.11 CIM_ServiceAffectsElement**

1288 Table 8 lists implementation requirements for operations. If implemented, these operations shall be
 1289 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 8, all operations in
 1290 the default list in 8.1 shall be implemented as defined in [DSP0200](#).

1291 NOTE: Related profiles may define additional requirements on operations for the profile class.

1292 **Table 8 – Operations: CIM_ServiceAffectsElement**

Operation	Requirement	Messages
Associators	Unspecified	None
AssociatorNames	Unspecified	None
References	Unspecified	None
ReferenceNames	Unspecified	None

1293 **8.12 CIM_MemberOfCollection**

1294 Table 9 lists implementation requirements for operations. If implemented, these operations shall be
 1295 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 9, all operations in
 1296 the default list in 8.1 shall be implemented as defined in [DSP0200](#).

1297 NOTE: Related profiles may define additional requirements on operations for the profile class.

1298 **Table 9 – Operations: CIM_MemberOfCollection**

Operation	Requirement	Messages
Associators	Unspecified	None
AssociatorNames	Unspecified	None
References	Unspecified	None
ReferenceNames	Unspecified	None

1299 **8.13 CIM_ElementSettingData**

1300 Table 10 lists implementation requirements for operations. If implemented, these operations shall be
 1301 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 10, all operations
 1302 in the default list in 8.1 shall be implemented as defined in [DSP0200](#).

1303 NOTE: Related profiles may define additional requirements on operations for the profile class.

1304 **Table 10 – Operations: CIM_ElementSettingData**

Operation	Requirement	Messages
Associators	Unspecified	None
AssociatorNames	Unspecified	None
References	Unspecified	None
ReferenceNames	Unspecified	None

1305 **8.14 CIM_OwningCollectionElement**

1306 Table 11 lists implementation requirements for operations. If implemented, these operations shall be
 1307 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 11, all operations
 1308 in the default list in 8.1 shall be implemented as defined in [DSP0200](#).

1309 NOTE: Related profiles may define additional requirements on operations for the profile class.

1310

Table 11 – Operations: CIM_OwningCollectionElement

Operation	Requirement	Messages
Associators	Unspecified	None
AssociatorNames	Unspecified	None
References	Unspecified	None
ReferenceNames	Unspecified	None

1311 **8.15 CIM_ConcreteDependency**

1312 Table 12 lists implementation requirements for operations. If implemented, these operations shall be
 1313 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 12, all operations
 1314 in the default list in 8.1 shall be implemented as defined in [DSP0200](#).

1315 NOTE: Related profiles may define additional requirements on operations for the profile class.

1316

Table 12 – Operations: CIM_ConcreteDependency

Operation	Requirement	Messages
Associators	Unspecified	None
AssociatorNames	Unspecified	None
References	Unspecified	None
ReferenceNames	Unspecified	None

1317 **8.16 CIM_HostedService**

1318 Table 13 lists implementation requirements for operations. If implemented, these operations shall be
 1319 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 13, all operations
 1320 in the default list in 8.1 shall be implemented as defined in [DSP0200](#).

1321 NOTE: Related profiles may define additional requirements on operations for the profile class.

1322

Table 13 – Operations: CIM_HostedService

Operation	Requirement	Messages
Associators	Unspecified	None
AssociatorNames	Unspecified	None
References	Unspecified	None
ReferenceNames	Unspecified	None

1323 **9 Use Cases**

1324 This clause provides informative use cases and object diagrams.

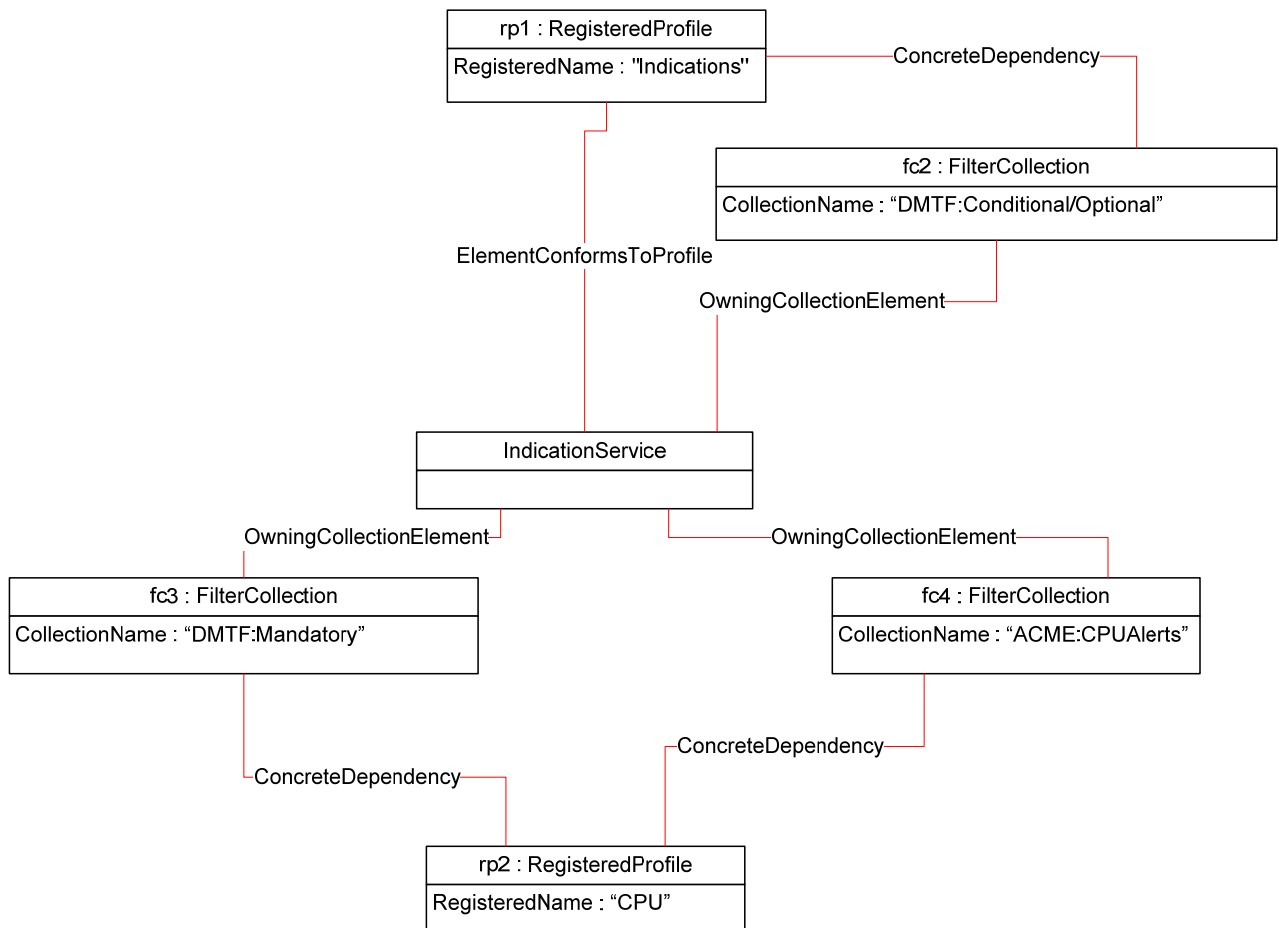
1325 **9.1 Object Diagrams**

1326 For simplicity, the prefix *CIM_* has been removed from the names of the classes.

1327 Figure 3 is an object diagram showing a possible implementation of the profile. In this diagram, the
 1328 optional indications defined are supported. This support is indicated by the existence of fc2 associated

1329 through the CIM_ConcreteDependency instance with rp1. Mandatory indication filters and an optional
 1330 vendor-defined collection of filters are defined for the *CPU Profile* as well. This is indicated by the
 1331 existence of fc3 and fc4 associated with rp2 through the CIM_ConcreteDependency instance.

