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Foreword

177 The *Indications Profile* (DSP1054) was prepared by the DMTF WBEM Infrastructure Modeling Working
178 Group.

179 DMTF is a not-for-profit association of industry members dedicated to promoting enterprise and systems
180 management and interoperability.

181

182

Introduction

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

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

189

Indications Profile

190 1 Scope

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

194 2 Normative References

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

198 2.1 Approved References

- 199 DMTF [DSP0200](#), *CIM Operations over HTTP 1.2.0*
200 DMTF [DSP0004](#), *CIM Infrastructure Specification 2.3.0*
201 DMTF [DSP0207](#), *WBEM URI Mapping 1.0.0*
202 DMTF [DSP1001](#), *Management Profile Specification Usage Guide 1.0.0*
203 DMTF [DSP1033](#), *Profile Registration Profile 1.0.0*
204 [IETF, RFC3986](#), Uniform Resource Identifier (URI): Generic Syntax, Jan. 2005,
205 <http://www.ietf.org/rfc/rfc3986.txt>

206 2.2 Other References

- 207 ISO/IEC Directives, Part 2, *Rules for the structure and drafting of International Standards*
208 OMG, *Unified Modeling Language (UML) from the Open Management Group (OMG)*

209 3 Terms and Definitions

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

212 3.1

213 can

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

215 3.2

216 cannot

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

- 218 **3.3**
219 **conditional**
220 indicates requirements to be followed strictly to conform to the document when the specified conditions
221 are met
- 222 **3.4**
223 **mandatory**
224 indicates requirements to be followed strictly to conform to the document and from which no deviation is
225 permitted
- 226 **3.5**
227 **may**
228 indicates a course of action permissible within the limits of the document
- 229 **3.6**
230 **need not**
231 indicates a course of action permissible within the limits of the document
- 232 **3.7**
233 **optional**
234 indicates a course of action permissible within the limits of the document
- 235 **3.8**
236 **referencing profile**
237 indicates a profile that owns the definition of this class and can include a reference to this profile in its
238 "Referenced Profiles" table
- 239 **3.9**
240 **shall**
241 indicates requirements to be followed strictly to conform to the document and from which no deviation is
242 permitted
- 243 **3.10**
244 **shall not**
245 indicates requirements to be followed strictly in order to conform to the document and from which no
246 deviation is permitted
- 247 **3.11**
248 **should**
249 indicates that among several possibilities, one is recommended as particularly suitable, without
250 mentioning or excluding others, or that a certain course of action is preferred but not necessarily required
- 251 **3.12**
252 **should not**
253 indicates that a certain possibility or course of action is deprecated but not prohibited
- 254 **3.13**
255 **bulk subscription**
256 an indication subscription to a filter collection that includes more than one indication filter

- 257 **3.14**
258 **CIM element**
259 CIM classes (including associations), properties (including references), methods, or indications
260 NOTE: For the purpose of this document, CIM qualifiers and schemas are not considered CIM elements.
- 261 **3.15**
262 **deprecated**
263 indicates that an element or profile behavior has been outdated by newer constructs
264 NOTE: Deprecated elements may become obsolete in future versions of the profile. Authors should avoid using
265 deprecated elements and attributes. Server implementations should continue to support deprecated elements for
266 backward compatibility.
- 267 **3.16**
268 **dynamic filter**
269 an instance of CIM_IndicationFilter that is created by a client application at runtime
270 These instances may come and go depending on the client application.
- 271 **3.17**
272 **event**
273 the occurrence of a phenomenon of interest to a management application
274 Events are not published in CIM directly but may be represented by a model change or the instantiation of
275 a CIM_Indication subclass.
- 276 **3.18**
277 **indication**
278 the communication and record of the detection of an event of interest
279 The indication may only represent an aspect of the event and not the entire event. Multiple indications
280 may be communicated for a specific event.
- 281 **3.19**
282 **indication filter**
283 a logical construct that specifies a filter on indications, used to control whether indications are delivered to
284 a subscriber
- 285 **3.20**
286 **match**
287 (CIM property values) indicates that a property is equal to one or more values
- 288 **3.21**
289 **obsolete**
290 indicates that an item was defined in prior standards but has been removed from this standard
- 291 **3.22**
292 **organization**
293 consortium, standards group, or company creating a DMTF profile specification
- 294 **3.23**
295 **pattern**
296 (CIM property values) supplied pattern that the value of a property shall follow

- 297 **3.24**
298 **query**
299 a filter to constrain the events for which indications are generated
- 300 **3.25**
301 **static filter**
302 an instance of CIM_IndicationFilter that is created by a profile implementation at load time
303 These instances usually do not change.
- 304 **3.26**
305 **subscribe**
306 the mechanism whereby a client registers for delivery of indications
- 307 **3.27**
308 **WBEM Server**
309 a Web Based Enterprise Management (WBEM) implementation that provides Web-based management
310 functionality that conforms to a set of management and Internet standard technologies developed to unify
311 the management of distributed computing environments.

312 **4 Symbols and Abbreviated Terms**

- 313 **4.1**
314 **CQL**
315 CIM Query Language

- 316 **4.2**
317 **QoS**
318 Quality of service

- 319 **4.3**
320 **URI**
321 Uniform Resource Identifier

- 322 **4.4**
323 **WBEM**
324 Web Based Enterprise Management

325

- 326 **4.5**
327 **Experimental Maturity Level**
328

329 Some of the content considered for inclusion in *Indications Profile* has yet to receive sufficient review to
330 satisfy the adoption requirements set forth by the Technical Committee within the DMTF. This content is
331 presented here as an aid to implementers who are interested in likely future developments within this
332 specification. The content marked experimental may change as implementation experience is gained.
333 There is a high likelihood that it will be included in an upcoming revision of the specification. Until that
334 time, it is purely informational, and is clearly marked within the text.

335
336 A sample of the typographical convention for experimental content is included here:

337

338 **EXPERIMENTAL**

339
340 Experimental content appears here

341
342 **EXPERIMENTAL**

343

344 **5 Synopsis**

345 **Profile name:** *Indications*

346 **Version:** *1.0.0*

347 **Organization:** DMTF

348 **CIM schema version:** 2.16

349 **Central Class:** CIM_IndicationService

350 **Scoping Class:** CIM_System

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

355 The Central Instance of this profile shall be an instance of CIM_IndicationService. The Scoping Instance
356 shall be the instance of CIM_System with which the Central Instance is associated through
357 CIM_HostedService.

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

359 **Table 1 – Referenced Profiles**

Profile Name	Organization	Version	Relationship	Behavior
<i>Profile Registration Profile</i> (DSP1033)	DMTF	.0	Mandatory	See 10.19.

360 **6 Description**

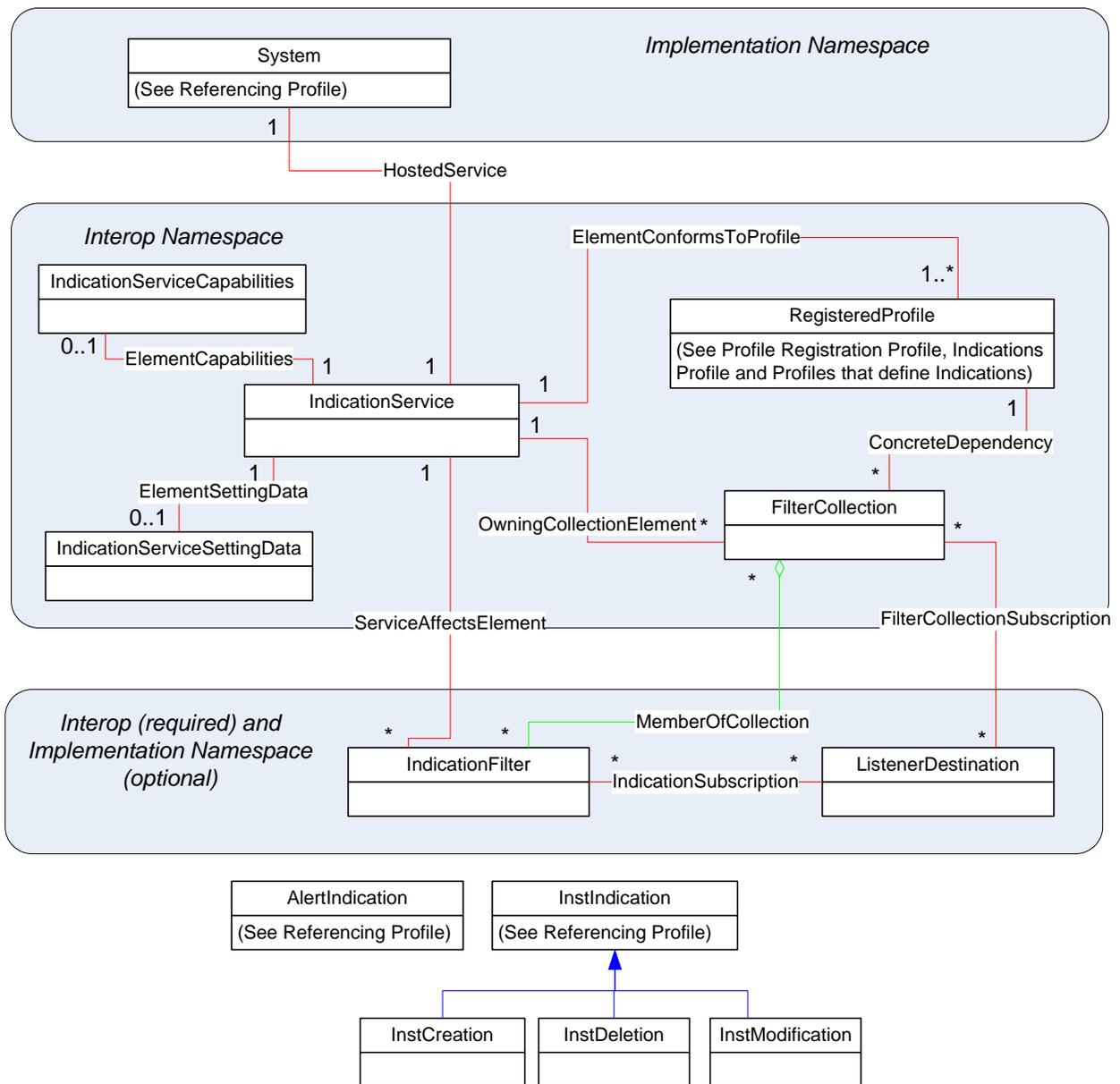
361 The *Indications Profile* describes the necessary properties and methods to describe the indications
362 supported by managed elements and how a client subscribes to those indications.

363 **6.1 Overview of Profile Elements**

364 An event is some phenomenon of interest. An indication is an observation of characteristics of that event.
365 For example, an event could be the fact that your house caught fire. An indication could report the fact

- 366 that smoke or heat is observed, which are, as observer knows, the consequence of the fire. Alternatively,
367 the indication may report that your house has caught fire.
- 368 Since CIM report many characteristics of management elements in several classes and an event is likely
369 to change several instances and properties, a change to any instance reports some of the characteristics
370 of the event. As such, any given life cycle indication reports observations.
- 371 AlertIndications instances are capable to reporting the event directly whether or not any characteristics of
372 the event are modeled by an implementation. As such, an AlertIndication can report the event directly, but
373 may not be able to convey any observations of the effect of the event.
- 374 Figure 1 represents the UML class diagram for the *Indications Profile*. For better clarity and
375 understanding, see [DSP1033](#) for information about profile registration and namespaces.

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



377

378

Figure 1 – Indications Profile: Class Diagram

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

383 CIM_IndicationService represents the ability of the server-side implementation to support the delivery of
 384 indications. If the *Indications Profile* is implemented, there is exactly one instance of
 385 CIM_IndicationService.

386 CIM_IndicationServiceCapabilities is an optional element that represents the capabilities of the
387 CIM_IndicationService.

388 CIM_IndicationServiceSettingData is an optional element that is used to model the initial configuration of
389 the CIM_IndicationService.

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

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

398 CIM_ListenerDestination represents the location and method of delivering an indication to the client that
399 may be subscribed to one or more indication filters. The Destination address in the
400 CIM_ListenerDestination may be different that the network address of the client that created the
401 subscription.

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

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

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

408 CIM_MemberOfCollection may be used to aggregate instances of CIM_IndicationFilter into one or more
409 instances of CIM_FilterCollection.

410 CIM_OwningCollectionElement is used to scope instances of CIM_FilterCollection to the instance of
411 CIM_IndicationService.

412 **6.2 Client Indication Subscriptions**

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

416 **6.2.1 Creating a Subscription**

417 A client implements three steps to subscribe for indications:

- 418 1. Determine if there is an existing indication filter for the subscription. The indication filter may be
419 explicitly modeled with an instance of CIM_IndicationFilter or implicitly represented by a
420 CIM_FilterCollection that is defined to contain the indication filter. If an appropriate indication filter
421 does not exist, and dynamic filters are supported, the client can create a dynamic filter.
- 422 2. Determine if the desired destination is already covered by looking for an instance of
423 CIM_ListenerDestination that represents the destination. If one does not exist, the client may
424 create one.
- 425 3. Create an instance of CIM_IndicationSubscription or CIM_FilterCollectionSubscription between
426 the CIM_ListenerDestination and CIM_IndicationFilter or CIM_FilterCollection.

