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5 **KVM Redirection Profile**

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143

Foreword

144 The *KVM Redirection Profile* (DSP1076) was prepared by the Physical Platform Profiles Working Group
145 of the DMTF.

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

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160

161

Introduction

162 The information in this specification and referenced specifications is intended to be sufficient for a
163 provider or consumer of this data to identify unambiguously the classes, properties, methods, and values
164 that shall be instantiated and manipulated using the DMTF CIM core and common model definitions.

165 The target audience for this specification is implementers who are writing CIM based providers or
166 consumers of management interfaces representing the components described in this document.

167

KVM Redirection Profile

168 1 Scope

169 The *KVM Redirection Profile* extends the management capabilities of referencing profiles and providing
170 the capability to manage KVM (Keyboard, Video and Mouse) console redirections provided by the
171 system.

172 2 Normative References

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

176 DMTF DSP0004, *CIM Infrastructure Specification 2.6*,
177 http://www.dmtf.org/standards/published_documents/DSP0004_2.6.pdf

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

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

182 DMTF DSP1004, *Base Server Profile 1.0*,
183 http://www.dmtf.org/standards/published_documents/DSP1004_1.0.pdf

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

186 DMTF DSP1077, *USB Redirection Profile 1.0*,
187 http://www.dmtf.org/standards/published_documents/DSP1077_1.0.pdf

188 IETF RFC 5234, *Augmented BNF for Syntax Specifications: ABNF*
189 <http://www.ietf.org/rfc/rfc5234.txt>

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

192 3 Terms and Definitions

193 In this document, some terms have a specific meaning beyond the normal English meaning. Those terms
194 are defined in this clause.

195 The terms "shall" ("required"), "shall not," "should" ("recommended"), "should not" ("not recommended"),
196 "may," "need not" ("not required"), "can" and "cannot" in this document are to be interpreted as described
197 in [ISO/IEC Directives, Part 2](#), Annex H. The terms in parenthesis are alternatives for the preceding term,
198 for use in exceptional cases when the preceding term cannot be used for linguistic reasons. Note that
199 [ISO/IEC Directives, Part 2](#), Annex H specifies additional alternatives. Occurrences of such additional
200 alternatives shall be interpreted in their normal English meaning.

201 The terms "clause," "subclause," "paragraph," and "annex" in this document are to be interpreted as
202 described in [ISO/IEC Directives, Part 2](#), Clause 5.

203 The terms "normative" and "informative" in this document are to be interpreted as described in [ISO/IEC](#)
204 [Directives, Part 2](#), Clause 3. In this document, clauses, subclauses, or annexes labeled "(informative)" do
205 not contain normative content. Notes and examples are always informative elements.

206 The terms defined in [DSP0004](#), [DSP0200](#), and [DSP1001](#) apply to this document. The following additional
207 terms are used in this document.

208 3.1

209 **Original Destination**

210 the destination of a KVM console flow prior to it being redirected. The Original Destination is modeled as
211 instances of CIM_Keyboard, CIM_DisplayController and CIM_PointingDevice in this profile but could be
212 potentially another type of logical device.

213 3.2

214 **KVM Console Flow**

215 a KVM console flow is the bidirectional KVM console stream which original flows to the Original
216 Destination. The KVM console flow may be redirected to a new KVM Console Flow destination, which
217 modeled as an instance of CIM_ProtocolEndpoint.

218 3.3

219 **KVM Redirection**

220 composed of an instance of CIM_RedirectionService, an instance of CIM_KVMRedirectionSAP and the
221 instance of the CIM_ServiceAccessBySAP between the two

222 3.4

223 **KVM Redirection Service**

224 the instance of CIM_RedirectionService which is part of a KVM Redirection

225 3.5

226 **KVM Redirection Session**

227 the instance of CIM_KVMRedirectionSAP which is part of a KVM Redirection

228 3.6

229 **Service**

230 a KVM Redirection Service

231 3.7

232 **Session**

233 a KVM Redirection Session

234 3.8

235 **Singular KVM Redirection**

236 a KVM Redirection in which the MaxCurrentEnabledSAPs property of the CIM_RedirectionService
237 instance has a value of 1