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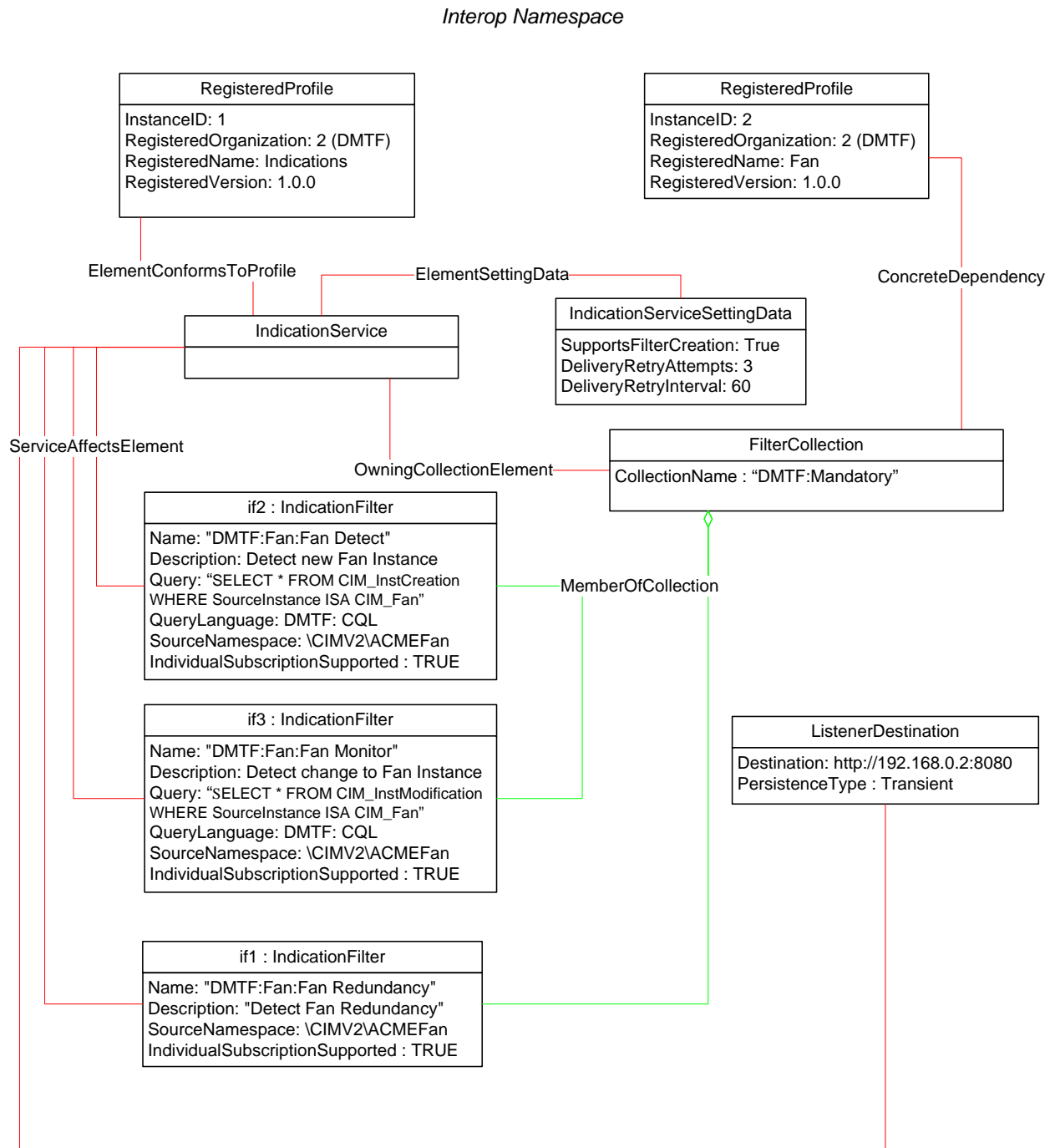


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Figure 3 – Filter Collections Instance Diagram

1336 Figure 4 is an object diagram showing an implementation that supports mandatory indications defined in
 1337 the *Fan Profile*. The implementation has explicitly instantiated instances of CIM_IndicationFilter to
 1338 represent three of the mandatory indication filters. if2 and if3 are filters for lifecycle indications. if1 is a
 1339 filter for alert indications related to changes in the status of fan redundancy.

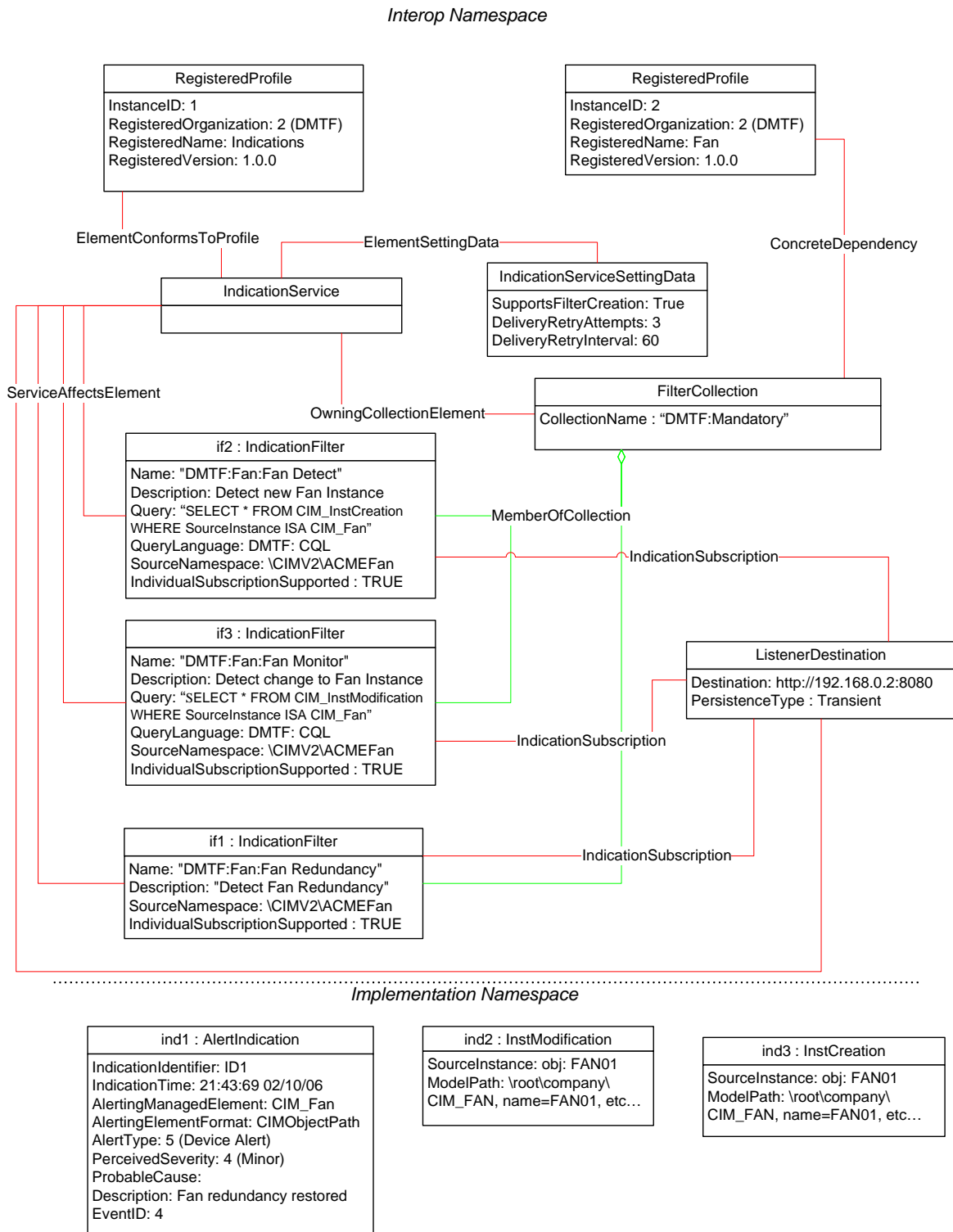


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Figure 4 – Indications Profile Instance Diagram

1342 Figure 5 shows the same implementation as Figure 4 with the addition of individual subscriptions for each
 1343 of the individually modeled indication filters. The three individual indication instances, ind1, ind2, and
 1344 ind3, match these indication filters.