427 6.2.2 Bulk Subscriptions

428 A bulk subscription is a single subscription that encompasses one or more indication filters. Bulk
429 subscriptions are implemented as an instance of CIM_FilterCollectionSubscription that associates an
430 instance of CIM_ListenerDestination to an instance of CIM_FilterCollection. Subscribing to a filter
431 collection is equivalent to individually subscribing to each indication filter in the collection and results in an
432 indication being sent for every indication filter triggered by an event.

433 6.2.3 Recursive Subscriptions

434 An instance of CIM_FilterCollection implicitly contains indication filters that may be represented explicitly
435 by instances of CIM_IndicationFilter. An instance of CIM_FilterCollection may contain additional
436 CIM_FilterCollection instances. Subscription to a CIM_FilterCollection instance is interpreted as a single
437 subscription to all contained indication filters and all contained instances of CIM_FilterCollection. Thus, if
438 the same destination is explicitly subscribed to an instance of CIM_FilterCollection and is also explicitly
439 subscribed to a contained instance of CIM_IndicationFilter or CIM_FilterCollection, the destination can
440 receive duplicate notifications.

441 6.2.4 Subscriptions whose Filter Semantics Overlap

442 The same indication destination may be represented with more than one instance of
443 CIM_ListenerDestination. The filter semantics between to subscriptions may overlap. The same indication
444 filter may be represented multiple times. It may be represented explicitly by more than one instance of
445 CIM_IndicationFilter or implicitly by one or more CIM_FilterCollection instances. This potential overlap
446 makes it possible for more than one subscription to cause a particular indication to be delivered to a
447 particular destination. The server-side implementation does not perform any crosschecking to prevent the
448 delivery of overlapping indications. Therefore, it is the responsibility of a client to ensure that the
449 subscriptions they create does not result in overlapping filters for the same destination. It is the
450 responsibility where the same indication can be produced from multiple indication filters.

451 6.2.5 Dynamic Contents of Filter Collections

452 A subscription to a CIM_FilterCollection instance is interpreted as a subscription to the filters contained
453 within the collection. Although the indication filters implicitly contained in the collection do not change, it is
454 possible that the indication filters explicitly contained (CIM_IndicationFilter or nested CIM_FilterCollection
455 instances) may change. A snapshot of the contained filters at the time of the creation of the subscription
456 is not maintained. Therefore, as the contents of the CIM_FilterCollection instance change, the set of filters
457 to which the subscription actually applies may change.

458 6.3 Indication Filters

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

463 6.3.1 Filter Query

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

467 The query defines the model changes or events that are being listened for. The query may define the
468 model properties sent with the indication. A query also defines the source classes for the properties and
469 what logic is used to combine the instances. A query is defined using the rules of a query language, like

470 CIM Query Language (CQL). Profiles that define indications specify the exact string that represents the
471 filter query.

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

473 EXAMPLE 1: "SELECT * FROM CIM_AlertIndication" – This query statement specifies that all supported
474 properties of the CIM_AlertIndication instance can be delivered to clients that have subscribed to this indication
475 when such an event occurs.

476 EXAMPLE 2: "SELECT * FROM CIM_InstCreation WHERE SourceInstance ISA CIM_StorageVolume" – This
477 query statement specifies that all supported properties of the CIM_InstCreation instance can be delivered to
478 clients and the CIM_InstCreation instance shall be delivered when the value of the SourceInstance property is an
479 instance of CIM_StorageVolume.

480 6.3.2 Static Filters

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

- 484 • **Mandatory Indication Filter**

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

- 487 • **Optional Indication Filter**

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

- 489 • **Conditional Indication Filter**

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

- 492 • **Vendor Defined Indication Filter**

493 An implementation may support instances of CIM_IndicationFilter that are not defined by a
494 profile.

495 6.3.3 Dynamic Filters

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

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

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

509 6.4 Filter Collections

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

511 6.4.1 General

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

515 A client may subscribe to a filter collection directly. A subscription to a filter collection is recursively a
516 subscription to all of the indication filters defined in the collection and any aggregated filter collections. An
517 indication filter that is contained in a collection need not be explicitly modeled with an instance of
518 CIM_IndicationFilter and associated through an instance of CIM_MemberOfCollection to the
519 CIM_FilterCollection instance for the client to receive indications matching the filter. If a client is
520 subscribed to a filter collection, for a given event the client can receive a discrete indication for each
521 indication filter in the collection the event matches.

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

526 Filter collections defined in a profile are associated with the instance of CIM_RegisteredProfile that
527 represents the profile through an instance of CIM_ConcreteDependency. An instance of
528 CIM_FilterCollection is associated with the instance of CIM_IndicationService through an instance of
529 CIM_OwningCollectionElement.

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

533 6.5 When to Instantiate CIM_IndicationFilter

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

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

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

- 546 • To enable a client application that does not have a priori knowledge of the indication filters
547 specified by a profile to determine the indication filters supported for implementations of the
548 profile
- 549 • To enable a client to subscribe to individual filters instead of all filters in a collection

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

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

557 **6.6 Listener Destinations**

558 A few implementation paradigms may be supported by an implementation for management of listener
559 destinations. An implementation may support listener destination management through creation and
560 deletion of instances of CIM_ListenerDestination. Alternately, an implementation may statically create
561 instances of CIM_ListenerDestination and support the specification of desired destinations through
562 modification of the instance of CIM_ListenerDestination. Implementations may support a hybrid model, in
563 which they allow creation, modification, and deletion of instances of CIM_ListenerDestination. If an
564 implementation statically creates instances of CIM_ListenerDestination and supports client modification,
565 the CIM_ListenerDestination.Destination property should be NULL until it is modified by a client. If a client
566 wants to indicate that a CIM_ListenerDestination is no longer in use, and is available to be used to specify
567 a new destination, the client should set the value of the CIM_ListenerDestination.Destination property to
568 NULL.

569 **6.7 Indication Service**

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

572 Various aspects of the service behavior are modeled, including

- 573 • support for client-instantiated filters
- 574 • definition of indication delivery retry attempts
- 575 • definition of indication delivery retry intervals
- 576 • support for subscription removal action
- 577 • definition of the subscription removal time interval

578 **6.7.1 CIM_IndicationService.FilterCreationEnabled**

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

583 **6.7.2 CIM_IndicationService.DeliveryRetryAttempts**

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

588 **6.7.3 CIM_IndicationService.DeliveryRetryInterval**

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

593 **6.7.4 CIM_IndicationService.SubscriptionRemovalAction**

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

598 **6.7.5 CIM_IndicationService.SubscriptionRemovalTimeInterval**

599 The SubscriptionRemovalTimeInterval property defines the minimum time between two failed indication
 600 deliveries without any successful indication deliveries in between before the SubscriptionRemovalAction
 601 goes into effect.

602 **6.7.6 CIM_IndicationServiceSettingData**

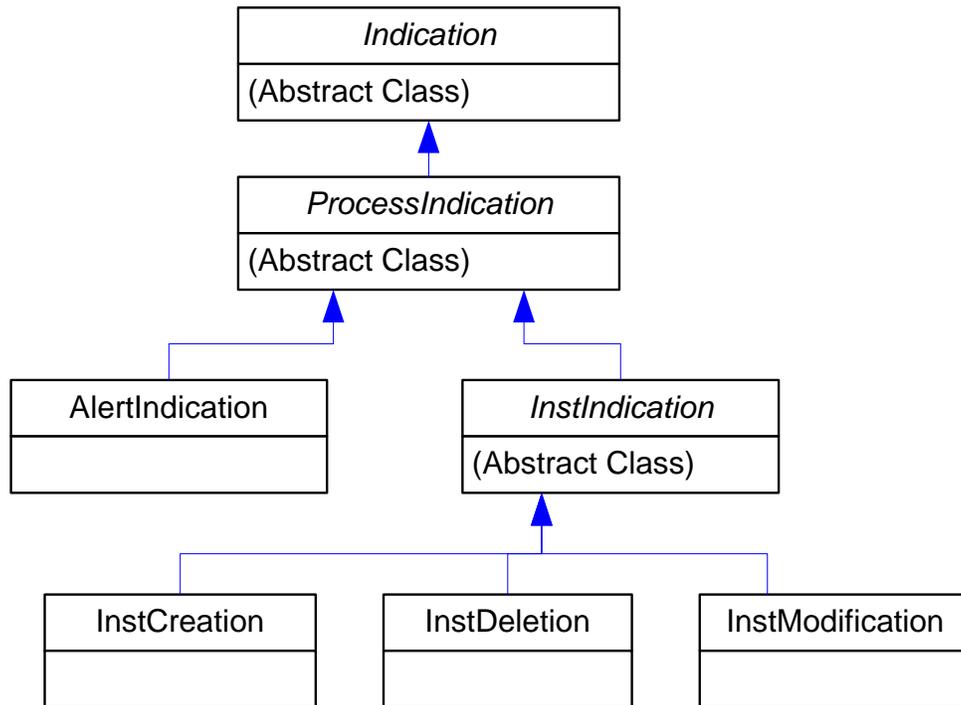
603 The CIM_IndicationServiceSettingData class represents the configuration settings for the
 604 CIM_IndicationService class.

605 **6.8 Indication Types and Processing**

606 The two types of indications are

- 607 • lifecycle indications
- 608 • alert indications

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



611

612

Figure 2 – Indication Class Diagram

613 **6.8.1 Lifecycle Indications**

614 Lifecycle indications are indications that provide notification of changes in the lifecycle of CIM instances
 615 and CIM class definitions. Only lifecycle indications related to changes in CIM instances are within the
 616 scope of this profile. Lifecycle indications related to changes in CIM instances are reported using
 617 instances of CIM_InstCreation, CIM_InstDeletion, or CIM_InstModification. They are used to convey
 618 changes in the model that reflect observations of changes in the managed element.

619 **6.8.2 Alert Indications**

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

622 **6.9 Subscription Management Authorization**

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

627 **7 Implementation**

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

631 **7.1 CIM_IndicationService**

632 CIM_IndicationService represents a component of the WBEM Server Service that represents support for
633 indication subscription.

634 **7.1.1 General Requirements**

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

636 **7.1.2 Profile Default Configuration**

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

- 641 • DeliveryRetryAttempts matches 3.
- 642 • DeliveryRetryInterval matches 20.
- 643 • SubscriptionRemovalAction matches 2 (Remove).
- 644 • SubscriptionRemovalTimeInterval matches 2,592,000.

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

646 **7.2 CIM_IndicationServiceSettingData (Optional)**

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

650 **7.3 Indication Filters**

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

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

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

658 **7.4 CIM_IndicationFilter**

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

664 **7.4.1 General Requirements**

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

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

672 Instantiation of a CIM_IndicationFilter may be initiated either by the implementation or by a client
673 application.

674 Each instance of CIM_IndicationFilter shall be associated with exactly one instance of
675 CIM_IndicationService through an instance of CIM_ServiceAffectsElement.

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

679 If the CIM_IndicationFilter.IndividualSubscriptionSupported property has the value True, the instance of
680 CIM_IndicationFilter may be associated with one or more instances of CIM_ListenerDestination through
681 an instance of CIM_IndicationSubscription. If the CIM_IndicationFilter.IndividualSubscriptionSupported
682 property has the value False, the instance of CIM_IndicationFilter shall not be associated with any
683 instances of CIM_ListenerDestination through an instance of CIM_IndicationSubscription.

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

687 **7.4.2 Indication Filter Validity**

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

- 689 • The value of the QueryLanguage property identifies a query language supported by the
690 indication service.
- 691 • The value of the Query property is well formed according to the supported query language.
692 LifeCycle Indication Filters shall include a WHERE clause.
- 693 • The server-side implementation is capable of producing indications that are selected by the
694 filter.

695 **7.4.3 Static Filter Creation**

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

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

705 If an instance of CIM_IndicationFilter represents a static filter that is mandatory in the defining profile, it
706 shall be associated through an instance of CIM_MemberOfCollection with the instance of
707 CIM_FilterCollection that is implemented as defined in 7.6. If an instance of CIM_IndicationFilter
708 represents a static filter that is optional or conditional in the defining profile, it shall be associated through
709 an instance of CIM_MemberOfCollection with the instance of CIM_FilterCollection that is implemented as
710 defined in 7.6.

711 **7.4.4 Dynamic Filter Creation**

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

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

716 **7.4.5 Subscribing to Dynamic Filters**

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

720 **7.4.6 CIM_IndicationFilter.Query**

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

724

725 **EXPERIMENTAL**

726 **7.4.7 CIM_IndicationFilter.SourceNamespaces**

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

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

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

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

739 **EXPERIMENTAL**

740

741

742 **7.4.8 CIM_IndicationFilter.Name**

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

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

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

748 where

749 <RegisteredName> is the value assigned by the defining profile to the
750 CIM_RegisteredProfile.RegisteredName property for the instance of CIM_RegisteredProfile that is
751 used to advertise implementation of the profile.

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

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

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

762 **7.5 CIM_ListenerDestination**

763 CIM_ListenerDestination represents a destination for the delivery of indications.

764 **7.5.1 General Requirements**

765 On a create instance request, an instance of CIM_ListenerDestination shall be created in the namespace
766 specified in the request. If the specified namespace is not the interop namespace, an additional instance
767 of CIM_ListenerDestination shall be created in the interop namespace. Each such instance shall have the
768 same keys.