238 **4 Symbols and Abbreviated Terms**

239 4.1

240 **KVM**

241 Keyboard, Video and Mouse

242 **5 Synopsis**

243 **Profile Name:** KVM Redirection

244 **Version:** 1.0.1

245 **Organization:** DMTF

246 **CIM Schema Version:** 2.22

247 **Central Class:** CIM_RedirectionService

248 **Scoping Class:** CIM_ComputerSystem

249 The *KVM Redirection Profile* extends the management capability of the referencing profiles by adding the
250 capability to describe KVM Redirections information.

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

252 CIM_RedirectionService shall be the Central Class of this profile. The instance of
253 CIM_RedirectionService shall be the Central Instance of this profile.

254 CIM_ComputerSystem shall be the Scoping Class of this profile. The instance of CIM_ComputerSystem
255 with which the Central Instance is associated via an instance of CIM_HostedService shall be the Scoping
256 Instance of this profile.

257 **Table 1 – Related Profiles**

Profile Name	Organization	Version	Relationship	Behavior
Profile Registration	DMTF	1.0	Mandatory	

258 **6 Description**

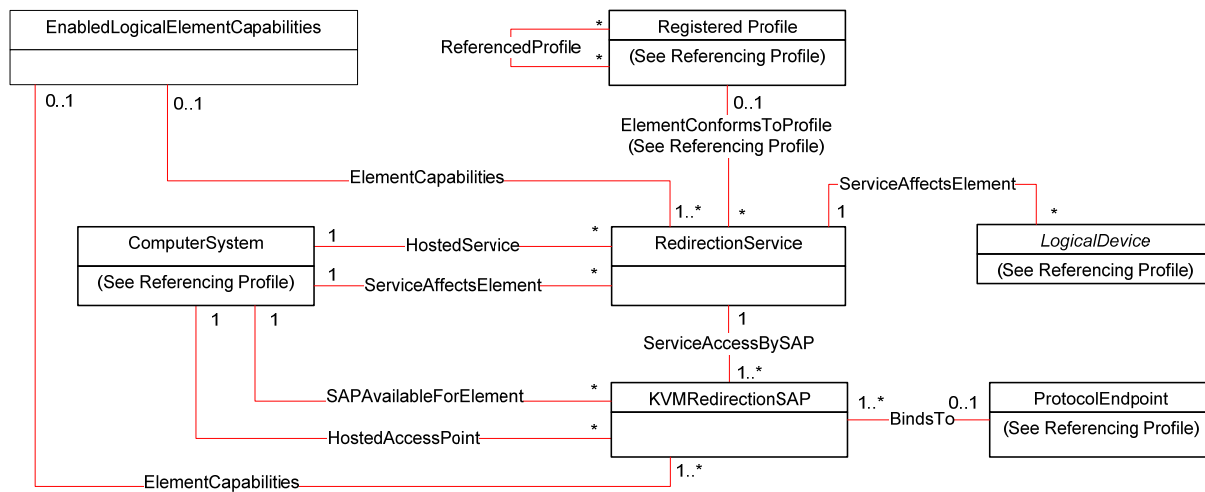
259 The *KVM Redirection Profile* describes the necessary elements needed to provide the capability to
260 manage the redirection of a keyboard, video and mouse (KVM) console flow. The following describes
261 KVM redirection capabilities of typical computer systems which the profile could manage.

- 262 • Systems can have multiple sources of bidirectional KVM console flows which can be redirected.
263 These include keyboards, pointing devices, display controllers or other representations of KVM
264 Logical Devices.
- 265 • Prior to being redirected, the console flow has an Original Destination. This is typically a local
266 keyboard, display controller and pointing device to which a terminal is connected in order to
267 access the KVM console flow.
- 268 • A KVM console flow can be redirected to one or more destinations. A destination can be a
269 network port. The network port facilitates remote access to the KVM console.
- 270 • The redirection of a KVM console flow can be accomplished while still delivering the KVM
271 console flow to its Original Destination.
- 272 • This profile does not represent the state of the underlying session that facilitates the redirection.
273 The representation of the underlying session is beyond the scope of this specification.