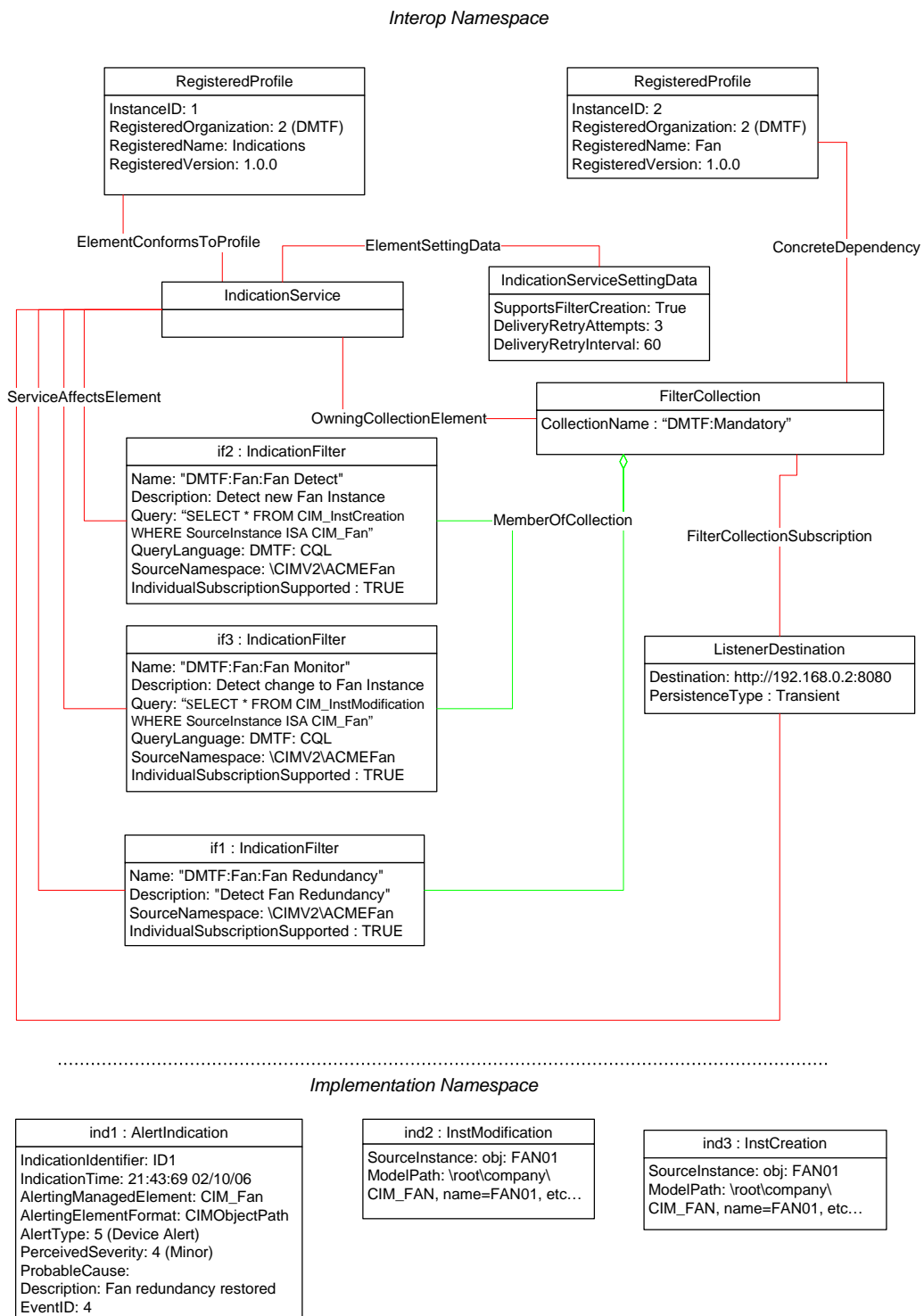


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Figure 5 – Individual Subscriptions

1347 Figure 6 is an object diagram for the same implementation as Figure 4 with the addition of a collection
 1348 subscription. The three individual indication instances, ind1, ind2, and ind3, match the indication filters
 1349 contained in the CIM_FilterCollection instance.

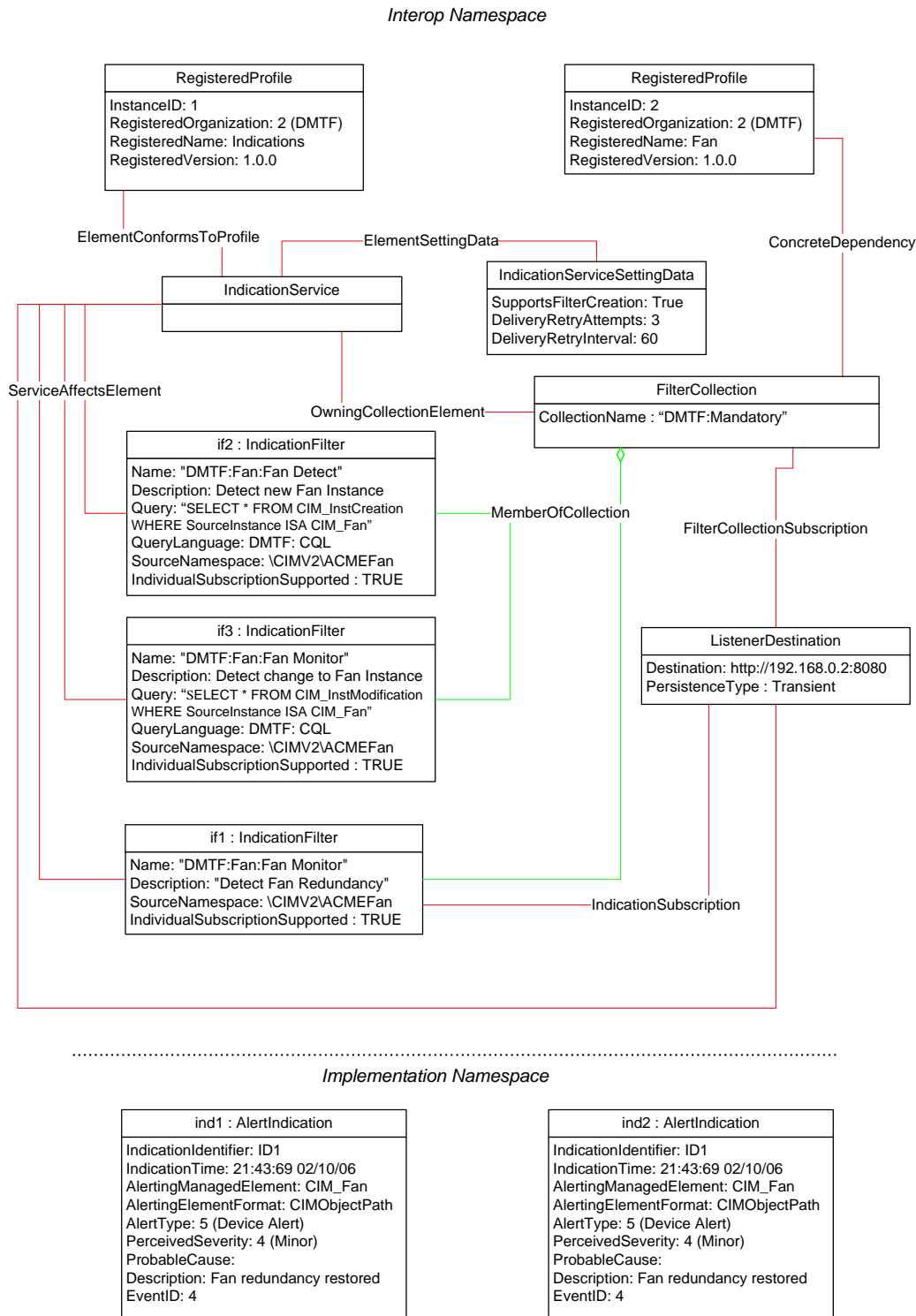


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Figure 6 – Collection Subscription

1352 Figure 7 is an object diagram for the same implementation shown in Figure 4. A subscription has been
 1353 created for the filter collection as well as an individual subscription to if1. This results in the duplicate
 1354 notification ind1 and ind2.

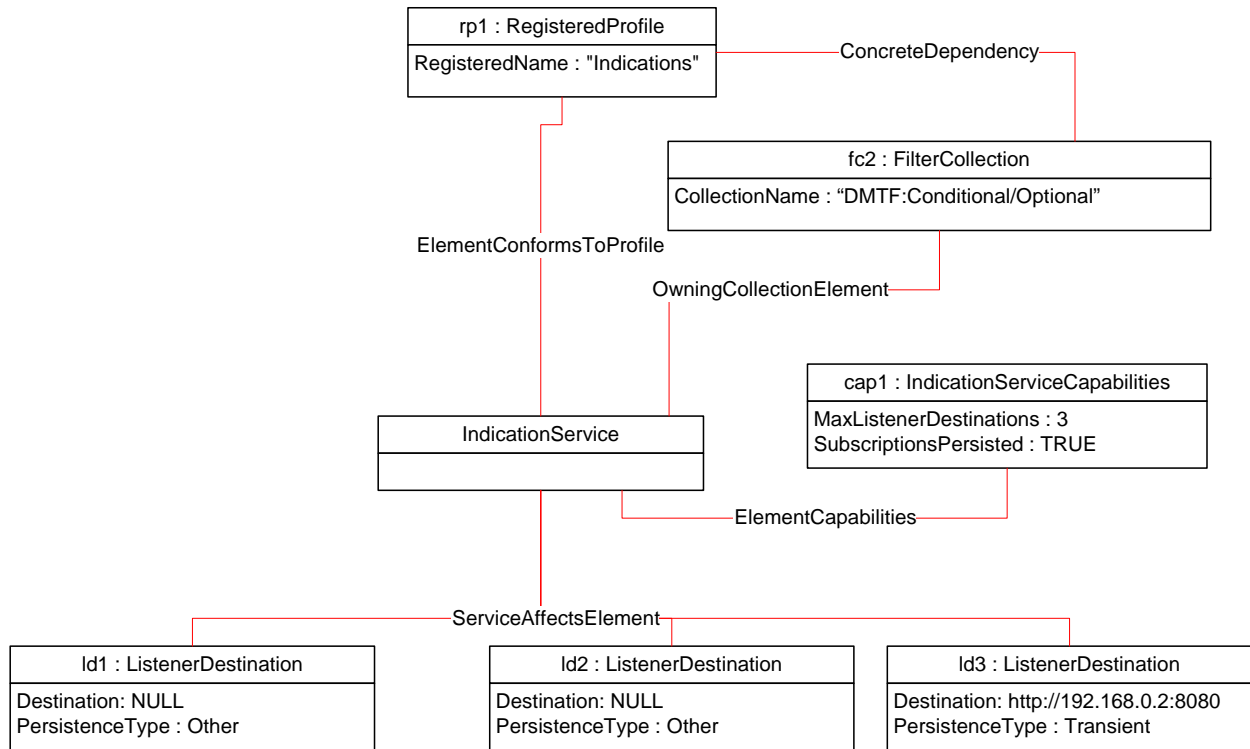


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Figure 7 – Duplicate Subscriptions