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

771 Instantiation of a CIM_ListenerDestination may be initiated either by the implementation or by a client
772 application.

773 Each instance of CIM_ListenerDestination shall be associated with exactly one instance of
774 CIM_IndicationService through an instance of CIM_ServiceAffectsElement.

775 Any instance of CIM_ListenerDestination may be associated with one or more instances of
776 CIM_IndicationFilter through an instance of CIM_IndicationSubscription, with one or more instances of
777 CIM_FilterCollection through an instance of CIM_FilterCollectionSubscription, or both.

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

781 **7.5.2 CIM_ListenerDestination.Destination**

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

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

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

793 A client may choose to set the value of the PersistenceType property to 3 (Transient) to indicate to the
794 WBEM Server that the delivery destination for the subscribed indications is short-lived (for example, a
795 task progress meter in a graphical management application). Instances of CIM_ListenerDestination that
796 have the PersistenceType property set to 3 (Transient) shall be deleted if the WBEM Server cannot
797 deliver a subscribed indication to the client destination (based on the
798 CIM_IndicationServiceSettingData.DeliveryRetryAttempts property). All instances of
799 CIM_IndicationSubscription or CIM_FilterCollectionSubscription that reference the instance of
800 CIM_ListenerDestination shall be deleted as well.

801 **7.6 CIM_FilterCollection**

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

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

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

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

808 **7.6.1 Relationship with Indication Service**

809 Every instance of CIM_FilterCollection shall be associated with exactly one instance of
810 CIM_IndicationService through an instance of CIM_OwningCollectionElement.

811 **7.6.2 Nested Filter Collections**

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

814 7.6.3 Relationship with Registered Profile

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

820 7.6.4 CIM_FilterCollection.CollectionName

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

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

825 "DMTF:" <unique identifier>

826 where:

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

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

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

837 7.7 WBEM Server Requirements

838 WBEM Server may support indications. However, if a WBEM Server supports indications, the WBEM
 839 Server shall

- 840 • Instantiate a single instance of CIM_IndicationService
- 841 • Support the indications of the *Indications Profile* as specified in the CIM Elements table in
 842 Clause 10
- 843 • Support the ability to subscribe for indications using the classes defined in the *Indications*
 844 *Profile*
- 845 • Support indication filters in the Interop namespace
- 846 • support indications as defined in profiles that are advertised as implemented in the Interop
 847 namespace

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

850 7.8 CIM_IndicationSubscription

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

854 listed in the corresponding CIM_IndicationFilter instance found in the Interop namespace a corresponding
855 instance of CIM_IndicationSubscription should be instantiated between the corresponding
856 CIM_IndicationFilter instance in the source namespace and the associated CIM_ListenerDestination
857 instance in that same namespace if it exists.

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

860 Instantiation of a CIM_IndicationSubscription may be initiated either by the implementation or by a client
861 application.

862 **7.8.1 CIM_IndicationSubscription.OnFatalErrorPolicy**

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

869 **7.8.2 CIM_IndicationSubscription.RepeatNotificationPolicy**

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

876 The use of the RepeatNotificationCount, RepeatNotificationInterval, and RepeatNotificationGap
877 properties defined in the CIM_IndicationSubscription class depends on the value of the
878 RepeatNotificationPolicy property.

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

- 881 • 2 (None)
- 882 • 3 (Suppress)
- 883 • 4 (Delay)

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

889 **7.8.2.1 RepeatNotificationPolicy = None**

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

892 **7.8.2.2 RepeatNotificationPolicy = Suppress**

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

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

899 **7.8.2.3** RepeatNotificationPolicy = Delay

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

906 **7.9 CIM_FilterCollectionSubscription**

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

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

911 Instantiation of a CIM_FilterCollectionSubscription may be initiated either by the implementation or by a
912 client application.

913 **7.10 Indication Delivery**

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

923 Instances of CIM_ListenerDestination that have PersistenceType property set to 3 (Transient) shall be
924 deleted if the WBEM Server cannot deliver a subscribed indication to the client destination (based on the
925 CIM_IndicationServiceSettingData.DeliveryRetryAttempts property). All instances of the
926 CIM_IndicationSubscription or CIM_FilterCollectionSubscription associations that reference the instance
927 of CIM_ListenerDestination shall be deleted as well, unsubscribing the transient client from the
928 indications.

929 **7.11 Using Message Registries**

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

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

- 937 • The MessageID property shall contain the message identifier from the registry.
- 938 • The OwningEntity property shall contain the identifier of the organization that defined the
939 registry.

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

943 7.12 Indication Subscription Removal

944 The WBEM Server may remove an indication subscription if the delivery destination (that is,
945 CIM_ListenerDestination.Destination) cannot be reached within the number of delivery retry attempts and
946 the retry interval specified in the CIM_IndicationServiceSettingData instance's DeliveryRetryAttempts and
947 DeliveryRetryInterval properties. The removal of an indication subscription is governed by the
948 CIM_IndicationService.SubscriptionRemovalAction property value. If the SubscriptionRemovalAction
949 property has a value of 2 (Remove), the subscription shall be removed after two failed indication
950 deliveries occur without any successful indication deliveries in between and with the time between the
951 deliveries exceeding the timeout specified in the CIM_IndicationService.SubscriptionRemovalTimeInterval
952 property.

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

958 7.13 Implementation of Profile Specifications

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

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

963 7.14 CIM_IndicationServiceCapabilities

964 An instance of CIM_IndicationServiceCapabilities shall be instantiated when the implementation supports
965 the direct modification of any properties of the indication service. The CIM_IndicationServiceCapabilities
966 instance shall be associated with the affected instance of CIM_IndicationService through an instance of
967 CIM_ElementCapabilities. If the implementation does not support the direct modification of any properties
968 on the indication service, the implementation may not instantiate an instance of
969 CIM_IndicationServiceCapabilities. The absence of an instance of CIM_IndicationServiceCapabilities
970 associated with the CIM_IndicationService indicates that modification of properties of the
971 CIM_IndicationService by a client is not supported.

972 7.15 Indication.IndicationFilterName Property

973 At the time of the creation of an indication, an implementation may not have the information about the
974 indication filters and/or filter collections that match the created indication. After the creation of the
975 indication, the information about the indication filters and/or filter collections that matched the indication
976 becomes known. Before the delivery of the indication, the information about all the matched indication
977 filters shall be included in the IndicationFilterName property. The IndicationFilterName property contains
978 the indication filter names (values of property CIM_IndicationFilter.Name) for the indication that matched
979 the indication filters listed in this array. For each active subscription to each of the matched indication
980 filters and/or filter collections, the indication shall be delivered. A management client may use this
981 property to match the indication received with semantics known a priori by the client. A management
982 profile ought to list the indications that a profile implementation can produce and why. A client
983 implementation of this profile uses this property to determine what indication was produced, as
984 documented in the profile, and why.

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

989 **7.16 Advertising Profile Conformance**

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

992 **7.17 Indications for the Indications Profile**

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

994 **7.17.1 Mandatory Indications**

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

997 **7.17.2 Conditional and Optional Indications**

998 This clause describes the requirements for conditional and optional indications for implementations of the
999 Indications Profile.

1000 **7.17.2.1 Conditional/Optional Filter Collection**

1001 There may be an instance of CIM_FilterCollection in which the CIM_FilterCollection.CollectionName
1002 property has the value "DMTF:Indications:Conditional/Optional".

1003 **7.17.2.2 Listener Destination Removal**

1004 There may be an indication filter as defined in this clause. Subscribers to this indication filter can be
1005 informed when a listener destination is deleted.

1006 **7.17.2.2.1 Indication Filter Name**

1007 The indication filter name shall be "DMTF:Indications:ListenerDestinationRemoval".

1008 **7.17.2.2.2 Filtered Events**

1009 The indication filter shall filter for notification of the deletion of instances of CIM_ListenerDestination.

1010 **7.17.2.2.3 Query**

1011 The CIM_IndicationFilter.Query property may have the value "SELECT * FROM CIM_InstDeletion
1012 WHERE SourceInstance ISA CIM_ListenerDestination".

1013 **7.17.2.3 Indication Subscription Removal**

1014 There may be an indication filter as defined in this clause.

1015 Subscribers to this indication are going to be informed when a subscription is deleted. An indication is not
1016 going to be sent to the clients who have unsubscribed because the subscription is absent.

1017 **7.17.2.3.1 Indication Filter Name**

1018 The indication filter name shall be "DMTF:Indications:IndicationSubscriptionRemoval".

1019 7.17.2.3.2 Filtered Events

1020 The indication filter shall filter for notification of the deletion of instances of CIM_IndicationSubscription.

1021 7.17.2.3.3 Query

1022 The CIM_IndicationFilter.Query property may have the value "SELECT * FROM CIM_InstDeletion
1023 WHERE SourceInstance ISA CIM_IndicationSubscription".

1024 7.17.2.4 Filter Collection Subscription Removal

1025 There may be an indication filter as defined in this clause.

1026 Subscribers to this indication are going to be informed when a subscription to a filter collection is deleted.
1027 An indication is not going to be sent to the clients who have unsubscribed because the subscription is
1028 absent.

1029 7.17.2.4.1 Indication Filter Name

1030 The indication filter name shall be "DMTF:Indications:FilterCollectionSubscriptionRemoval".

1031 7.17.2.4.2 Filtered Events

1032 The indication filter shall filter for notification of the deletion of instances of
1033 CIM_FilterCollectionSubscription.

1034 7.17.2.4.3 Query

1035 The CIM_IndicationFilter.Query property may have the value "SELECT * FROM CIM_InstDeletion
1036 WHERE SourceInstance ISA CIM_FilterCollectionSubscription".

1037 8 Methods

1038 This section details the requirements for supporting intrinsic operations for the CIM elements defined by
1039 this profile. No extrinsic methods are defined by this profile.

1040 8.1 Profile Conventions for Operations

1041 Support for operations for each profile class (including associations) is specified in the following
1042 subclauses. Each subclause includes either the statement "All operations in the default list in 8.1 are
1043 supported as described by [DSP0200 version 1.2](#)" or a table listing all of the operations that are not
1044 supported by this profile or where the profile requires behavior other than that described by [DSP0200](#)
1045 [version 1.2](#). Operations that are not listed in the default list or that are not listed in a table in the
1046 subclauses are to be supported as described by [DSP0200 version 1.2](#).

1047 The default list of operations is as follows:

- 1048 • GetInstance
- 1049 • Associators
- 1050 • AssociatorNames
- 1051 • References
- 1052 • ReferenceNames
- 1053 • EnumerateInstances
- 1054 • EnumerateInstanceNames

1055 A compliant implementation shall support all of the operations in the default list for each class, unless the
 1056 “Requirement” column states something other than *Mandatory*.

1057 **8.2 CIM_HostedService**

1058 Table 2 lists operations that either have special requirements beyond those from [DSP0200 version 1.2](#) or
 1059 shall not be supported.

1060 **Table 2 – Operations: CIM_HostedService**

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

1061 **8.3 CIM_IndicationService**

1062 Table 3 lists operations that either have special requirements beyond those from [DSP0200 version 1.2](#) or
 1063 shall not be supported. All other operations may be supported as defined in DSP0200.

1064 **Table 3 – Operations: CIM_IndicationService**

Operation	Requirement	Messages
ModifyInstance	Conditional	See 8.3.1

1065 **8.3.1 CIM_IndicationService—ModifyInstance**

1066 This section details the requirements for the ModifyInstance operation applied to an instance of
 1067 CIM_IndicationService.

1068 **8.3.1.1 General**

1069 Support for the ModifyInstance operation is conditional. The ModifyInstance operation shall be supported
 1070 for an instance of CIM_IndicationService if an instance of CIM_IndicationServiceCapabilities is associated
 1071 with the CIM_IndicationService instance and at least one of the following properties of the
 1072 CIM_IndicationServiceCapabilities instance has a value of True:

- 1073 • FilterCreationEnabledIsSettable
- 1074 • DeliveryRetryAttemptsIsSettable
- 1075 • DeliveryRetryIntervalsSettable
- 1076 • SubscriptionRemovalActionIsSettable
- 1077 • SubscriptionRemovalTimeIntervalsSettable

1078 **8.3.1.2 CIM_IndicationService.FilterCreationEnabled**

1079 If an instance of CIM_IndicationServiceCapabilities is associated with the CIM_IndicationService instance
 1080 and the FilterCreationEnabledIsSettable property of the CIM_IndicationServiceCapabilities instance has a
 1081 value of True, the implementation shall allow the ModifyInstance operation to change the value of the
 1082 FilterCreationEnabled property of the CIM_IndicationService instance.

1083 If an instance of CIM_IndicationServiceCapabilities is associated with the CIM_IndicationService instance
1084 and the FilterCreationEnabledIsSettable property of the CIM_IndicationServiceCapabilities instance has a
1085 value of False, the implementation shall not allow the ModifyInstance operation to change the value of the
1086 FilterCreationEnabled property of the CIM_IndicationService instance.