274 If the KVM devices are USB Devices and you wish to model them as such, you may use the [USB](#)
275 [Redirection Profile](#) to manage their redirection instead of this profile.

276 Note that a redirected KVM console flow can be terminated by severing the connection over the transport
277 protocol.

278 Figure 1 presents the class diagram for the *KVM Redirection Profile*. For simplicity, the prefix CIM_ has
 279 been removed from the name of the classes.



280

281

Figure 1 – KVM Redirection Profile Class Diagram

282 A KVM Redirection comprises a KVM Redirection Service, a KVM Redirection Session, and the
 283 relationship between them.

- 284 • The KVM Redirection Service, also referred to as Service in this profile, is represented by an
 285 instance of CIM_RedirectionService.
- 286 • The KVM Redirection Session, also referred to as Session in this profile, is represented by an
 287 instance of CIM_KVMRedirectionSAP.
- 288 • The relationship between the Service and the Session is represented by an instance of
 289 CIM_ServiceAccessBySAP.

290 A KVM Redirection can be in an active, inactive or available state. When the KVM Redirection is active,
 291 the KVM Console Flow is being actively redirected to a remote console.

292 The state management of the KVM Redirection can be performed using one of two mechanisms. The first
 293 mechanism is via state management of the Session only. The second mechanism is via state
 294 management of both the Service and the Session.

295 When state management of the Service is possible, the Service can be in an enabled or disabled state.
 296 When state management of the Session is possible, the Session can be in an enabled, disabled, or
 297 enabled but offline state.

298 An instance of CIM_RedirectionService can be associated to an instance of a concrete subclass of
 299 CIM_LogicalDevice which represents the Original Destination of the redirected KVM Console Flow.
 300 Examples of Original Destinations are keyboards, display controllers and pointing devices.

301 An instance of CIM_KVMRedirectionSAP can be associated to an instance of CIM_ProtocolEndpoint
 302 which represents the endpoint where the redirected KVM console flow can be accessed.

303 7 Implementation Requirements

304 This clause describes the classes required by the profile and the class properties required by the profile.
 305 Clause 8 describes the class methods required by the profile.

306 **7.1 Representing a KVM Redirection**

307 A KVM Redirection comprises an instance of CIM_RedirectionService, an instance of
308 CIM_KVMRedirectionSAP and an instance of the CIM_ServiceAccessBySAP association.

309 An instance of CIM_ServiceAccessBySAP shall be used to associate the instance of
310 CIM_RedirectionService to the instance of CIM_KVMRedirectionSAP.

311 The CIM_ServiceAccessBySAP association's Antecedent property shall reference the
312 CIM_RedirectionService instance and its Dependent property shall reference the
313 CIM_KVMRedirectionSAP instance.

314 **7.2 CIM_RedirectionService.RedirectionServiceType**

315 The CIM_RedirectionService.RedirectionServiceType property shall be set to 3 (KVM).

316 **7.3 Representing the KVM Redirection Service**

317 An instance of CIM_RedirectionService shall be used to represent the KVM Redirection Service, or
318 Service.

319 There shall be an instance of the CIM_HostedService association that associates each instance of
320 CIM_RedirectionService to a hosting CIM_ComputerSystem instance.

321 The CIM_HostedService association's Antecedent property shall reference the CIM_ComputerSystem
322 instance and its Dependent property shall reference the CIM_RedirectionService instance.

323 **7.3.1 Representing the Original Destination**

324 The instance of CIM_RedirectionService may be associated to one or more instances of a concrete
325 subclass of CIM_LogicalDevice which represents the Original Destination. The association shall use an
326 instance of the CIM_ServiceAffectsElement association.

327 The CIM_ServiceAffectsElement association's ManagedElement property shall reference the instance of
328 a concrete subclass CIM_LogicalDevice instance and its Service property shall reference the instance of
329 CIM_RedirectionService.