1357 Figure 8 is an object diagram for an implementation that supports a fixed number of listener destinations.
 1358 A management client selects one of the existing instances of CIM_ListenerDestination and modifies it
 1359 appropriately to specify a desired destination for indication delivery. The implementation supports three
 1360 listener destinations, which is indicated by the
 1361 CIM_IndicationServiceCapabilities.MaxListenerDestinations property. The implementation statically
 1362 creates instances of CIM_ListenerDestination. Id3 is currently configured to represent a transient listener
 1363 destination. Id1 and Id2 are not configured and could be used by a client to identify desired destinations.



1364

1365

Figure 8 – Statically Provided Listener Destinations

1366 **9.2 Determine Whether Dynamic Filters Are Supported**

1367 Given an instance of CIM_IndicationService, a client can determine if dynamic filters are supported as
 1368 follows:

- 1369 1) Query the CIM_IndicationService.FilterCreationEnabled property. If the property has the value
 1370 True, dynamic filters are supported.
- 1371 2) If the property is False, find the associated instance of CIM_IndicationServiceCapabilities.
- 1372 3) If an instance is found, query the value of the FilterCreationEnabledIsSettable property.
- 1373 4) If FilterCreationEnabledIsSettable is True, modify the CIM_IndicationService, setting the
 1374 FilterCreateEnabled property to True.
- 1375 5) If the modification is successful, creating dynamic filters is supported. If the modification is
 1376 unsuccessful, creating dynamic filters is not supported.

1377 **9.3 Create a Dynamic Filter for Alert Indications**

1378 Given the Owning Entity and Message Identifier for a standard message, a client can create a dynamic
1379 filter for an alert indication as follows:

- 1380 1) Determine if dynamic filter creation is supported using the steps in 9.2.
- 1381 2) If dynamic filter creation is supported, determine the query languages supported for indication
1382 filters using the steps in 9.17.
- 1383 3) Using one of the supported query languages, create an instance of CIM_IndicationFilter in
1384 which the QueryLanguage property identifies one of the supported query languages and the
1385 Query property constrains the CIM_AlertIndication.OwningEntity and
1386 CIM_AlertIndication.MessageId properties to be the desired values.

1387 **9.4 Select a Listener Destination for Delivery of Indications**

1388 Given a destination to which the client wants to have indications delivered, a client can ensure that an
1389 appropriate CIM_ListenerDestination exists, as follows:

- 1390 1) Find all instances of CIM_ListenerDestination that are associated with the
1391 CIM_IndicationService through an instance of CIM_ServiceAffectsElement.
- 1392 2) For each instance of CIM_ListenerDestination, query the Destination property to determine if it
1393 represents the desired destination for indication delivery.

1394 If an instance of CIM_ListenerDestination is not found, the client can use CreateInstance (or an
1395 equivalent operation) to create a new instance of CIM_ListenerDestination for indication delivery by
1396 specifying an appropriate instance of CIM_ListenerDestination as input to the operation.

1397 **9.5 Create a Subscription for a Single Filter**

1398 Given a desired destination for indication delivery and a desired filter, a client can create a subscription
1399 for an indication filter as follows:

- 1400 1) Find all instances of CIM_IndicationFilter that are associated with the CIM_IndicationService
1401 instance through an instance of CIM_ServiceAffectsElement.
- 1402 2) For each instance of CIM_IndicationFilter, evaluate the QueryLanguage and Query properties to
1403 determine if the CIM_IndicationFilter represents the desired indication filter.
- 1404 3) If an instance of CIM_IndicationFilter is found, query the IndividualSubscriptionSupported
1405 property to determine if the server-side implementation supports subscribing to this filter
1406 individually. If the property is True, individual subscription to this filter is supported. If the
1407 property is False, subscription to the individual filter is not supported and a dynamic filter needs
1408 to be created using the steps in 9.3.
- 1409 4) Using the steps in 9.4, select an instance of CIM_ListenerDestination that represents the
1410 desired destination.
- 1411 5) Use CreateInstance (or an equivalent) operation to create an instance of
1412 CIM_IndicationSubscription that references the CIM_IndicationFilter from step 3) and the
1413 CIM_ListenerDestination from step 4).

1414 **9.6 Subscribe for All Mandatory Indications for a Profile**

1415 A client can subscribe for all of the mandatory indications defined for a profile as follows:

- 1416 1) Determine if mandatory indications are supported for the profile.
- 1417 2) If mandatory indications are supported for the profile, use the steps in 9.18 to subscribe to the
1418 CIM_FilterCollection instance that represents the mandatory filters.

1419 9.7 Determine Whether a Subscription Exists for a Given Filter and Destination

1420 A client can determine whether a subscription exists for a particular destination and filter as follows:

- 1421 1) Find all instances of CIM_ListenerDestination that are associated with the
1422 CIM_IndicationService instance through an instance of CIM_ServiceAffectsElement.
- 1423 2) For each instance of CIM_ListenerDestination, if the Destination property identifies the
1424 destination of interest, perform the following steps:
 - 1425 a) Find all instances of CIM_IndicationFilter that are associated with the
1426 CIM_ListenerDestination instance through an instance of CIM_IndicationSubscription.
 - 1427 b) For each instance of CIM_IndicationFilter, if the QueryLanguage and Query properties
1428 match the filter of interest, a subscription exists for the given filter and destination.
 - 1429 c) Find all instances of CIM_FilterCollection that are associated with the
1430 CIM_ListenerDestination instance through an instance of CIM_IndicationFilterSubscription.
 - 1431 d) For each instance of CIM_FilterCollection, evaluate the
1432 CIM_FilterCollection.CollectionName property to determine if the client has knowledge of
1433 filters contained in the collection.
- 1434 3) If the client has knowledge, determine whether the CIM_FilterCollection instance contains the
1435 filter of interest. If it does, a subscription exists for the given filter and destination.
- 1436 4) If the client does not have knowledge, find all instances of CIM_IndicationFilter that are
1437 associated with the CIM_FilterCollection instance through an instance of
1438 CIM_MemberOfCollection. For each instance of CIM_IndicationFilter, if the Query property
1439 matches the filter of interest, a subscription exists for the given filter and destination.

1440 9.8 Determine the Components for Which Lifecycle Indications Are Available

1441 Given an instance of CIM_IndicationFilter that filters for lifecycle indications, a client can determine the
1442 components for which the specified lifecycle indications can be provided, as follows:

- 1443 1) Find the instances of CIM_FilterCollection with which the CIM_IndicationFilter instance is
1444 associated through an instance of CIM_MemberOfCollection.
 - 1445 a) For each instance of CIM_FilterCollection, find the associated instances of
1446 CIM_RegisteredProfile.
 - 1447 b) For each instance of CIM_RegisteredProfile, find the instances of CIM_ManagedElement
1448 that are in the scope of the profile.
 - 1449 c) For each instance of CIM_ManagedElement, determine if it is implemented in a
1450 namespace identified by one of the values of the CIM_IndicationFilter.SourceNamespaces
1451 property, or if it is in the same namespace as the instance of CIM_IndicationFilter.
 - 1452 d) For each instance of CIM_ManagedElement, determine if it matches the query specified by
1453 the QueryLanguage and Query properties of the CIM_IndicationFilter.

1454 If it matches the query, lifecycle indications filtered by the CIM_IndicationFilter are
1455 available for the CIM_ManagedElement instance.
- 1456 2) If the instance of CIM_IndicationFilter is not associated with any instances of
1457 CIM_FilterCollection, determine the namespaces to which the filter applies by querying the
1458 value of the SourceNamespaces property.