1087 **8.3.1.3 CIM_IndicationService.DeliveryRetryAttempts**

1088 If an instance of CIM_IndicationServiceCapabilities is associated with the CIM_IndicationService instance
1089 and the DeliveryRetryAttemptsIsSettable property of the CIM_IndicationServiceCapabilities instance has
1090 a value of True, the implementation shall allow the ModifyInstance operation to change the value of the
1091 DeliveryRetryAttempts property of the CIM_IndicationService instance.

1092 If an instance of CIM_IndicationServiceCapabilities is associated with the CIM_IndicationService instance
1093 and the DeliveryRetryAttemptsIsSettable property of the CIM_IndicationServiceCapabilities instance has
1094 a value of False, the implementation shall not allow the ModifyInstance operation to change the value of
1095 the DeliveryRetryAttempts property of the CIM_IndicationService instance.

1096 **8.3.1.4 CIM_IndicationService.DeliveryRetryInterval**

1097 If an instance of CIM_IndicationServiceCapabilities is associated with the CIM_IndicationService instance
1098 and the DeliveryRetryIntervalsIsSettable property of the CIM_IndicationServiceCapabilities instance has a
1099 value of True, the implementation shall allow the ModifyInstance operation to change the value of the
1100 DeliveryRetryInterval property of the CIM_IndicationService instance.

1101 If an instance of CIM_IndicationServiceCapabilities is associated with the CIM_IndicationService instance
1102 and the DeliveryRetryIntervalsIsSettable property of the CIM_IndicationServiceCapabilities instance has a
1103 value of False, the implementation shall not allow the ModifyInstance operation to change the value of the
1104 DeliveryRetryInterval property of the CIM_IndicationService instance.

1105 **8.3.1.5 CIM_IndicationService.SubscriptionRemovalAction**

1106 If an instance of CIM_IndicationServiceCapabilities is associated with the CIM_IndicationService instance
1107 and the SubscriptionRemovalActionIsSettable property of the CIM_IndicationServiceCapabilities instance
1108 has a value of True, the implementation shall allow the ModifyInstance operation to change the value of
1109 the SubscriptionRemovalAction property of the CIM_IndicationService instance.

1110 If an instance of CIM_IndicationServiceCapabilities is associated with the CIM_IndicationService instance
1111 and the SubscriptionRemovalActionIsSettable property of the CIM_IndicationServiceCapabilities instance
1112 has a value of False, the implementation shall not allow the ModifyInstance operation to change the value
1113 of the SubscriptionRemovalAction property of the CIM_IndicationService instance.

1114 **8.3.1.6 CIM_IndicationService.SubscriptionRemovalTimeInterval**

1115 If an instance of CIM_IndicationServiceCapabilities is associated with the CIM_IndicationService instance
1116 and the SubscriptionRemovalTimeIntervalIsSettable property of the CIM_IndicationServiceCapabilities
1117 instance has a value of True, the implementation shall allow the ModifyInstance operation to change the
1118 value of the SubscriptionTimeInterval property of the CIM_IndicationService instance.

1119 If an instance of CIM_IndicationServiceCapabilities is associated with the CIM_IndicationService instance
1120 and the SubscriptionRemovalTimeIntervalIsSettable property of the CIM_IndicationServiceCapabilities
1121 instance has a value of False, the implementation shall not allow the ModifyInstance operation to change
1122 the value of the SubscriptionTimeInterval property of the CIM_IndicationService instance.

1123 **8.4 CIM_IndicationServiceCapabilities**

1124 All operations in the default list in clause 8.1 are supported as described by DSP0200 version 1.2.

1125

1126 **8.5 CIM_IndicationServiceSettingData**

1127 All operations in the default list in clause 8.1 are supported as described by DSP0200 version 1.2.
1128

1129 **8.6 CIM_IndicationFilter**

1130 Table 4 lists operations that either have special requirements beyond those from [DSP0200 version 1.2](#) or
1131 shall not be supported.

1132 **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

1133 **8.6.1 CIM_IndicationFilter—CreateInstance**

1134 This section details the requirements for the CreateInstance operation applied to an instance of
1135 CIM_IndicationFilter.

1136 **8.6.1.1 General Requirements**

1137 The WBEM Server shall return a status code of CIM_ERROR_NOT_SUPPORTED in response to the
1138 CreateInstance method invoked by the client if the indication service is unable to support the indication
1139 filter. If an error is returned, the subscription is not activated.

1140 If the CIM_IndicationFilter is valid and the indication service is able to support it, the server-side
1141 implementation shall create an instance CIM_ServiceAffectsElement that associates the
1142 CIM_IndicationFilter instance to the instance of CIM_IndicationService.

1143 If a client attempts to create an instance of CIM_IndicationFilter by using the CreateInstance operation
1144 and the implementation determines that the query is invalid or not supportable, the implementation shall
1145 reject the operation and return a status code of CIM_ERROR_INVALID_PARAMETER in a CIM_Error
1146 instance response.

1147 If a client attempts to create an instance of CIM_IndicationFilter by using the CreateInstance operation
1148 and dynamic filters are not supported by the WBEM Server in this case, the WBEM Server shall reject the
1149 operation and return a status code of CIM_ERROR_NOT_SUPPORTED in a CIM_Error instance
1150 response.

1151 If a client attempts to create an instance of CIM_IndicationFilter by using the CreateInstance operation
1152 and the implementation is able to determine that an identical instance of CIM_IndicationFilter exists, the
1153 implementation should reject the operation and return a status code of
1154 CIM_ERROR_ALREADY_EXISTS in a CIM_Error instance response. The existing CIM_IndicationFilter
1155 instance object path shall be specified in the returned CIM_Error.ErrorSource instance property.

1156 Clients should not populate the key properties of CIM_IndicationFilter when performing the
1157 CreateInstance operation. If the client populates the key properties of CIM_IndicationFilter, the
1158 implementation shall ignore these properties.

1159 **8.6.1.2 Conditional Requirement**

1160 The CreateInstance operation shall be supported for CIM_IndicationFilter if either of the following
1161 conditions is met:

- 1162 • The CIM_IndicationService.FilterCreationEnabled property has the value True.
- 1163 • An associated instance of CIM_IndicationServiceCapabilities exists, and the
- 1164 CIM_IndicationServiceCapabilities.FilterCreationEnabledIsSettable property has the value True.

1165 **8.6.2 CIM_IndicationFilter—DeleteInstance**

1166 This section details the requirements for the DeleteInstance operation applied to an instance of
1167 CIM_IndicationFilter.

1168 **8.6.2.1 General Requirements**

1169 If the instance of CIM_IndicationFilter is referenced by one or more instances of
1170 CIM_IndicationSubscription, the DeleteInstance operation shall not delete the CIM_IndicationFilter
1171 instance. If the CIM_IndicationFilter instance is not deleted, the operation shall return an error.

1172 If an instance of CIM_IndicationFilter is deleted, all instances of CIM_ServiceAffectsElement that
1173 reference the instance of CIM_IndicationFilter shall also be deleted by the server-side implementation.

1174 If a client attempts to delete a static instance of CIM_IndicationFilter by using the DeleteInstance
1175 operation, the WBEM Server shall reject the operation and return a status code of
1176 CIM_ERROR_NOT_SUPPORTED.

1177 **8.6.2.2 Conditional Requirement**

1178 The DeleteInstance operation shall be supported for CIM_IndicationFilter if either of the following
1179 conditions is met:

- 1180 • The CIM_IndicationService.FilterCreationEnabled property has the value True.
- 1181 • An associated instance of CIM_IndicationServiceCapabilities exists, and the
- 1182 CIM_IndicationServiceCapabilities.FilterCreationEnabledIsSettable property has the value True.

1183 **8.6.3 CIM_IndicationFilter—ModifyInstance**

1184 The ModifyInstance operation may be supported for an instance of CIM_IndicationFilter that represents a
1185 dynamic filter. The ModifyInstance operation may be supported for an instance of CIM_IndicationFilter
1186 that represents a static filter that is not defined by a profile. The ModifyInstance operation shall not be
1187 supported for an instance of CIM_IndicationFilter that represents a static filter defined by a profile.

1188 **8.7 CIM_FilterCollection**

1189 All operations in the default list in 8.1 are supported as described by [DSP0200 version 1.2](#).

1190 **8.8 CIM_ListenerDestination**

1191 Table 5 lists operations that either have special requirements beyond those from [DSP0200 version 1.2](#) or
 1192 shall not be supported.

1193 **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.

1194 **8.8.1 CIM_ListenerDestination—CreateInstance**

1195 This section details the requirements for the CreateInstance operation applied to an instance of
 1196 CIM_ListenerDestination.

1197 Upon successful creation of the instance of CIM_ListenerDestination, the server-side implementation
 1198 shall create an instance of CIM_ServiceAffectsElement in which the AffectedElement property value
 1199 references the instance of CIM_ListenerDestination created and the Service property references the
 1200 instance of the CIM_IndicationService that can manage the listener destination information.

1201 If as many instances of CIM_ListenerDestination exist as the value of the
 1202 CIM_IndicationServiceCapabilities.MaxListenerDestination property, the CreateInstance method shall fail.

1203 **8.8.2 CIM_ListenerDestination—DeleteInstance**

1204 This section details the requirements for the DeleteInstance operation applied to an instance of
 1205 CIM_ListenerDestination.

1206 If the instance of CIM_ListenerDestination is referenced by one or more instances of
 1207 CIM_IndicationSubscription or CIM_FilterCollectionSubscription, the DeleteInstance operation shall not
 1208 delete the CIM_ListenerDestination instance. Otherwise, if the CIM_ListenerDestination instance is not
 1209 deleted, the operation shall return an error.

1210 When an instance of CIM_ListenerDestination is deleted, all instances of CIM_ServiceAffectsElement in
 1211 which the AffectedElement property value references the instance of CIM_ListenerDestination to be
 1212 deleted shall also be deleted.

1213 **8.8.3 CIM_ListenerDestination—ModifyInstance**

1214 The ModifyInstance operation may be supported for an instance of CIM_ListenerDestination.

1215 **8.9 CIM_IndicationSubscription**

1216 Table 6 lists operations that either have special requirements beyond those from [DSP0200 version 1.2](#) or
 1217 shall not be supported.

1218

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

1219 8.9.1 CIM_IndicationSubscription—CreateInstance

1220 This section details the requirements for the CreateInstance operation applied to an instance of
 1221 CIM_IndicationSubscription.

1222 Support for the CreateInstance operation is conditional. The CreateInstance operation shall be supported
 1223 if at least one instance of CIM_IndicationFilter is associated with the CIM_IndicationService through an
 1224 instance of CIM_ServiceAffectsElement, where the CIM_IndicationFilter.IndividualSubscriptionSupported
 1225 property has the value True.

1226 The CreateInstance operation shall return a status code of CIM_ERROR_NOT_SUPPORTED if the
 1227 referenced instance of CIM_IndicationFilter is not valid. If an error is returned, the subscription is not
 1228 activated. Successful creation of an instance of CIM_IndicationSubscription activates the client
 1229 application’s subscription for delivery of the indications selected by the specified indication filter to the
 1230 specified destination.

1231 The CreateInstance operation shall return a status code of CIM_ERROR_NOT_SUPPORTED if the
 1232 value of the CIM_IndicationFilter.IndividualSubscriptionSupported property is False for the referenced
 1233 instance of CIM_IndicationFilter.

1234 8.9.2 CIM_IndicationSubscription—DeleteInstance

1235 This section details the requirements for the DeleteInstance operation applied to an instance of
 1236 CIM_IndicationSubscription.

1237 Support for the DeleteInstance operation is conditional. The DeleteInstance operation shall be supported
 1238 if at least one instance of CIM_IndicationFilter is associated with the CIM_IndicationService instance
 1239 through an instance of CIM_ServiceAffectsElement, where the
 1240 CIM_IndicationFilter.IndividualSubscriptionSupported property has the value True.

1241 Upon deletion of an instance of CIM_IndicationSubscription, the client application subscription is
 1242 deactivated and the destination is considered unsubscribed.

1243 8.9.3 CIM_IndicationSubscription—ModifyInstance

1244 The ModifyInstance operation may be supported for an instance of CIM_IndicationSubscription.

1245 **8.10 CIM_FilterCollectionSubscription**

1246 Table 7 lists operations that either have special requirements beyond those from [DSP0200 version 1.2](#) or
 1247 shall not be supported.

1248 **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

1249 **8.10.1 CIM_FilterCollectionSubscription—CreateInstance**

1250 This section details the requirements for the CreateInstance operation applied to an instance of
 1251 CIM_FilterCollectionSubscription.

1252 Successful creation of an instance of CIM_FilterCollectionSubscription activates the client application's
 1253 subscription for delivery of the indications selected by the indication filters that are members of the
 1254 collection subscribed to. Subscriptions are also recursively activated to collections that are members of
 1255 the collection subscribed to.

1256 **8.10.2 CIM_FilterCollectionSubscription—DeleteInstance**

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

1259 When an instance of CIM_FilterCollectionSubscription is deleted, the client application subscription is
 1260 deactivated and the client is considered unsubscribed.

1261 **8.10.3 CIM_FilterCollectionSubscription—ModifyInstance**

1262 The ModifyInstance operation may be supported for an instance of CIM_FilterCollectionSubscription.

1263 **8.11 CIM_ServiceAffectsElement**

1264 Table 8 lists operations that either have special requirements beyond those from [DSP0200 version 1.2](#) or
 1265 shall not be supported.