330 **7.3.2 Representing the System wherein the Original Destination Resides**

331 The instance of CIM_RedirectionService shall be associated to an instance of CIM_ComputerSystem
332 which represents the system wherein the Original Destination resides. The association shall use an
333 instance of the CIM_ServiceAffectsElement association.

334 The CIM_ServiceAffectsElement association's ManagedElement property shall reference the
335 CIM_ComputerSystem instance and its Service property shall reference the CIM_RedirectionService
336 instance.

337 **7.3.3 KVM Console Sharing Mode**

338 When a KVM console flow is redirected, the redirection may be exclusive or shared. Shared redirection
339 means the original destination of the KVM console is still receiving the KVM console flow. Exclusive
340 redirection means that the original destination is no longer receiving the KVM console flow.

341 The CIM_RedirectionService.SharingMode property shall designate whether a KVM Redirection is
342 exclusive or shared. A value of 2 (Exclusive) for the SharingMode property shall indicate exclusive
343 redirection. A value of 3 (Shared) for the SharingMode property shall indicate shared redirection.

344 **7.3.4 KVM Sharing Mode Control Capability**

345 KVM Sharing Mode may be controlled.

346 When KVM Sharing Mode control is supported, an instance of CIM_RedirectionServiceCapabilities shall
347 exist and the CIM_RedirectionServiceCapabilities.SharingModeSupported property shall designate
348 whether a KVM Redirection is capable of being set to exclusive or shared mode.

349 A value of 2 (Exclusive) for the SharingMode property shall indicate that exclusive redirection may be set
350 on the KVM Redirection.

351 A value of 3 (Shared) for the SharingModeSupported property shall indicate that shared redirection may
352 be set on the KVM Redirection.

353 **7.3.5 Maximum Number of Concurrent Redirections**

354 A KVM console flow may be redirected to multiple access points; however, there may be a limitation to
355 the number of concurrent redirections. The limitation could be the result of hardware or software resource
356 limitations.

357 The CIM_RedirectionService.MaxCurrentEnabledSAPs property shall contain the maximum number of
358 instances of CIM_KVMRedirectionSAP, whose EnabledState property is set to 2 (Enabled), which may be
359 associated to the instance of CIM_RedirectionService. The Original Destination shall not be counted as
360 one of the redirected KVM consoles.

361 A Singular KVM Redirection is a redirection whose instance of CIM_RedirectionService has a
362 MaxCurrentEnabledSAPs property with a value of 1.

363 **7.3.6 CIM_RedirectionService.ElementName**

364 The ElementName property shall be formatted as a free-form string of variable length (pattern “.*”).

365 The ElementName property may support being modified via the ModifyInstance operation. See 8.11.1.1.
366 This behavior is conditional. The following subclauses describe the CIM elements and behavior required
367 to determine whether an implementation supports client modification of the ElementName property.

368 **7.3.6.1 Modifying ElementName Is Supported — Conditional**

369 This subclause describes the CIM elements and behavior requirements when an implementation supports
370 client modification of the CIM_RedirectionService.ElementName property.

371 There shall be an instance of CIM_RedirectionServiceCapabilities associated with the
372 CIM_RedirectionService instance via an instance of the CIM_ElementCapabilities association.

373 The CIM_RedirectionServiceCapabilities.ElementNameEditSupported property shall have a value of
374 TRUE.

375 The CIM_RedirectionServiceCapabilities.MaxElementNameLen property shall be implemented.

376 **7.3.6.2 Modifying ElementName Is Not Supported**

377 This subclause describes the CIM elements and behaviors that shall be implemented when the
378 CIM_RedirectionService.ElementName does not support being modified via the ModifyInstance
379 operation.

380 There may be an instance of CIM_RedirectionServiceCapabilities associated with the
381 CIM_RedirectionServiceCapabilities instance via an instance of CIM_ElementCapabilities.

382 When an instance of CIM_RedirectionServiceCapabilities exists, its ElementNameEditSupported
383 property shall have a value of FALSE.