1459 If the SourceNamespaces property is empty, the CIM_IndicationFilter applies to the namespace
1460 in which it is instantiated.

1461 If the SourceNamespaces property is not empty, the CIM_IndicationFilter applies to each
1462 identified namespace.

1463 3) For each instance of CIM_ManagedElement, determine if it matches the query specified by the
1464 Query property of the CIM_IndicationFilter. If it matches the query, lifecycle indications filtered by
1465 the CIM_IndicationFilter are available for the CIM_ManagedElement instance.

1466 **9.9 Subscribe for Indications of a Particular Severity**

1467 A client can subscribe for all indications of a particular severity as follows:

1468 Construct a query to select all instances of CIM_AlertIndication in which the PerceivedSeverity property
1469 has the desired value. Use this query as the input in the steps in 9.5.

1470 **9.10 Find the Scoping System for Which an Alert Indication Originated**

1471 Given an instance of CIM_AlertIndication, a client can determine the scoping system for which an
1472 indication originated, as follows:

- 1473 1) Starting with the value of the CIM_AlertIndication.AlertingManagedElement property, retrieve
1474 the CIM element identified.
- 1475 2) Using knowledge of profile definitions that contain the element, determine the profile with which
1476 the CIM element is conformant.
- 1477 3) Use the algorithm defined for the profile to find the Scoping Instance.

1478 **9.11 Remove a Subscription**

1479 Given an instance of CIM_IndicationSubscription that represents an indication subscription, a client can
1480 remove the subscription as follows:

- 1481 1) Invoke the DeleteInstance operation on the instance of CIM_IndicationSubscription.
- 1482 2) If the previously referenced instance of CIM_IndicationFilter was a dynamic filter created by the
1483 client, no other instances of CIM_IndicationSubscription reference it, and the client does not
1484 plan to create a new subscription for this filter, the client can delete the CIM_IndicationFilter.
- 1485 3) If the previously referenced instance of CIM_ListenerDestination was created by the client, no
1486 other instances of CIM_IndicationSubscription or CIM_FilterCollectionSubscription reference it,
1487 and the client does not plan to create a new subscription for this destination, the client can
1488 delete the CIM_ListenerDestination.

1489 **9.12 Remove a Listener Destination**

1490 A client can remove a listener destination as follows:

- 1491 1) Remove each indication subscription configured for the destination by using the steps in 9.11.
- 1492 2) Remove the listener destination by invoking the DeleteInstance operation on the instance of
1493 CIM_ListenerDestination.

1494 **9.13 Determine the Query That Triggered an Alert Indication**

1495 Given an instance of CIM_AlertIndication, a client can determine the indication filter that triggered an
1496 indication to be delivered, as follows:

- 1497 1) Query the value of the CIM_AlertIndication.IndicationFilterName.

1498 If the value of the property identifies an indication filter of which the client has knowledge, the
1499 client knows the filter that caused the indication to be triggered.

1500 If the value of the property does not identify an indication filter of which the client has knowledge, the
1501 client can find the indication filter as follows:

- 1502 a) Use the value of the CIM_AlertIndication.AlertingManagedElement property to find the
1503 WBEM Server from which the indication originated.
- 1504 b) Find the instance of CIM_IndicationService in the Interop Namespace of the WBEM
1505 Server.
- 1506 c) Find all instances of CIM_IndicationFilter that are associated with the
1507 CIM_IndicationService instance through an instance of CIM_ServiceAffectsElement.
- 1508 d) For each instance of CIM_IndicationFilter, determine if the value of the name property
1509 matches the value of the CIM_AlertIndication.IndicationFilterName property.
1510 If it matches, the instance of CIM_IndicationFilter triggered the indication.
1511 If a matching instance of CIM_IndicationFilter is not found, it is not possible for a client to
1512 determine the query.
- 1513 e) Query the value of the CIM_IndicationFilter.Query and
1514 CIM_IndicationFilter.QueryLanguage properties to determine the query that resulted in the
1515 indication.

1516 **9.14 Configure the Number of Retries for Indication Delivery**

1517 A client can configure the number of retries attempted by an indication service as follows:

- 1518 1) Find the instance of CIM_IndicationServiceCapabilities that is associated with the
1519 CIM_IndicationService instance through an instance of CIM_ElementCapabilities.
- 1520 2) Query the value of the CIM_IndicationServiceCapabilities.DeliveryRetryAttemptsIsSettable
1521 property.
 - 1522 1) If the value is True, use ModifyInstance to change the value of the
1523 CIM_IndicationService.DeliveryRetryAttempts to the desired value.
 - 1524 2) If the value is False, the number of retries attempted by the CIM_IndicationService cannot
1525 be changed.

1526 **9.15 Modify a Dynamic Filter**

1527 A client can modify a dynamic filter as follows:

- 1528 1) If the client maintained the object path of the instance of CIM_IndicationFilter that represents
1529 the dynamic filter, the client can invoke the DeleteInstance operation to remove the dynamic
1530 filter.
- 1531 2) If the client has not maintained the object path, the client can find the dynamic filter to replace
1532 as follows:
 - 1533 a) Find all instances of CIM_IndicationFilter that are associated with the
1534 CIM_IndicationService instance through an instance of CIM_ServiceAffectsElement.
 - 1535 b) For each instance of CIM_IndicationFilter, determine if it matches the dynamic filter
1536 previously created.
 - 1537 c) If it matches, attempt to modify the dynamic filter by using the ModifyInstance operation.
 - 1538 d) If the ModifyInstance operation is not supported, invoke the DeleteInstance operation to
1539 remove it.
 - 1540 e) Use the CreateInstance operation, specifying the desired attribute values, to create a new
1541 instance of CIM_IndicationFilter.

- 1542 f) Replicate any CIM_IndicationSubscription instances that referenced the deleted instance
1543 of CIM_IndicationFilter, referencing the newly created CIM_IndicationFilter instance.

1544 **9.16 Filter for Indications from a Specific Namespace**

1545 A client can create a dynamic filter to receive indications from a specific namespace by using the steps in
1546 9.3 with the additional constraint of specifying a value for the CIM_IndicationFilter.SourceNamespaces
1547 property.

1548 **9.17 Determine the Query Language Supported for Filtering Indications**

1549 A client can determine the query languages supported for filtering indications as follows:

- 1550 1) Start with an empty set of supported query languages.
- 1551 2) Find all instances of CIM_IndicationFilter that are associated with the CIM_IndicationService
1552 instance through an instance of CIM_ServiceAffectsElement.
- 1553 3) For each instance of CIM_IndicationFilter, if the value of the
1554 CIM_IndicationFilter.QueryLanguage property is not included in the set from step 1), add it.

1555 NOTE: The supported query languages can alternately be determined through knowledge of the implementation or
1556 through a combination of CIM elements and operations that are outside the scope of this profile.

1557 **9.18 Subscribe to All Events in a Collection**

1558 Given an instance of CIM_FilterCollection that represents a collection of indication filters and a desired
1559 destination for delivery of all indications in the collection, a client can create a subscription to all events in
1560 the collection as follows:

- 1561 1) Select an instance of CIM_ListenerDestination that represents the desired destination by using
1562 the steps in 9.4.
- 1563 2) Given the instance of CIM_ListenerDestination, create a subscription by creating an instance of
1564 CIM_FilterCollectionSubscription by using the CreateInstance operation (or equivalent),
1565 specifying the desired configuration of the subscription and references to the
1566 CIM_ListenerDestination instance and the CIM_FilterCollection instance.

1567 **9.19 Subscribe for All of the Indications Defined in a Profile**

1568 Given an instance of CIM_ListenerDestination that represents a desired destination for indication delivery,
1569 a client can subscribe for all of the indications defined for implementations of a profile, as follows:

- 1570 1) Enumerate instances of CIM_RegisteredProfile in the Interop namespace.
- 1571 2) For each instance of CIM_RegisteredProfile, query the values of the RegisteredName,
1572 RegisteredVersion, and RegisteredOrganization properties to determine if the instance identifies
1573 the profile of interest.
- 1574 3) If the instance of CIM_RegisteredProfile identifies the profile of interest:
 - 1575 a) Find all instances of CIM_FilterCollection that are associated with the
1576 CIM_RegisteredProfile instance through an instance of CIM_ConcreteDependency.
 - 1577 If no instances of CIM_FilterCollection are found, indications are not supported for the
1578 profile.
 - 1579 b) For each instance of CIM_FilterCollection found, determine if it is referenced by an
1580 instance of CIM_MemberOfCollection, where it is the value of the Member reference.
 - 1581 1) If the CIM_FilterCollection instance is the value of the Member reference, find the
1582 CIM_FilterCollection instance that is the value of the Collection reference.