1266 **Table 8 – Operations: CIM_ServiceAffectsElement**

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

1267 **8.12 CIM_MemberOfCollection**

1268 Table 9 lists operations that either have special requirements beyond those from [DSP0200 version 1.2](#) or
 1269 shall not be supported.

1270 **Table 9 – Operations: CIM_MemberOfCollection**

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

1271 **8.13 CIM_ElementSettingData**

1272 Table 10 lists operations that either have special requirements beyond those from [DSP0200 version 1.2](#)
 1273 or shall not be supported.

1274 **Table 10 – Operations: CIM_ElementSettingData**

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

1275 **8.14 CIM_OwningCollectionElement**

1276 Table 11 lists operations that either have special requirements beyond those from [DSP0200 version 1.2](#)
 1277 or shall not be supported.

1278 **Table 11 – Operations: CIM_OwningCollectionElement**

Operation	Requirement	Messages
Associators	Unspecified	None
AssociatorNames	Unspecified	None

References	Unspecified	None
ReferenceNames	Unspecified	None

1279 **8.15 CIM_ConcreteDependency**

1280 Table 12 lists operations that either have special requirements beyond those from [DSP0200 version 1.2](#)
 1281 or shall not be supported.

1282 **Table 12 – Operations: CIM_ConcreteDependency**

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

1283 **8.16 CIM_HostedService**

1284 Table 13 lists operations that either have special requirements beyond those from [DSP0200 version 1.2](#)
 1285 or shall not be supported.

1286 **Table 13 – Operations: CIM_HostedService**

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

1287 **9 Use Cases**

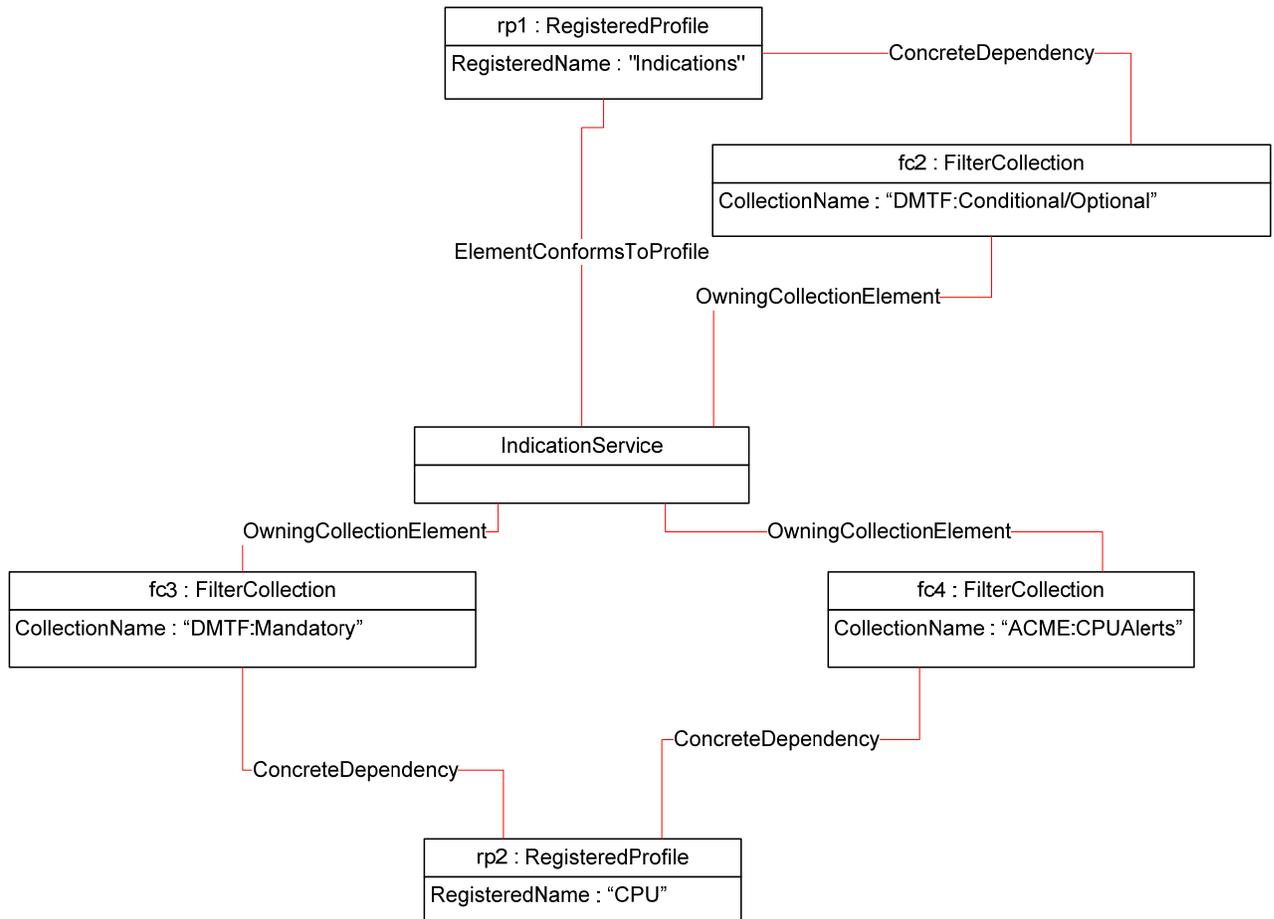
1288 This clause provides informative use cases and object diagrams.

1289 **9.1 Object Diagrams**

1290 For simplicity, the prefix *CIM_* has been removed from the names of the classes.

1291 Figure 3 is an object diagram showing a possible implementation of the profile. In this diagram, the
 1292 optional indications defined are supported. This support is indicated by the existence of fc2 associated
 1293 through the CIM_ConcreteDependency instance with rp1. Mandatory indication filters and an optional
 1294 vendor-defined collection of filters are defined for the *CPU Profile* as well. This is indicated by the
 1295 existence of fc3 and fc4 associated with rp2 through the CIM_ConcreteDependency instance.

1296

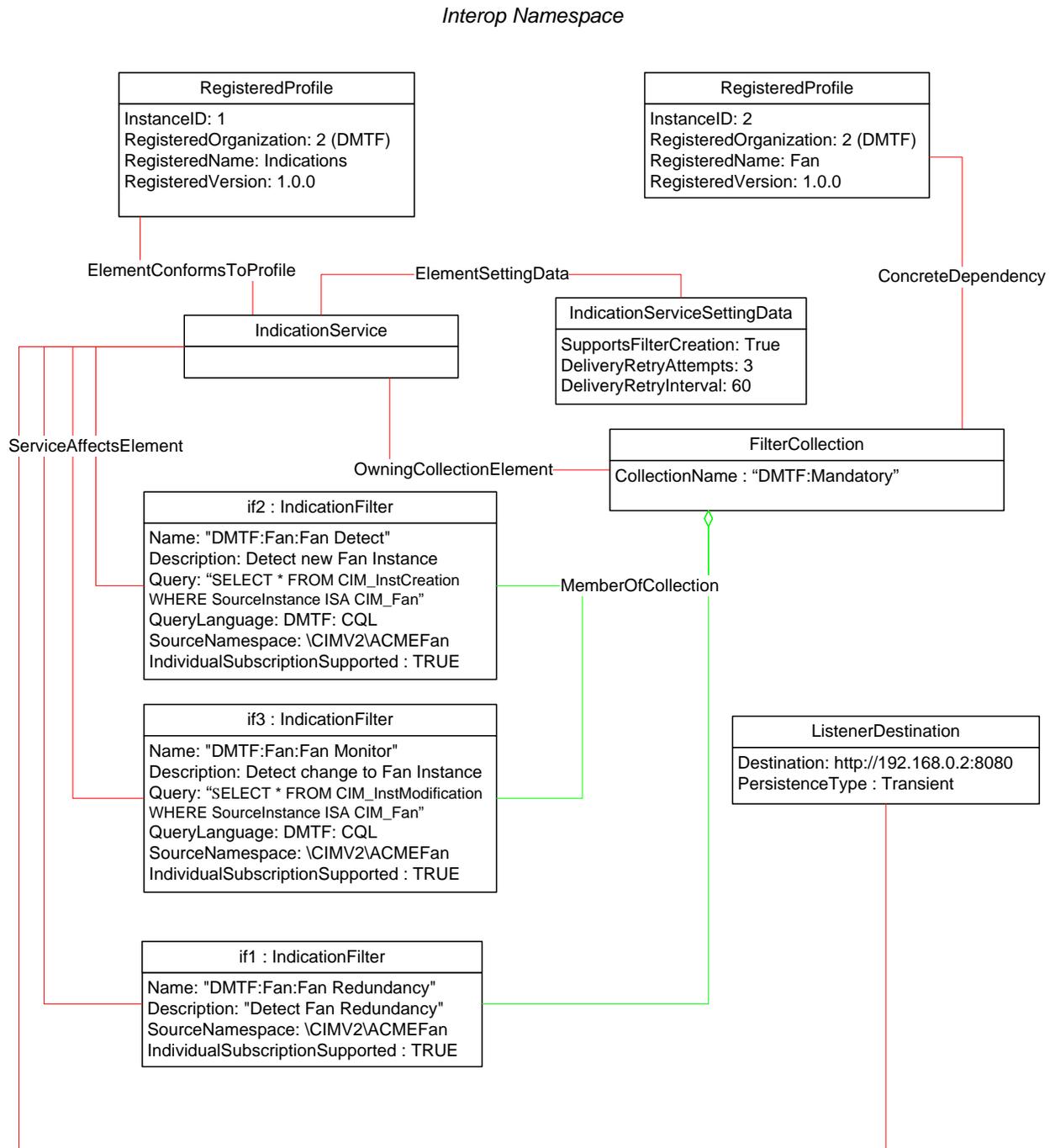


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Figure 3 – Filter Collections Instance Diagram

1300 Figure 4 is an object diagram showing an implementation that supports mandatory indications defined in
 1301 the *Fan Profile*. The implementation has explicitly instantiated instances of CIM_IndicationFilter to
 1302 represent three of the mandatory indication filters. if2 and if3 are filters for lifecycle indications. if1 is a
 1303 filter for alert indications related to changes in the status of fan redundancy.

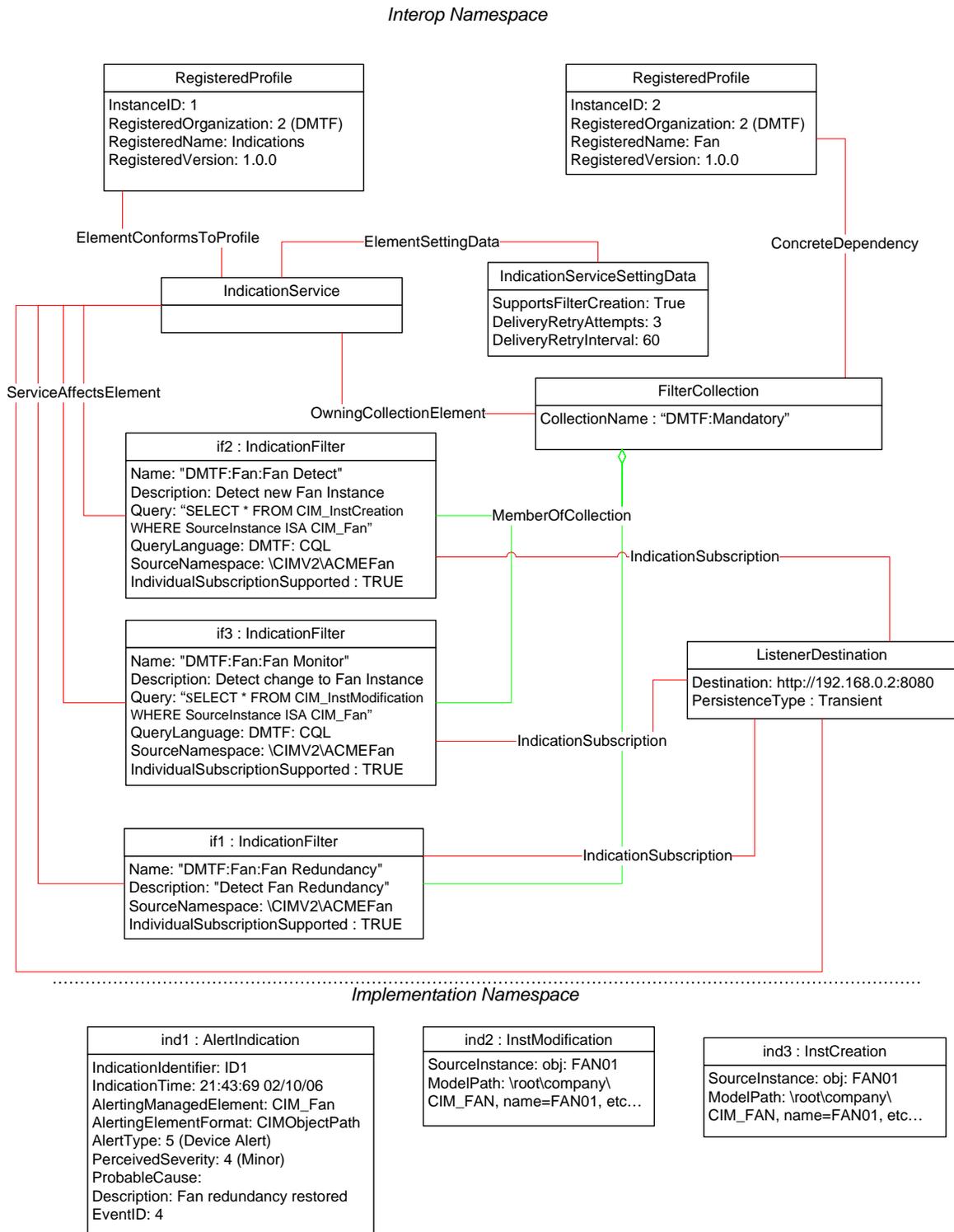


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Figure 4 – Indications Profile Instance Diagram

1306 Figure 5 shows the same implementation as Figure 4 with the addition of individual subscriptions for each
 1307 of the individually modeled indication filters. The three individual indication instances, ind1, ind2, and
 1308 ind3, match these indication filters.