384 When an instance of CIM__RedirectionServiceCapabilities exists, its MaxElementNameLen property may
385 be implemented. The MaxElementNameLen property is irrelevant in this context.

386 **7.4 Representing the KVM Redirection Session**

387 An instance of CIM_KVMRedirectionSAP shall be used to represent the KVM Redirection Session, or
388 simply "Session" as defined in clause 3.

389 The Session is associated to computer systems via two associations. One is the computer system whose
390 KVM console flow is being redirected. The other is the computer system which contains the endpoint
391 where the redirected KVM console flow can be accessed.

392 The instance of CIM_KVMRedirectionSAP shall be associated to an instance of CIM_ComputerSystem,
393 which represents the computer system whose KVM console flow is being redirected, via an instance of
394 CIM_SAPAvailableForElement.

395 The CIM_SAPAvailableForElement association's ManagedElement property shall reference the
396 CIM_ComputerSystem instance and its AvailableSAP property shall reference the
397 CIM_KVMRedirectionSAP instance.

398 The instance of CIM_KVMRedirectionSAP shall be associated to an instance of CIM_ComputerSystem,
399 which represents the computer system which contains the endpoint where the redirect KVM console flow
400 can be accessed, via an instance of CIM_HostedAccessPoint.

401 The CIM_HostedAccessPoint association's Antecedent property shall reference the
402 CIM_ComputerSystem instance and its Dependent property shall reference the
403 CIM_KVMRedirectionSAP instance.

404 **7.4.1 Representing the Destination of the Redirected KVM Console Flow**

405 The instance of CIM_KVMRedirectionSAP may be associated to at most one instance of
406 CIM_ProtocolEndpoint which represents the endpoint where the redirected KVM console flow is
407 accessed. The association shall use an instance of the CIM_BindsTo association.

408 The CIM_BindsTo association's Antecedent property shall reference the CIM_ProtocolEndpoint instance
409 and its Dependent property shall reference the CIM_KVMRedirectionSAP instance.

410 **7.4.2 KVM Console Protocol Format**

411 The redirected KVM console can be formatted. Examples of the KVM console formats are raw data
412 stream and protocols such as RDP or VNC. In raw character stream format, the characters have no
413 special meaning. In protocol mode format, the data stream is formatted to have special meaning
414 according to the definition of the protocol.

415 The format of the redirection KVM console protocol shall be designated by the
416 CIM_KVMRedirectionSAP.KVMProtocol property.

417 When the redirected KVM console protocol format is a raw data stream, the
418 CIM_KVMRedirectionSAP.KVMProtocol property shall be set to a value of 2 (Raw).

419 When the redirected KVM console format is using the RDP protocol, the
420 CIM_KVMRedirectionSAP.KVMProtocol property shall be set to a value of 3 (RDP).

421 When the redirected KVM console format is using the VNC protocol, the
422 CIM_KVMRedirectionSAP.KVMProtocol property shall be set to a value of 4 (VNC).

423 When the redirected KVM console format is other than Raw, RDP or VNC, the
424 CIM_KVMRedirectionSAP.KVMProtocol property shall be set to a value of 1 (Other) and the value of
425 CIM_KVMRedirectionSAP.OtherKVMProcol shall contain a string which describes the format.

426 **7.4.3 Terminate a Redirected KVM Console**

427 A redirected KVM console session may be terminated via state management of the KVM Redirection
428 Session. (See 7.5.)

429 **7.4.4 CIM_KVMRedirectionSAP.ElementName**

430 The ElementName property shall be formatted as a free-form string of variable length (pattern “.*”).

431 The ElementName property may support being modified via the ModifyInstance operation. See 8.12.1.1.
432 This behavior is conditional. The following subclauses describe the CIM elements and behavior required
433 to determine whether an implementation supports client modification of the ElementName property.

434 **7.4.4.1 Modifying ElementName Is Supported — Conditional**

435 This subclause describes the CIM elements and behavior requirements when an implementation supports
436 client modification of the CIM_KVMRedirectionSAP.ElementName property.