- 1583 • If the CIM_FilterCollection instance that is the value of the Collection reference is
- 1584 not associated with the CIM_RegisteredProfile instance from step 2), create an
- 1585 instance of CIM_FilterCollectionSubscription that references the
- 1586 CIM_FilterCollection instance that is the Member reference and the
- 1587 CIM_ListenerDestination instance that identifies the desired destination.

- 1588 • If the CIM_FilterCollection that is the value of the Collection reference is
- 1589 associated with the CIM_RegisteredProfile instance, skip it.

- 1590 2) If the CIM_FilterCollection is not the value of the Member reference, create an
- 1591 instance of CIM_FilterCollectionSubscription that references the CIM_FilterCollection
- 1592 instance and the CIM_ListenerDestination instance that identifies the desired
- 1593 destination.

1594 **9.20 Determine the Maximum Number of Listener Destinations**

1595 Given an instance of CIM_IndicationService, a client can determine the maximum number of supported
 1596 listener destinations as follows:

- 1597 1) Find the associated instance of CIM_IndicationServiceCapabilities.
 - 1598 2) If an instance is found, query the value of the MaxListenerDestinations property.
- 1599 If an instance is not found, the maximum number of listener destinations is unknown.

1600 **10 CIM Elements**

1601 Table 14 shows the instances of CIM Elements for this profile. Instances of the CIM Elements shall be
 1602 implemented as described in Table 14. Clauses 7 (“Implementation”) and 8 (“Methods”) may impose
 1603 additional requirements on these elements.

1604 **Table 14 – CIM Elements: Indications Profile**

Element Name	Requirement	Description
Classes		
CIM_AlertIndication	Optional	See 10.1.
CIM_ConcreteDependency	Conditional	See 10.2.
CIM_ElementCapabilities	Conditional	See 10.3.
CIM_ElementSettingData	Conditional	See 10.4.
CIM_FilterCollection	Optional	See 10.5.
CIM_FilterCollectionSubscription	Optional	See 10.6.
CIM_HostedService	Mandatory	See 10.7.
CIM_IndicationFilter	Optional	See 10.8.
CIM_IndicationService	Mandatory	See 10.9.
CIM_IndicationServiceCapabilities	Optional	See 7.14 and 10.10.
CIM_IndicationServiceSettingData	Optional	See 7.2 and 10.11.
CIM_IndicationSubscription	Conditional	See 10.12.
CIM_InstCreation	Optional	See 10.13.
CIM_InstDeletion	Optional	See 10.14.
CIM_InstModification	Optional	See 10.15.
CIM_ListenerDestination	Mandatory	See 10.16.

Element Name	Requirement	Description
CIM_MemberOfCollection	Optional	See 10.17.
CIM_OwningCollectionElement	Conditional	See 10.18.
CIM_RegisteredProfile	Mandatory	See 10.19.
CIM_ServiceAffectsElement	Conditional	See 10.20.
Indications		
SELECT * FROM CIM_InstDeletion WHERE SourceInstance ISA CIM_IndicationSubscription	Optional	See 7.17.2.3.
SELECT * FROM CIM_InstDeletion WHERE SourceInstance ISA CIM_FilterCollectionSubscription	Optional	See 7.17.2.4.
SELECT * FROM CIM_InstDeletion WHERE SourceInstance ISA CIM_ListenerDestination	Optional	See 7.17.2.2.

1605 **10.1 CIM_AlertIndication**

1606 CIM_AlertIndication is a specialized type of CIM_Indication that contains information about the severity,
 1607 cause, recommended actions, and other data of a real world event. Profiles that define support for
 1608 asynchronous notification of events can constrain this class and may require it. Table 15 contains the
 1609 requirements for elements of this class.

1610 **Table 15 – Class: CIM_AlertIndication**

Elements	Requirement	Notes
IndicationIdentifier	Mandatory	An identifier for the indication used for correlated indications
IndicationTime	Mandatory	The time and date of creation of the indication. The property may be set to NULL if it cannot be determined.
AlertingManagedElement	Mandatory	The identifying information for the element that changed, as a WBEM-URI-TypedInstancePath (as defined in DSP0207), of the entity for which this Indication is generated
AlertingElementFormat	Mandatory	Matches “WBEMURI”
IndicationFilterName	Mandatory	See 7.15.
AlertType	Mandatory	Primary classification of the indication. This value depends on the content of the alert message and typically should be 5 (Device Alert) or 6 (Environmental Alert) for most hardware-related indications.
PerceivedSeverity	Mandatory	Describes the severity of the alert indication
ProbableCause	Mandatory	None
SystemName	Mandatory	Should be the value of the Name property of the scoping system of the managed element that is the AlertingManagedElement
CorrelatedIndications	Optional	IndicationIdentifiers whose notifications are correlated with this one

Elements	Requirement	Notes
OtherAlertType	Conditional	If AlertType matches 1 (Other), this property is mandatory. Pattern ("+.")
OtherSeverity	Conditional	If PerceivedSeverity matches 1 (Other), this property is mandatory.
ProbableCauseDescription	Conditional	If ProbableCause matches 1 (Other), this property is mandatory.
OwningEntity	Mandatory	See 7.11.
MessageID	Mandatory	See 7.11.
MessageArguments	Mandatory	See 7.11.
Message	Optional	See 7.11.

1611 **10.2 CIM_ConcreteDependency**

1612 CIM_ConcreteDependency is used to associate instances of CIM_FilterCollection to instances of
 1613 CIM_RegisteredProfile. This association identifies the profile that provides context and scope to a
 1614 collection of indication filters. The existence of instances of CIM_ConcreteDependency is conditional on
 1615 the existence of instances of CIM_FilterCollection. Table 16 contains the requirements for elements of
 1616 this class.

1617 **Table 16 – Class: CIM_ConcreteDependency**

Elements	Requirement	Notes
Antecedent	Mandatory	Key: Shall reference the instance of CIM_RegisteredProfile that represents the profile for which the set of indications is supported Cardinality 1
Dependent	Mandatory	Key: Shall reference the instance of CIM_FilterCollection that represents the set of indications supported for this profile Cardinality *

1618 **10.3 CIM_ElementCapabilities**

1619 CIM_ElementCapabilities is used to associate an instance of CIM_IndicationServiceCapabilities with an
 1620 instance of CIM_IndicationService. An instance of CIM_ElementCapabilities is conditional on the
 1621 existence of an instance of CIM_IndicationServiceCapabilities. Table 17 contains the requirements for
 1622 elements of this class.

1623 **Table 17 – Class: CIM_ElementCapabilities**

Elements	Requirement	Notes
ManagedElement	Mandatory	Key: Shall reference the Central Instance Cardinality 1
Capabilities	Mandatory	Key: Shall reference the instance of CIM_IndicationServiceCapabilities that represents the indication service property setting capabilities Cardinality 0..1

1624 **10.4 CIM_ElementSettingData**

1625 CIM_ElementSettingData is used to associate an instance of CIM_IndicationServiceSettingData with an
 1626 instance of CIM_IndicationService. An instance of CIM_ElementSettingData is conditional on the
 1627 existence of an instance of CIM_IndicationServiceSettingData. Table 18 contains the requirements for
 1628 elements of this class.

1629 **Table 18 – Class: CIM_ElementSettingData**

Elements	Requirement	Notes
ManagedElement	Mandatory	Key: Shall reference the instance of CIM_IndicationService that represents the WBEM Server's support for indications Cardinality 1
SettingData	Mandatory	Key: Shall reference the instance of CIM_IndicationServiceSettingData that represents the indication service settings Cardinality 0..1
IsDefault	Mandatory	Matches 1 (Is Default)
IsNext	Mandatory	Matches 1 (Is Next)

1630 **10.5 CIM_FilterCollection**

1631 CIM_FilterCollection represents collections of indication filters. Table 19 contains the requirements for
 1632 elements of this class.

1633 **Table 19 – Class: CIM_FilterCollection**

Elements	Requirement	Notes
InstanceID	Mandatory	Key: Shall specify the unique identifier for an instance of this class within the Implementation namespace
CollectionName	Mandatory	See 7.6.

1634 **10.6 CIM_FilterCollectionSubscription**

1635 CIM_FilterCollectionSubscription is used to associate an instance of CIM_FilterCollection with an instance
 1636 of CIM_ListenerDestination. The existence of an instance of this class reflects the subscription to a
 1637 collection of instances of CIM_IndicationFilter. The association shall imply a subscription to all the
 1638 instances of CIM_IndicationFilter that are members of the collection. Support for this class is conditional
 1639 on support for CIM_FilterCollection. Table 20 contains the requirements for elements of this class.