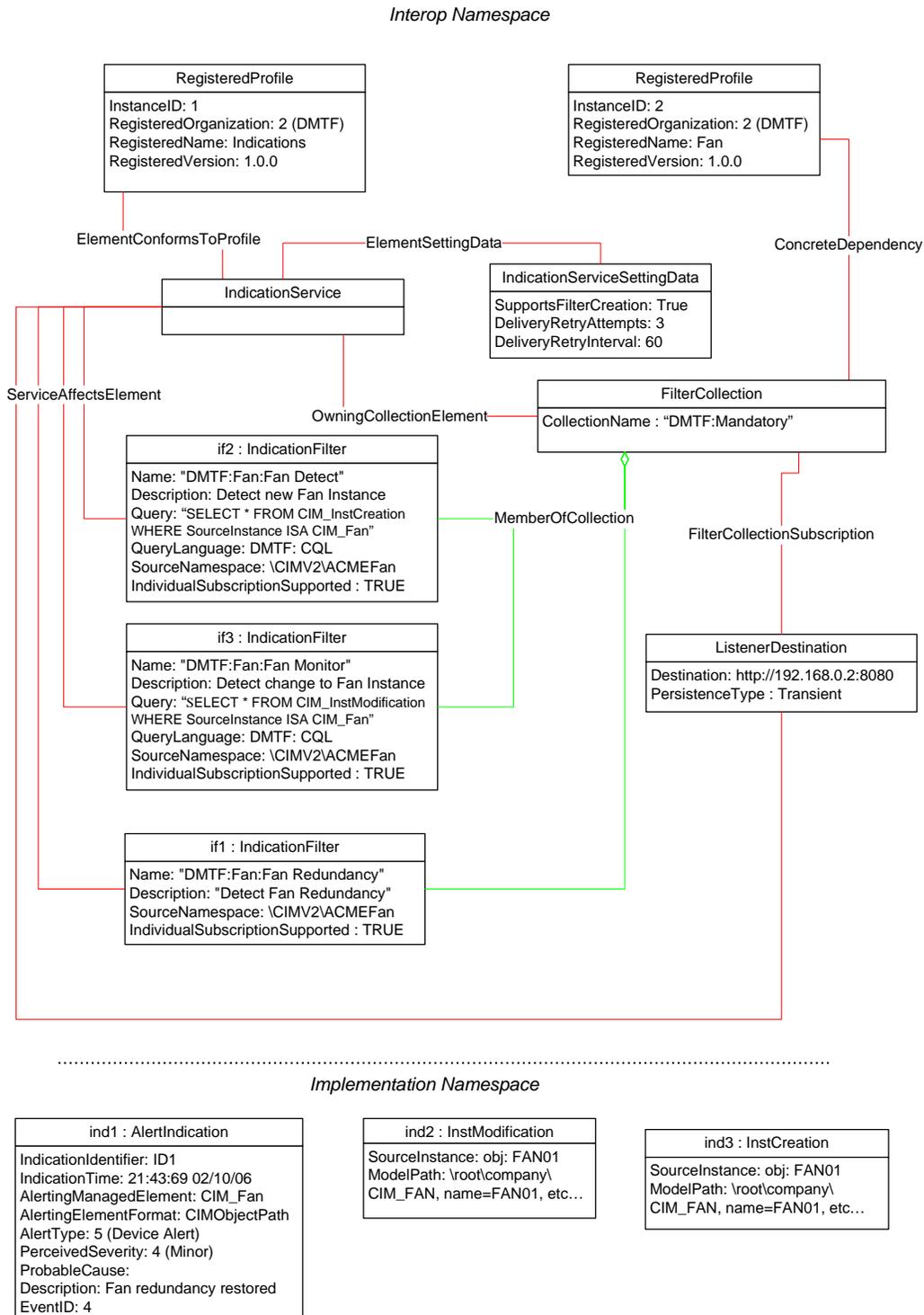


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Figure 5 – Individual Subscriptions

1311 Figure 6 is an object diagram for the same implementation as Figure 4 with the addition of a collection
 1312 subscription. The three individual indication instances, ind1, ind2, and ind3, match the indication filters
 1313 contained in the CIM_FilterCollection instance.

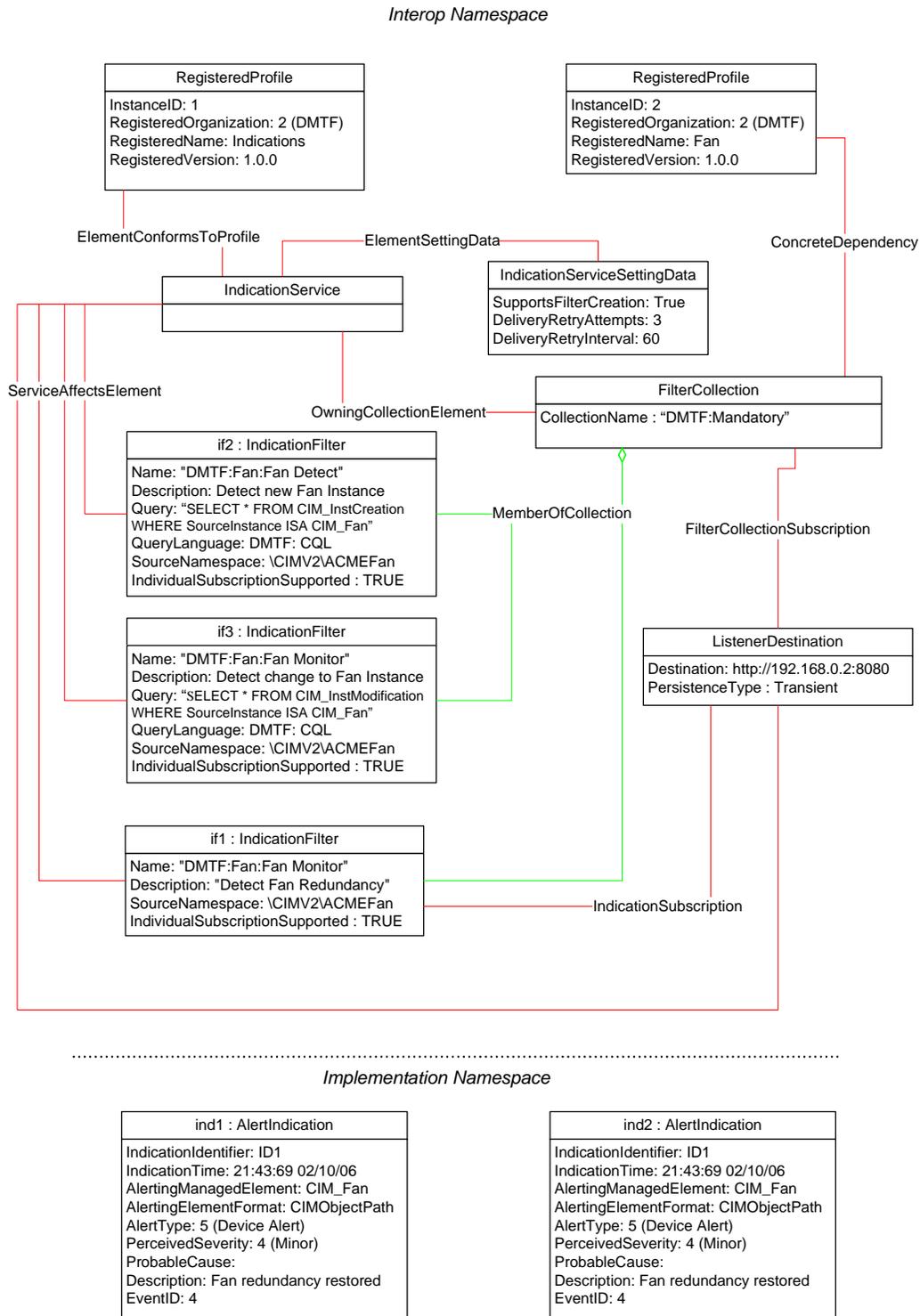


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Figure 6 – Collection Subscription

1316 Figure 7 is an object diagram for the same implementation shown in Figure 4. A subscription has been
 1317 created for the filter collection as well as an individual subscription to if1. This results in the duplicate
 1318 notification ind1 and ind2.

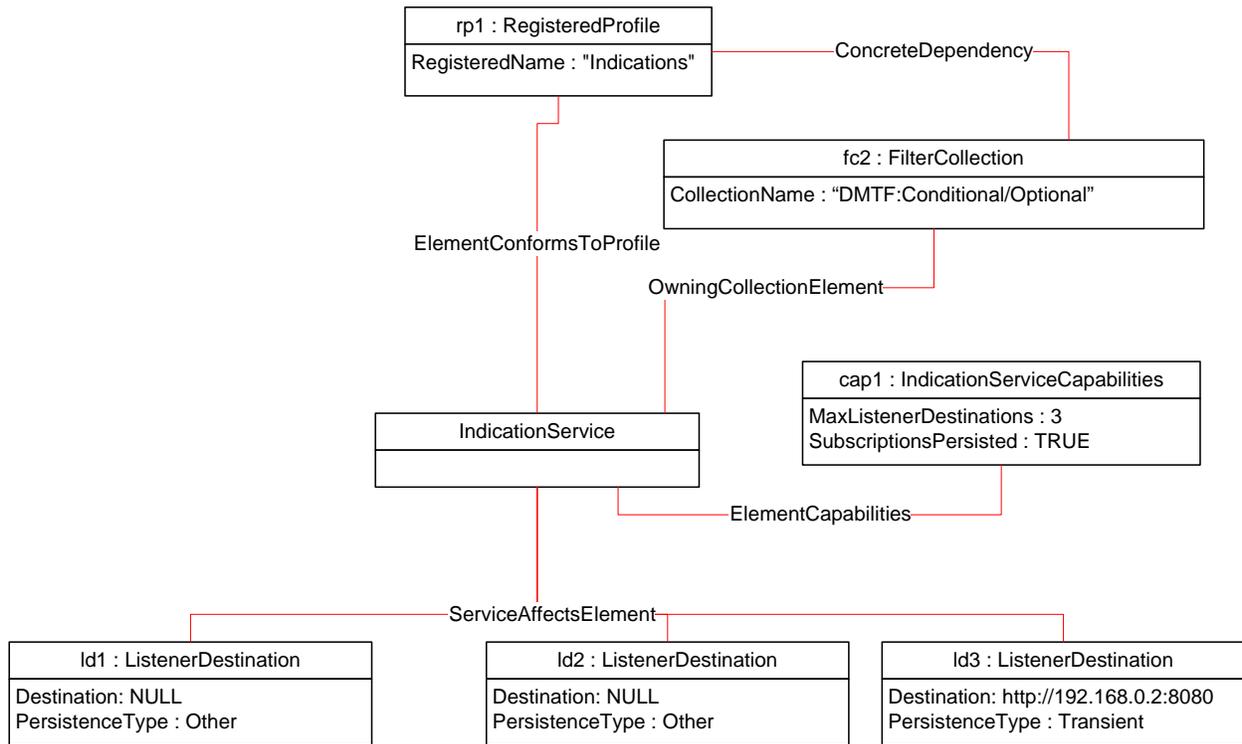


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1320

Figure 7 – Duplicate Subscriptions

1321 Figure 8 is an object diagram for an implementation that supports a fixed number of listener destinations.
 1322 A management client selects one of the existing instances of CIM_ListenerDestination and modifies it
 1323 appropriately to specify a desired destination for indication delivery. The implementation supports three
 1324 listener destinations, which is indicated by the
 1325 CIM_IndicationServiceCapabilities.MaxListenerDestinations property. The implementation statically
 1326 creates instances of CIM_ListenerDestination. Id3 is currently configured to represent a transient listener
 1327 destination. Id1 and Id2 are not configured and could be used by a client to identify desired destinations.



1328

1329

Figure 8 – Statically Provided Listener Destinations

1330 **9.2 Determine Whether Dynamic Filters Are Supported**

1331 Given an instance of CIM_IndicationService, a client can determine if dynamic filters are supported as
 1332 follows:

- 1333 1) Query the CIM_IndicationService.FilterCreationEnabled property. If the property has the value
 1334 True, dynamic filters are supported.
- 1335 2) If the property is False, find the associated instance of CIM_IndicationServiceCapabilities.
- 1336 3) If an instance is found, query the value of the FilterCreationEnabledIsSettable property.
- 1337 4) If FilterCreationEnabledIsSettable is True, modify the CIM_IndicationService, setting the
 1338 FilterCreateEnabled property to True.
- 1339 5) If the modification is successful, creating dynamic filters is supported. If the modification is
 1340 unsuccessful, creating dynamic filters is not supported.