437 There shall be an instance of CIM_EnabledLogicalElementCapabilities associated with the
438 CIM_KVMRedirectionSAP instance via an instance of the CIM_ElementCapabilities association.

439 The CIM_EnabledLogicalElementCapabilities.ElementNameEditSupported property shall have a value of
440 TRUE.

441 The CIM_EnabledLogicalElementCapabilities.MaxElementNameLen property shall be implemented.

442 **7.4.4.2 Modifying ElementName Is Not Supported**

443 This subclause describes the CIM elements and behaviors that shall be implemented when the
444 CIM_KVMRedirectionSAP.ElementName does not support being modified via the ModifyInstance
445 operation.

446 There may be an instance of CIM_EnabledLogicalElementCapabilities associated with the
447 CIM_KVMRedirectionSAP instance via an instance of CIM_ElementCapabilities.

448 When an instance of CIM_EnabledLogicalElementCapabilites exists, its ElementNameEditSupported
449 property shall have a value of FALSE.

450 When an instance of CIM_EnabledLogicalElementCapabilities exists, its MaxElementNameLen property
451 may be implemented. The MaxElementNameLen property is irrelevant in this context.

452 **7.5 State Management of a KVM Redirection**

453 The KVM Redirection shall have the states inactive, available, or active:

- 454 • The KVM Redirection is inactive when the KVM Console Flow is not being redirected to the
455 Session.
- 456 • The KVM Redirection is available when the KVM Console Flow is being redirected to the Session,
457 but the session is not actively being used.
- 458 • The KVM Redirection is active when the KVM Console Flow is being actively redirected to the
459 Session and the session is actively being used.

460 The state of a KVM Redirection shall be reported by the implementation using the combined states of the
461 instance of CIM_RedirectionService (Service) and the instance of CIM_KVMRedirectionSAP (Session)
462 associated via an instance of CIM_ServiceAccessBySAP, as follows:

- 463 • When the value of CIM_RedirectionService.EnabledState is 2 (Enabled) and the value of
464 CIM_KVMRedirectionSAP.EnabledState is 2 (Enabled), the KVM Redirection shall be considered
465 in active state.
- 466 • When the value of CIM_RedirectionService.EnabledState is 2 (Enabled) and the value of
467 CIM_KVMRedirectionSAP.EnabledState is 6 (Enabled but Offline), the KVM Redirection shall be
468 considered in available state.
- 469 • Otherwise, the KVM Redirection shall be considered in inactive state.

470 Table 2 provides details about conditions and KVM Redirection state.

471 **Table 2 – Determining KVM Redirection State**

Condition	State	Description
CIM_RedirectionService.EnabledState = 3 (Disabled) OR CIM_KVMRedirectionSAP.EnabledState = 3 (Disabled)	inactive	Service and Service Access Point have not both been enabled. KVM Console Flow is not being redirected.
CIM_RedirectionService.EnabledState = 2 (Enabled) AND CIM_KVMRedirectionSAP.EnabledState = 6 (Enabled but Offline)	available	Service and Service Access Point have both been enabled. KVM Console Flow is not currently being redirected.
CIM_RedirectionService.EnabledState = 2 (Enabled) AND CIM_KVMRedirectionSAP.EnabledState = 2 (Enabled)	active	Both Service and Service Access Point have been enabled. KVM Console Flow is currently being redirected and the session is actively being used.

472 The state of the KVM Redirection may be affected using: 1) state management of the Session only or 2)
473 state management of both the Service and the Session. The state of the KVM Redirection may also be
474 affected by external interactions and events (for example, when a management console application
475 begins active use of a session). Note that a session may be considered as being actively used by the
476 implementation even when the flow of data may appear “idle”.

477 The state management of the Service is discussed in 7.6. The state management of the Session is
478 discussed in 7.7.

479 **7.6 State Management of a KVM Redirection Service (Optional)**

480 Support for managing the state of a KVM Redirection Service is optional behavior. The following
481 subclauses describe the CIM elements and behaviors that allow the client to determine whether state
482 management of the KVM Redirection Service is supported.