1640 **Table 20 – Class: CIM_FilterCollectionSubscription**

Elements	Requirement	Notes
Filter	Mandatory	Key: Shall reference the instance of CIM_FilterCollection that represents the set of indications to which a client has subscribed Cardinality *

Elements	Requirement	Notes
Handler	Mandatory	Key: Shall reference the CIM_ListenerDestination that represents the location to which indications shall be delivered when they occur Cardinality *
OnFatalErrorPolicy	Mandatory	See 7.8.
OtherOnFatalErrorPolicy	Conditional	Mandatory if the value of OnFatalErrorPolicy is 1 (Other) Pattern (".+")
FailureTriggerTimeInterval	Mandatory	Specifies minimum delay before OnFatalErrorPolicy is implemented
SubscriptionState	Mandatory	None
OtherSubscriptionState	Conditional	Mandatory if the value of SubscriptionState is 1 (Other) Pattern (".+")
RepeatNotificationPolicy	Mandatory	Matches 2 (None), 3 (Suppress), or 4 (Delay)
RepeatNotificationInterval	Conditional	Mandatory if the value of RepeatNotificationPolicy is 3 (Suppress) or 4 (Delay)
RepeatNotificationGap	Conditional	Mandatory if the value of RepeatNotificationPolicy is 4 (Delay)
RepeatNotificationCount	Conditional	Mandatory if the value of RepeatNotificationPolicy is 3 (Suppress) or 4 (Delay)

1641 **10.7 CIM_HostedService**

1642 CIM_HostedService is used to relate the CIM_IndicationService instance to its scoping CIM_System
1643 instance. Table 21 contains the requirements for elements of this class.

1644 **Table 21 – Class: CIM_HostedService**

Elements	Requirement	Notes
Antecedent	Mandatory	This property shall be a reference to the Scoping Instance. Cardinality 1
Dependent	Mandatory	This property shall be a reference to the Central Instance. Cardinality 1..*

1645 **10.8 CIM_IndicationFilter**

1646 CIM_IndicationFilter represents static and dynamic indication filters. CIM_IndicationFilter is optional. It is
1647 expected that referencing profiles define mandatory instances of CIM_IndicationFilter such that the class
1648 is further constrained to be mandatory in the referencing profile. Table 22 contains the requirements for
1649 elements of this class.

1650

Table 22 – Class: CIM_IndicationFilter

Elements	Requirement	Notes
SystemCreationClassName	Mandatory	Key: Shall be populated by the WBEM Server with the class name of the scoping system. If a value is supplied by the client, it shall be ignored by the WBEM Server.
CreationClassName	Mandatory	Key: Shall be populated by the WBEM Server with the name of the class of which this is an instance. If a value is supplied by the client, it shall be ignored by the WBEM Server.
SystemName	Mandatory	Key: Shall be populated by the WBEM Server with the name of the scoping system. If a value is supplied by the client, it shall be ignored by the WBEM Server.
Name	Mandatory	Key: Shall be populated by the WBEM Server with the unique name of the instance or as specified by profile-defined static filters or by the client application when creating dynamic filters. See 7.4.8.
Query	Mandatory	Specifies the query that defines the filter. See 7.4.6.
QueryLanguage	Mandatory	Specifies the query language used for the filter. See 7.4.6.
SourceNamespaces	Mandatory	Specifies the source namespaces from which indications originate. See 7.4.7.
ElementName	Optional	A user-friendly string that describes the indication. Client modification of this property may or may not be supported.
IndividualSubscriptionSupported	Mandatory	None

1651 **10.9 CIM_IndicationService**

1652 CIM_IndicationService is a component of the WBEM Server Service that represents support for indication
 1653 subscription. This class is the Central Class of the profile. Table 23 contains the requirements for
 1654 elements of this class.

1655

Table 23 – Class: CIM_IndicationService

Elements	Requirement	Notes
SystemCreationClassName	Mandatory	Key
SystemName	Mandatory	Key
CreationClassName	Mandatory	Key
Name	Mandatory	Key
FilterCreationEnabled	Mandatory	See 7.1.
DeliveryRetryAttempts	Mandatory	See 7.1.
DeliveryRetryInterval	Mandatory	See 7.1.
SubscriptionRemovalAction	Mandatory	See 7.1.
SubscriptionRemovalTimeInterval	Mandatory	See 7.1.

1656 **10.10 CIM_IndicationServiceCapabilities**

1657 CIM_IndicationServiceCapabilities is an optional element that represents the capabilities of the
 1658 CIM_IndicationService instance. Table 24 contains the requirements for elements of this class.

1659 **Table 24 – Class: CIM_IndicationServiceCapabilities**

Element	Requirement	Notes
InstanceID	Mandatory	Key: Shall specify the unique identifier for an instance of this class within the Implementation namespace
FilterCreationEnabledIsSettable	Mandatory	Defines whether the client can modify the FilterCreationEnabled property of the associated CIM_IndicationService instance
DeliveryRetryAttemptsIsSettable	Mandatory	Defines whether the client can modify the DeliveryRetryAttempts property of the associated CIM_IndicationService instance
DeliveryRetryIntervalsSettable	Mandatory	Defines whether the client can modify the DeliveryRetryInterval property of the associated CIM_IndicationService instance
SubscriptionRemovalActionIsSettable	Mandatory	Defines whether the client can modify the SubscriptionRemovalAction property of the associated CIM_IndicationService instance
SubscriptionRemovalTimeIntervalsSettable	Mandatory	Defines whether the client can modify the SubscriptionRemovalTimeInterval property of the associated CIM_IndicationService instance
MaxListenerDestinations	Mandatory	Indicates the maximum number of listener destinations
MaxActiveSubscriptions	Mandatory	Indicates the maximum number of active subscriptions
SubscriptionsPersisted	Mandatory	Indicates whether subscriptions are persisted across restarts of the indication service

1660 **10.11 CIM_IndicationServiceSettingData**

1661 CIM_IndicationServiceSettingData is used to represent the initial configuration of the
 1662 CIM_IndicationService instance. Table 25 contains the requirements for elements of this class.

1663 **Table 25 – Class: CIM_IndicationServiceSettingData**

Elements	Requirement	Notes
InstanceID	Mandatory	Key
FilterCreationEnabled	Mandatory	See 7.1.2.
DeliveryRetryAttempts	Mandatory	See 7.1.2.
DeliveryRetryInterval	Mandatory	See 7.1.2.
SubscriptionRemovalAction	Mandatory	See 7.1.2.

Elements	Requirement	Notes
SubscriptionRemovalTimeInterval	Mandatory	See 7.1.2.

1664 **10.12 CIM_IndicationSubscription**

1665 CIM_IndicationSubscription is used to associate an instance of CIM_IndicationFilter with an instance of
 1666 CIM_ListenerDestination. The existence of an instance of this class reflects the subscription to a single
 1667 CIM_IndicationFilter instance. CIM_IndicationSubscription is conditional. Instances of
 1668 CIM_IndicationSubscription may exist if at least one instance of CIM_IndicationFilter is associated with
 1669 the Central Instance through an instance of CIM_ServiceAffectsElement. Table 26 contains the
 1670 requirements for elements of this class.

1671 **Table 26 – Class: CIM_IndicationSubscription**

Elements	Requirement	Notes
Filter	Mandatory	Key: Shall reference the instance of CIM_IndicationFilter that represents the indication to which a client has subscribed
Handler	Mandatory	Key: Shall reference the CIM_ListenerDestination that represents the location to which the indication shall be delivered when it occurs
OnFatalErrorPolicy	Mandatory	None
OtherOnFatalErrorPolicy	Conditional	Mandatory if the value of OnFatalErrorPolicy is 1 (Other) Pattern (".+")
FailureTriggerTimeInterval	Mandatory	Specifies the minimum delay before OnFatalErrorPolicy is implemented
SubscriptionState	Mandatory	None
OtherSubscriptionState	Conditional	Mandatory if the value of SubscriptionState is 1 (Other) Pattern (".+")
RepeatNotificationPolicy	Mandatory	Matches 2 (None), 3 (Suppress), or 4 (Delay)
RepeatNotificationInterval	Conditional	Mandatory if the value of RepeatNotificationPolicy is 4 (Delay)
RepeatNotificationGap	Conditional	Mandatory if the value of RepeatNotificationPolicy is 3 (Suppress) or 4 (Delay)
RepeatNotificationCount	Conditional	Mandatory if the value of RepeatNotificationPolicy is 3 (Suppress) or 4 (Delay)

1672 **10.13 CIM_InstCreation**

1673 CIM_InstCreation notifies a handler when a new instance of a class is created. Referencing profiles that
 1674 require asynchronous notification of instance creation use this class. Table 27 contains the requirements
 1675 for elements of this class.