1341 9.3 Create a Dynamic Filter for Alert Indications

1342 Given the Owning Entity and Message Identifier for a standard message, a client can create a dynamic
1343 filter for an alert indication as follows:

- 1344 1) Determine if dynamic filter creation is supported using the steps in 9.2.
- 1345 2) If dynamic filter creation is supported, determine the query languages supported for indication
1346 filters using the steps in 9.17.
- 1347 3) Using one of the supported query languages, create an instance of CIM_IndicationFilter in
1348 which the QueryLanguage property identifies one of the supported query languages and the
1349 Query property constrains the CIM_AlertIndication.OwningEntity and
1350 CIM_AlertIndication.MessageId properties to be the desired values.

1351 9.4 Select a Listener Destination for Delivery of Indications

1352 Given a destination to which the client wants to have indications delivered, a client can ensure that an
1353 appropriate CIM_ListenerDestination exists, as follows:

- 1354 1) Find all instances of CIM_ListenerDestination that are associated with the
1355 CIM_IndicationService through an instance of CIM_ServiceAffectsElement.
- 1356 2) For each instance of CIM_ListenerDestination, query the Destination property to determine if it
1357 represents the desired destination for indication delivery.

1358 If an instance of CIM_ListenerDestination is not found, the client can use CreateInstance (or an
1359 equivalent operation) to create a new instance of CIM_ListenerDestination for indication delivery by
1360 specifying an appropriate instance of CIM_ListenerDestination as input to the operation.

1361 9.5 Create a Subscription for a Single Filter

1362 Given a desired destination for indication delivery and a desired filter, a client can create a subscription
1363 for an indication filter as follows:

- 1364 1) Find all instances of CIM_IndicationFilter that are associated with the CIM_IndicationService
1365 instance through an instance of CIM_ServiceAffectsElement.
- 1366 2) For each instance of CIM_IndicationFilter, evaluate the QueryLanguage and Query properties to
1367 determine if the CIM_IndicationFilter represents the desired indication filter.
- 1368 3) If an instance of CIM_IndicationFilter is found, query the IndividualSubscriptionSupported
1369 property to determine if the server-side implementation supports subscribing to this filter
1370 individually. If the property is True, individual subscription to this filter is supported. If the
1371 property is False, subscription to the individual filter is not supported and a dynamic filter needs
1372 to be created using the steps in 9.3.
- 1373 4) Using the steps in 9.4, select an instance of CIM_ListenerDestination that represents the
1374 desired destination.
- 1375 5) Use CreateInstance (or an equivalent) operation to create an instance of
1376 CIM_IndicationSubscription that references the CIM_IndicationFilter from step 1) and the
1377 CIM_ListenerDestination from step 4).

1378 9.6 Subscribe for All Mandatory Indications for a Profile

1379 A client can subscribe for all of the mandatory indications defined for a profile as follows:

- 1380 1) Determine if mandatory indications are supported for the profile.

- 1381 2) If mandatory indications are supported for the profile, use the steps in 9.18 to subscribe to the
1382 CIM_FilterCollection instance that represents the mandatory filters.

1383 9.7 Determine Whether a Subscription Exists for a Given Filter and Destination

1384 A client can determine whether a subscription exists for a particular destination and filter as follows:

- 1385 1) Find all instances of CIM_ListenerDestination that are associated with the
1386 CIM_IndicationService instance through an instance of CIM_ServiceAffectsElement.
- 1387 2) For each instance of CIM_ListenerDestination, if the Destination property identifies the
1388 destination of interest, perform the following steps:
- 1389 a) Find all instances of CIM_IndicationFilter that are associated with the
1390 CIM_ListenerDestination instance through an instance of CIM_IndicationSubscription.
- 1391 b) For each instance of CIM_IndicationFilter, if the QueryLanguage and Query properties
1392 match the filter of interest, a subscription exists for the given filter and destination.
- 1393 c) Find all instances of CIM_FilterCollection that are associated with the
1394 CIM_ListenerDestination instance through an instance of CIM_IndicationFilterSubscription.
- 1395 d) For each instance of CIM_FilterCollection, evaluate the
1396 CIM_FilterCollection.CollectionName property to determine if the client has knowledge of
1397 filters contained in the collection.
- 1398 3) If the client has knowledge, determine whether the CIM_FilterCollection instance contains the
1399 filter of interest. If it does, a subscription exists for the given filter and destination.
- 1400 4) If the client does not have knowledge, find all instances of CIM_IndicationFilter that are
1401 associated with the CIM_FilterCollection instance through an instance of
1402 CIM_MemberOfCollection. For each instance of CIM_IndicationFilter, if the Query property
1403 matches the filter of interest, a subscription exists for the given filter and destination.

1404 9.8 Determine the Components for Which Lifecycle Indications Are Available

1405 Given an instance of CIM_IndicationFilter that filters for lifecycle indications, a client can determine the
1406 components for which the specified lifecycle indications can be provided, as follows:

- 1407 1) Find the instances of CIM_FilterCollection with which the CIM_IndicationFilter instance is
1408 associated through an instance of CIM_MemberOfCollection.
- 1409 a) For each instance of CIM_FilterCollection, find the associated instances of
1410 CIM_RegisteredProfile.
- 1411 b) For each instance of CIM_RegisteredProfile, find the instances of CIM_ManagedElement
1412 that are in the scope of the profile.
- 1413 c) For each instance of CIM_ManagedElement, determine if it is implemented in a
1414 namespace identified by one of the values of the CIM_IndicationFilter.SourceNamespaces
1415 property, or if it is in the same namespace as the instance of CIM_IndicationFilter.
- 1416 d) For each instance of CIM_ManagedElement, determine if it matches the query specified by
1417 the QueryLanguage and Query properties of the CIM_IndicationFilter.
- 1418 If it matches the query, lifecycle indications filtered by the CIM_IndicationFilter are
1419 available for the CIM_ManagedElement instance.
- 1420 2) If the instance of CIM_IndicationFilter is not associated with any instances of
1421 CIM_FilterCollection, determine the namespaces to which the filter applies by querying the
1422 value of the SourceNamespaces property.

1423 If the SourceNamespaces property is empty, the CIM_IndicationFilter applies to the namespace
1424 in which it is instantiated.

1425 If the SourceNamespaces property is not empty, the CIM_IndicationFilter applies to each
1426 identified namespace.

1427 3) For each instance of CIM_ManagedElement, determine if it matches the query specified by the
1428 Query property of the CIM_IndicationFilter. If it matches the query, lifecycle indications filtered by
1429 the CIM_IndicationFilter are available for the CIM_ManagedElement instance.

1430 **9.9 Subscribe for Indications of a Particular Severity**

1431 A client can subscribe for all indications of a particular severity as follows:

1432 Construct a query to select all instances of CIM_AlertIndication in which the PerceivedSeverity property
1433 has the desired value. Use this query as the input in the steps in 9.5.

1434 **9.10 Find the Scoping System for Which an Alert Indication Originated**

1435 Given an instance of CIM_AlertIndication, a client can determine the scoping system for which an
1436 indication originated, as follows:

- 1437 1) Starting with the value of the CIM_AlertIndication.AlertingManagedElement property, retrieve
1438 the CIM element identified.
- 1439 2) Using knowledge of profile definitions that contain the element, determine the profile with which
1440 the CIM element is conformant.
- 1441 3) Use the algorithm defined for the profile to find the Scoping Instance.

1442 **9.11 Remove a Subscription**

1443 Given an instance of CIM_IndicationSubscription that represents an indication subscription, a client can
1444 remove the subscription as follows:

- 1445 1) Invoke the DeleteInstance operation on the instance of CIM_IndicationSubscription.
- 1446 2) If the previously referenced instance of CIM_IndicationFilter was a dynamic filter created by the
1447 client, no other instances of CIM_IndicationSubscription reference it, and the client does not
1448 plan to create a new subscription for this filter, the client can delete the CIM_IndicationFilter.
- 1449 3) If the previously referenced instance of CIM_ListenerDestination was created by the client, no
1450 other instances of CIM_IndicationSubscription or CIM_FilterCollectionSubscription reference it,
1451 and the client does not plan to create a new subscription for this destination, the client can
1452 delete the CIM_ListenerDestination.

1453 **9.12 Remove a Listener Destination**

1454 A client can remove a listener destination as follows:

- 1455 1) Remove each indication subscription configured for the destination by using the steps in 9.11.
- 1456 2) Remove the listener destination by invoking the DeleteInstance operation on the instance of
1457 CIM_ListenerDestination.

1458 **9.13 Determine the Query That Triggered an Alert Indication**

1459 Given an instance of CIM_AlertIndication, a client can determine the indication filter that triggered an
1460 indication to be delivered, as follows:

- 1461 1) Query the value of the CIM_AlertIndication.IndicationFilterName.

1462 If the value of the property identifies an indication filter of which the client has knowledge, the
1463 client knows the filter that caused the indication to be triggered.

1464 If the value of the property does not identify an indication filter of which the client has knowledge, the
1465 client can find the indication filter as follows:

- 1466 a) Use the value of the CIM_AlertIndication.AlertingManagedElement property to find the
1467 WBEM Server from which the indication originated.
- 1468 b) Find the instance of CIM_IndicationService in the Interop Namespace of the WBEM
1469 Server.
- 1470 c) Find all instances of CIM_IndicationFilter that are associated with the
1471 CIM_IndicationService instance through an instance of CIM_ServiceAffectsElement.
- 1472 d) For each instance of CIM_IndicationFilter, determine if the value of the name property
1473 matches the value of the CIM_AlertIndication.IndicationFilterName property.
 - 1474 a) If it matches, the instance of CIM_IndicationFilter triggered the indication.
 - 1475 b) If a matching instance of CIM_IndicationFilter is not found, it is not possible for a client
1476 to determine the query.
- 1477 e) Query the value of the CIM_IndicationFilter.Query and
1478 CIM_IndicationFilter.QueryLanguage properties to determine the query that resulted in the
1479 indication.

1480 **9.14 Configure the Number of Retries for Indication Delivery**

1481 A client can configure the number of retries attempted by an indication service as follows:

- 1482 1) Find the instance of CIM_IndicationServiceCapabilities that is associated with the
1483 CIM_IndicationService instance through an instance of CIM_ElementCapabilities.
- 1484 2) Query the value of the CIM_IndicationServiceCapabilities.DeliveryRetryAttemptsIsSettable
1485 property.
 - 1486 1) If the value is True, use ModifyInstance to change the value of the
1487 CIM_IndicationService.DeliveryRetryAttempts to the desired value.
 - 1488 2) If the value is False, the number of retries attempted by the CIM_IndicationService cannot
1489 be changed.

1490 **9.15 Modify a Dynamic Filter**

1491 A client can modify a dynamic filter as follows:

- 1492 1) If the client maintained the object path of the instance of CIM_IndicationFilter that represents
1493 the dynamic filter, the client can invoke the DeleteInstance operation to remove the dynamic
1494 filter.
- 1495 2) If the client has not maintained the object path, the client can find the dynamic filter to replace
1496 as follows:
 - 1497 a) Find all instances of CIM_IndicationFilter that are associated with the
1498 CIM_IndicationService instance through an instance of CIM_ServiceAffectsElement.
 - 1499 b) For each instance of CIM_IndicationFilter, determine if it matches the dynamic filter
1500 previously created.
 - 1501 c) If it matches, attempt to modify the dynamic filter by using the ModifyInstance operation.
 - 1502 d) If the ModifyInstance operation is not supported, invoke the DeleteInstance operation to
1503 remove it.

- 1504 e) Use the CreateInstance operation, specifying the desired attribute values, to create a new
1505 instance of CIM_IndicationFilter.
- 1506 f) Replicate any CIM_IndicationSubscription instances that referenced the deleted instance
1507 of CIM_IndicationFilter, referencing the newly created CIM_IndicationFilter instance.

1508 **9.16 Filter for Indications from a Specific Namespace**

1509 A client can create a dynamic filter to receive indications from a specific namespace by using the steps in
1510 9.3 with the additional constraint of specifying a value for the CIM_IndicationFilter.SourceNamespaces
1511 property.

1512 **9.17 Determine the Query Language Supported for Filtering Indications**

1513 A client can determine the query languages supported for filtering indications as follows:

- 1514 1) Start with an empty set of supported query languages.
- 1515 2) Find all instances of CIM_IndicationFilter that are associated with the CIM_IndicationService
1516 instance through an instance of CIM_ServiceAffectsElement.
- 1517 3) For each instance of CIM_IndicationFilter, if the value of the
1518 CIM_IndicationFilter.QueryLanguage property is not included in the set from step 1), add it.

1519 NOTE: The supported query languages can alternately be determined through knowledge of the implementation or
1520 through a combination of CIM elements and operations that are outside the scope of this profile.

1521 **9.18 Subscribe to All Events in a Collection**

1522 Given an instance of CIM_FilterCollection that represents a collection of indication filters and a desired
1523 destination for delivery of all indications in the collection, a client can create a subscription to all events in
1524 the collection as follows:

- 1525 1) Select an instance of CIM_ListenerDestination that represents the desired destination by using
1526 the steps in 9.4.
- 1527 2) Given the instance of CIM_ListenerDestination, create a subscription by creating an instance of
1528 CIM_FilterCollectionSubscription by using the CreateInstance operation (or equivalent),
1529 specifying the desired configuration of the subscription and references to the
1530 CIM_ListenerDestination instance and the CIM_FilterCollection instance.

1531 **9.19 Subscribe for All of the Indications Defined in a Profile**

1532 Given an instance of CIM_ListenerDestination that represents a desired destination for indication delivery,
1533 a client can subscribe for all of the indications defined for implementations of a profile, as follows:

- 1534 1) Enumerate instances of CIM_RegisteredProfile in the Interop namespace.
- 1535 2) For each instance of CIM_RegisteredProfile, query the values of the RegisteredName,
1536 RegisteredVersion, and RegisteredOrganization properties to determine if the instance identifies
1537 the profile of interest.
- 1538 3) If the instance of CIM_RegisteredProfile identifies the profile of interest:
 - 1539 a) Find all instances of CIM_FilterCollection that are associated with the
1540 CIM_RegisteredProfile instance through an instance of CIM_ConcreteDependency.
 - 1541 If no instances of CIM_FilterCollection are found, indications are not supported for the
1542 profile.
 - 1543 b) For each instance of CIM_FilterCollection found, determine if it is referenced by an
1544 instance of CIM_MemberOfCollection, where it is the value of the Member reference.

- 1545 1) If the CIM_FilterCollection instance is the value of the Member reference, find the
 1546 CIM_FilterCollection instance that is the value of the Collection reference.
- 1547 • If the CIM_FilterCollection instance that is the value of the Collection reference is
 1548 not associated with the CIM_RegisteredProfile instance from step 2), create an
 1549 instance of CIM_FilterCollectionSubscription that references the
 1550 CIM_FilterCollection instance that is the Member reference and the
 1551 CIM_ListenerDestination instance that identifies the desired destination.
 - 1552 • If the CIM_FilterCollection that is the value of the Collection reference is
 1553 associated with the CIM_RegisteredProfile instance, skip it.
- 1554 2) If the CIM_FilterCollection is not the value of the Member reference, create an
 1555 instance of CIM_FilterCollectionSubscription that references the CIM_FilterCollection
 1556 instance and the CIM_ListenerDestination instance that identifies the desired
 1557 destination.

1558 **9.20 Determine the Maximum Number of Listener Destinations**

1559 Given an instance of CIM_IndicationService, a client can determine the maximum number of supported
 1560 listener destinations as follows:

- 1561 1) Find the associated instance of CIM_IndicationServiceCapabilities.
 1562 2) If an instance is found, query the value of the MaxListenerDestinations property.
 1563 If an instance is not found, the maximum number of listener destinations is unknown.

1564 **10 CIM Elements**

1565 Table 14 shows the instances of CIM Elements for this profile. Instances of the CIM Elements shall be
 1566 implemented as described in Table 14. Clauses 7 (“Implementation”) and 8 (“Methods”) may impose
 1567 additional requirements on these elements.

1568 **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.

Element Name	Requirement	Description
CIM_InstModification	Optional	See 10.15.
CIM_ListenerDestination	Mandatory	See 10.16.
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.

1569 **10.1 CIM_AlertIndication**

1570 CIM_AlertIndication is a specialized type of CIM_Indication that contains information about the severity,
 1571 cause, recommended actions, and other data of a real world event. Profiles that define support for
 1572 asynchronous notification of events can constrain this class and may require it. Table 15 contains the
 1573 requirements for elements of this class.

1574 **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

Elements	Requirement	Notes
CorrelatedIndications	Optional	IndicationIdentifiers whose notifications are correlated with this one
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.

1575 **10.2 CIM_ConcreteDependency**

1576 CIM_ConcreteDependency is used to associate instances of CIM_FilterCollection to instances of
 1577 CIM_RegisteredProfile. This association identifies the profile that provides context and scope to a
 1578 collection of indication filters. The existence of instances of CIM_ConcreteDependency is conditional on
 1579 the existence of instances of CIM_FilterCollection. Table 16 contains the requirements for elements of
 1580 this class.

1581 **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 *

1582 **10.3 CIM_ElementCapabilities**

1583 CIM_ElementCapabilities is used to associate an instance of CIM_IndicationServiceCapabilities with an
 1584 instance of CIM_IndicationService. An instance of CIM_ElementCapabilities is conditional on the
 1585 existence of an instance of CIM_IndicationServiceCapabilities. Table 17 contains the requirements for
 1586 elements of this class.

1587 **Table 17 – Class: CIM_ElementCapabilities**

Elements	Requirement	Notes
ManagedElement	Mandatory	Key: Shall reference the Central Instance Cardinality 1

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

1588 **10.4 CIM_ElementSettingData**

1589 CIM_ElementSettingData is used to associate an instance of CIM_IndicationServiceSettingData with an
 1590 instance of CIM_IndicationService. An instance of CIM_ElementSettingData is conditional on the
 1591 existence of an instance of CIM_IndicationServiceSettingData. Table 18 contains the requirements for
 1592 elements of this class.

1593 **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)

1594 **10.5 CIM_FilterCollection**

1595 CIM_FilterCollection represents collections of indication filters. Table 19 contains the requirements for
 1596 elements of this class.

1597 **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.

1598 **10.6 CIM_FilterCollectionSubscription**

1599 CIM_FilterCollectionSubscription is used to associate an instance of CIM_FilterCollection with an instance
 1600 of CIM_ListenerDestination. The existence of an instance of this class reflects the subscription to a
 1601 collection of instances of CIM_IndicationFilter. The association shall imply a subscription to all the
 1602 instances of CIM_IndicationFilter that are members of the collection. Support for this class is conditional
 1603 on support for CIM_FilterCollection. Table 20 contains the requirements for elements of this class.

1604

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 *
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)

1605 **10.7 CIM_HostedService**

1606 CIM_HostedService is used to relate the CIM_IndicationService instance to its scoping CIM_System
1607 instance. Table 21 contains the requirements for elements of this class.

1608

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..*

1609 **10.8 CIM_IndicationFilter**

1610 CIM_IndicationFilter represents static and dynamic indication filters. CIM_IndicationFilter is optional. It is
1611 expected that referencing profiles define mandatory instances of CIM_IndicationFilter such that the class

1612 is further constrained to be mandatory in the referencing profile. Table 22 contains the requirements for
 1613 elements of this class.

1614 **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

1615 **10.9 CIM_IndicationService**

1616 CIM_IndicationService is a component of the WBEM Server Service that represents support for indication
 1617 subscription. This class is the Central Class of the profile. Table 23 contains the requirements for
 1618 elements of this class.

1619 **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.

Elements	Requirement	Notes
SubscriptionRemovalTimeInterval	Mandatory	See 7.1.

1620 **10.10 CIM_IndicationServiceCapabilities**

1621 CIM_IndicationServiceCapabilities is an optional element that represents the capabilities of the
 1622 CIM_IndicationService instance. Table 24 contains the requirements for elements of this class.

1623 **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
DeliveryRetryIntervallsSettable	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
SubscriptionRemovalTimeIntervallsSettable	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

1624 **10.11 CIM_IndicationServiceSettingData**

1625 CIM_IndicationServiceSettingData is used to represent the initial configuration of the
 1626 CIM_IndicationService instance. Table 25 contains the requirements for elements of this class.

1627 **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.

1628 **10.12 CIM_IndicationSubscription**

1629 CIM_IndicationSubscription is used to associate an instance of CIM_IndicationFilter with an instance of
 1630 CIM_ListenerDestination. The existence of an instance of this class reflects the subscription to a single
 1631 CIM_IndicationFilter instance. CIM_IndicationSubscription is conditional. Instances of
 1632 CIM_IndicationSubscription may exist if at least one instance of CIM_IndicationFilter is associated with
 1633 the Central Instance through an instance of CIM_ServiceAffectsElement. Table 26 contains the
 1634 requirements for elements of this class.

1635 **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)

1636 **10.13 CIM_InstCreation**

1637 CIM_InstCreation notifies a handler when a new instance of a class is created. Referencing profiles that
 1638 require asynchronous notification of instance creation use this class. Table 27 contains the requirements
 1639 for elements of this class.

1640

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

1641 **10.14 CIM_InstDeletion**

1642 CIM_InstDeletion notifies a handler when an instance of a class is deleted. Referencing profiles that
 1643 require asynchronous notification of instance deletion use this class. Table 28 contains the requirements
 1644 for elements of this class.

1645

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

1646 **10.15 CIM_InstModification**

1647 CIM_InstModification notifies a handler when an instance (of a class defined in the Filter QueryString) is
 1648 modified or changed. Referencing profiles that require asynchronous notification of instance modification
 1649 use this class. Table 29 contains the requirements for elements of this class.

1650 **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.

1651 **10.16 CIM_ListenerDestination**

1652 CIM_ListenerDestination represents a destination for the delivery of indications. Table 30 contains the
 1653 requirements for elements of this class.

1654 **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 0.

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

1655 **10.17 CIM_MemberOfCollection**

1656 CIM_MemberOfCollection is used to aggregate instances of CIM_IndicationFilter or instances of
 1657 CIM_FilterCollection to an instance of CIM_FilterCollection. This class identifies an indication or collection
 1658 of indications as being part of a specific collection of indications. Table 31 contains the requirements for
 1659 elements of this class.

1660 **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 *

1661 **10.18 CIM_OwningCollectionElement**

1662 CIM_OwningCollectionElement is used to associate instances of CIM_FilterCollection with an instance of
 1663 CIM_IndicationService. The existence of an instance of CIM_OwningCollectionElement is conditional on
 1664 the existence of an instance of CIM_FilterCollection. Table 32 contains the requirements for elements of
 1665 this class.

1666 **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 *

1667 **10.19 CIM_RegisteredProfile**

1668 CIM_RegisteredProfile identifies the *Indications Profile* in order for a client to determine whether support
 1669 for indications is supported by the managed system instrumentation. The CIM_RegisteredProfile class is
 1670 defined by the *Profile Registration Profile*. With the exception of the mandatory values specified for the
 1671 elements in Table 33, the behavior of the RegisteredProfile instance is in accordance with the *Profile*
 1672 *Registration Profile*.

1673

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).

1674

10.20 CIM_ServiceAffectsElement

1675 CIM_ServiceAffectsElement is used to associate instances of CIM_IndicationFilter and
 1676 CIM_ListenerDestination with an instance of CIM_IndicationService. The existence of
 1677 CIM_ServiceAffectsElement is conditional on the existence of at least one instance of
 1678 CIM_IndicationFilter, CIM_ListenerDestination, or CIM_FilterCollection. Table 34 contains the
 1679 requirements for elements of this class.

1680

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 *

1681

ANNEX A (informative)

Profiles That Define Indications

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1687 Profiles that define indications document support in the following ways:

- 1688 • Profiles shall define supported events in terms of lifecycle and alert indications within the “CIM
1689 Elements” table of the profile specification.
- 1690 • A row included in the “Referenced Profiles” table of the “Synopsis” clause that specifies the
1691 *Indications Profile*. The “Relationship” column in the table contains *Mandatory* if mandatory
1692 indications are specified in the profile being defined.
- 1693 • Normative text provided in the “Implementation” clause of the profile being defined, listing the
1694 indications being specified in the profile and in what circumstances they can be produced.
- 1695 • The “CIM Elements” table in the “CIM Elements” clause of the profile being defined contains an
1696 entry for each indication being specified. The entry consists of the query for the indication;
1697 whether it is mandatory, conditional, or optional; and a description of the indication. Additionally,
1698 if a profile requires an instance of CIM_IndicationFilter to be instantiated to represent the
1699 indication, a subclause in Clause 7, "Implementation", is needed to make this normative
1700 requirement.
- 1701 • CIM_IndicationFilter listed as a mandatory, conditional, or optional class within the profile based
1702 on requirements for static filters. Further each profile specifies, per indication definition, whether
1703 it is required that an implementation instantiate an instance of CIM_IndicationFilter for each
1704 indication definition.
- 1705 • CIM_FilterCollection listed as a mandatory, conditional, or optional class within the profile based
1706 on profile requirements.

1707 NOTE: The requirements for backwards compatibility when applied to the specification of indication filters in a profile
1708 are such that once an indication filter has been defined in a profile, all subsequent minor versions of the profile
1709 continue to specify the indication filter, while a subsequent major version may remove the requirement.

1710

**ANNEX B
(informative)****Change Log**1711
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Version	Date	Author	Description
1.0.0a	2007/05/16	Aaron Merkin	Preliminary Standard
1.0.0b	2008/04/30	Steve Hand	First round of comments.
1.0.0c	2008/09/16	Steve Hand	Second round of comments
1.0.0d	2008/10/29	Jim Davis	WG Ballot Comments
1.0.0	2008/11/26	Hemal Shah	Final Release
1.0.0	2008/12/5	Hemal Shah	Final Release after Infrastructure SC ballot.

ANNEX C (informative)

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