1676

Table 27 – Class: CIM_InstCreation

Elements	Requirement	Notes
IndicationIdentifier	Mandatory	An identifier for the indication used for correlated indications. The value for this property should be unique for an extended period of time.
IndicationTime	Mandatory	The time and date of creation of the indication. This property shall be populated with a valid datetime value.
SourceInstance	Mandatory	A copy of the instance that changed to generate the indication. SourceInstance contains the current values of the properties selected by the Indication Filter's Query.
SourceInstanceModelPath	Mandatory	The identifying information, as a WBEM-URI-TypedInstancePath (as defined in DSP0207), of the entity for which this Indication is generated
IndicationFilterName	Mandatory	See 7.15.
CorrelatedIndications	Optional	IndicationIdentifiers whose notifications are correlated with this one

1677 **10.14 CIM_InstDeletion**

1678 CIM_InstDeletion notifies a handler when an instance of a class is deleted. Referencing profiles that
 1679 require asynchronous notification of instance deletion use this class. Table 28 contains the requirements
 1680 for elements of this class.

1681

Table 28 – Class: CIM_InstDeletion

Elements	Requirement	Notes
IndicationIdentifier	Mandatory	An identifier for the indication used for correlated indications. The value for this property should be unique for an extended period of time.
IndicationTime	Mandatory	The time and date of creation of the indication. The property shall be populated with a valid datetime value.
SourceInstance	Mandatory	A copy of the instance that changed to generate the indication. SourceInstance contains the current values of the properties selected by the Indication Filter's Query.
SourceInstanceModelPath	Mandatory	The identifying information, as a WBEM-URI-TypedInstancePath (as defined in DSP0207), of the entity for which this Indication is generated
IndicationFilterName	Mandatory	See 7.15.
CorrelatedIndications	Optional	IndicationIdentifiers whose notifications are correlated with this one

1682 **10.15 CIM_InstModification**

1683 CIM_InstModification notifies a handler when an instance (of a class defined in the Filter QueryString) is
 1684 modified or changed. Referencing profiles that require asynchronous notification of instance modification
 1685 use this class. Table 29 contains the requirements for elements of this class.

1686 **Table 29 – Class: CIM_InstModification**

Elements	Requirement	Notes
IndicationIdentifier	Mandatory	An identifier for the indication used for correlated indications. The value for this property should be unique for an extended period of time.
IndicationTime	Mandatory	The time and date of creation of the indication. The property shall be set with a valid datetime value.
SourceInstance	Mandatory	A copy of the instance that changed to generate the indication. SourceInstance contains the current values of the properties selected by the Indication Filter's Query.
SourceInstanceModelPath	Mandatory	The identifying information, as a WBEM-URI-TypedInstancePath (as defined in DSP0207), of the entity for which this Indication is generated
IndicationFilterName	Mandatory	See 7.15.
CorrelatedIndications	Optional	IndicationIdentifiers whose notifications are correlated with this one
PreviousInstance	Optional	A copy of the "previous" instance whose change generated the indication. PreviousInstance contains "older" values of an instance's properties (as compared to SourceInstance), selected by the Indication Filter's Query.

1687 **10.16 CIM_ListenerDestination**

1688 CIM_ListenerDestination represents a destination for the delivery of indications. Table 30 contains the
 1689 requirements for elements of this class.

1690 **Table 30 – Class: CIM_ListenerDestination**

Elements	Requirement	Notes
SystemCreationClassName	Mandatory	Key: Shall be populated by the WBEM Server with the class name of the scoping system. If the client supplies a value, the WBEM Server shall ignore it.
SystemName	Mandatory	Key: Shall be populated by the WBEM Server with the name of the scoping system. If the client supplies a value, the WBEM Server shall ignore it.
CreationClassName	Mandatory	Key: Shall be populated by the WBEM Server with the name of the class of which this is an instance. If the client supplies a value, the WBEM Server shall ignore it.
Name	Mandatory	Key: Shall be populated by the WBEM Server with the unique name of the instance. If the client supplies a value, the WBEM Server shall ignore it
PersistenceType	Mandatory	See 7.5.3.

Elements	Requirement	Notes
ElementName	Mandatory	A user-friendly string that describes the destination. Client modification of this property may or may not be supported.
Destination	Mandatory	See 7.5.2.
ProtocolType	Mandatory	Shall be specified by the client as one of the enumerations from the class definition

1691 **10.17 CIM_MemberOfCollection**

1692 CIM_MemberOfCollection is used to aggregate instances of CIM_IndicationFilter or instances of
 1693 CIM_FilterCollection to an instance of CIM_FilterCollection. This class identifies an indication or collection
 1694 of indications as being part of a specific collection of indications. Table 31 contains the requirements for
 1695 elements of this class.

1696 **Table 31 – Class: CIM_MemberOfCollection**

Elements	Requirement	Notes
Collection	Mandatory	Key: Shall reference an instance of CIM_FilterCollection Cardinality *
Member	Mandatory	Key: Shall reference an instance of CIM_IndicationFilter or CIM_FilterCollection Cardinality *

1697 **10.18 CIM_OwningCollectionElement**

1698 CIM_OwningCollectionElement is used to associate instances of CIM_FilterCollection with an instance of
 1699 CIM_IndicationService. The existence of an instance of CIM_OwningCollectionElement is conditional on
 1700 the existence of an instance of CIM_FilterCollection. Table 32 contains the requirements for elements of
 1701 this class.

1702 **Table 32 – Class: CIM_OwningCollectionElement**

Elements	Requirement	Notes
OwningElement	Mandatory	Key: Shall reference the Central Instance Cardinality 1
OwnedElement	Mandatory	Key: Shall reference an instance of CIM_FilterCollection Cardinality *

1703 **10.19 CIM_RegisteredProfile**

1704 CIM_RegisteredProfile identifies the *Indications Profile* in order for a client to determine whether support
 1705 for indications is supported by the managed system instrumentation. The CIM_RegisteredProfile class is
 1706 defined by the *Profile Registration Profile*. With the exception of the mandatory values specified for the
 1707 elements in Table 33, the behavior of the RegisteredProfile instance is in accordance with the *Profile*
 1708 *Registration Profile*.

1709

Table 33 – Class: CIM_RegisteredProfile

Elements	Requirement	Notes
RegisteredName	Mandatory	This property shall have a value of "Indications".
RegisteredVersion	Mandatory	This property shall have a value of "1.0.0".
RegisteredOrganization	Mandatory	This property shall have a value of 2 (DMTF).

1710 **10.20 CIM_ServiceAffectsElement**

1711 CIM_ServiceAffectsElement is used to associate instances of CIM_IndicationFilter and
 1712 CIM_ListenerDestination with an instance of CIM_IndicationService. The existence of
 1713 CIM_ServiceAffectsElement is conditional on the existence of at least one instance of
 1714 CIM_IndicationFilter, CIM_ListenerDestination, or CIM_FilterCollection. Table 34 contains the
 1715 requirements for elements of this class.

1716

Table 34 – Class: CIM_ServiceAffectsElement

Elements	Requirement	Notes
AffectingElement	Mandatory	Key: Shall reference the Central Instance Cardinality 1
AffectedElement	Mandatory	Key: Shall be a reference to an instance of CIM_IndicationFilter or CIM_ListenerDestination Cardinality *

1717

ANNEX A (informative)

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Profiles That Define Indications

1723 Profiles that define indications document support in the following ways:

- 1724 • Profiles shall define supported events in terms of lifecycle and alert indications within the “CIM
1725 Elements” table of the profile specification.
- 1726 • A row included in the “Related Profiles” table of the “Synopsis” clause that specifies the
1727 *Indications Profile*. The “Relationship” column in the table contains *Mandatory* if mandatory
1728 indications are specified in the profile being defined.
- 1729 • Normative text provided in the “Implementation” clause of the profile being defined, listing the
1730 indications being specified in the profile and in what circumstances they can be produced.
- 1731 • The “CIM Elements” table in the “CIM Elements” clause of the profile being defined contains an
1732 entry for each indication being specified. The entry consists of the query for the indication;
1733 whether it is mandatory, conditional, or optional; and a description of the indication. Additionally,
1734 if a profile requires an instance of CIM_IndicationFilter to be instantiated to represent the
1735 indication, a subclause in Clause 7, “Implementation”, is needed to make this normative
1736 requirement.
- 1737 • CIM_IndicationFilter listed as a mandatory, conditional, or optional class within the profile based
1738 on requirements for static filters. Further each profile specifies, per indication definition, whether
1739 it is required that an implementation instantiate an instance of CIM_IndicationFilter for each
1740 indication definition.
- 1741 • CIM_FilterCollection listed as a mandatory, conditional, or optional class within the profile based
1742 on profile requirements.

1743 NOTE: The requirements for backwards compatibility when applied to the specification of indication filters in a profile
1744 are such that once an indication filter has been defined in a profile, all subsequent minor versions of the profile
1745 continue to specify the indication filter, while a subsequent major version may remove the requirement.

1746

**ANNEX B
(informative)****Change Log**

Version	Date	Description
1.0.0	12/05/2008	Final Release
1.0.1	09/07/2009	Errata Release

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