483 **7.6.1 KVM Redirection Service State Management Is Supported — Conditional**

484 This subclause describes the CIM elements and behaviors that shall be implemented when state
485 management of the Service is supported.

486 7.6.1.1 CIM_RedirectionServiceCapabilities

487 When state management of the KVM Redirection Service is supported, exactly one instance of
488 CIM_RedirectionServiceCapabilities shall be associated with the instance of CIM_RedirectionService
489 through an instance of CIM_ElementCapabilities.

490 The CIM_ElementCapabilities association's ManagedElement property shall reference the
491 CIM_RedirectionService instance and its Capabilities property shall reference the
492 CIM_RedirectionServiceCapabilities instance.

493 7.6.1.1.1 CIM_RedirectionServiceCapabilities.RequestedStatesSupported

494 The RequestedStatesSupported property shall contain zero or more of the following values: 2 (Enabled),
495 3 (Disabled).

496 7.6.1.2 CIM_RedirectionService.RequestedState

497 When the CIM_RedirectionService.RequestStateChange() method is successfully invoked, the value of
498 the RequestedState property shall be the value of the RequestedState parameter. If the method is not
499 successfully invoked, the value of the RequestedState property is indeterminate.

500 The CIM_RedirectionService.RequestedState property shall have one of the values specified in the
501 CIM_RedirectionServiceCapabilities.RequestedStatesSupported property or a value of 5 (No Change).

502 7.6.1.3 CIM_RedirectionService.EnabledState

503 The EnabledState property shall have one of the following values: 2 (Enabled), 3 (Disabled).

504 When the RequestedState parameter has a value of 2 (Enabled) or 3 (Disabled) and the
505 CIM_RedirectionService.RequestStateChange() method completes successfully, the value of the
506 EnabledState property shall equal the value of the CIM_RedirectionService.RequestedState property.

507 If the method does not complete successfully, the value of the EnabledState property is indeterminate.

508 7.6.2 KVM Redirection Service State Management Is Not Supported

509 This subclause describes the CIM elements and behaviors that shall be implemented when management
510 of the Service state is not supported.

511 7.6.2.1 CIM_RedirectionServiceCapabilities

512 When state management is not supported, an instance of CIM_RedirectionServiceCapabilities may be
513 associated with the CIM_RedirectionService instance through an instance of CIM_ElementCapabilities.
514 The existence of the CIM_ElementCapabilities instance is conditional on the existence of the
515 CIM_RedirectionServiceCapabilities instance.

516 The CIM_ElementCapabilities association's ManagedElement property shall reference the
517 CIM_RedirectionService instance and its Capabilities property shall reference the
518 CIM_RedirectionServiceCapabilities instance.

519 7.6.2.1.1 CIM_RedirectionServiceCapabilities.RequestedStatesSupported

520 The CIM_RedirectionServiceCapabilities.RequestedStatesSupported property shall not contain any
521 values.

522 7.6.2.2 CIM_RedirectionService.RequestedState

523 The RequestedState property shall have the value of 12 (Not Applicable).

524 **7.6.2.3 CIM_RedirectionService.EnabledState**

525 The EnabledState property shall have one of the following values: 2 (Enabled) 3 (Disabled) or 5 (Not
526 Applicable). The value of 5 (Not Applicable) may be set when non-CIM instrumentation has manipulated
527 the instance of CIM_RedirectionService.

528 **7.7 State Management of a KVM Redirection Session (Optional)**

529 Support for managing the state of a KVM Redirection Session (Session) is optional behavior. The
530 following subclauses describe the CIM elements and behaviors that allow the client to determine whether
531 state management of the Session is supported.

532 **7.7.1 Session State Management Is Supported — Conditional**

533 This subclause describes the CIM elements and behaviors that shall be implemented when state
534 management of the Session is supported.

535 **7.7.1.1 CIM_EnabledLogicalElementCapabilities**

536 When state management of the Session is supported, exactly one instance of
537 CIM_EnabledLogicalElementCapabilities shall be associated with each instance of
538 CIM_KVMRedirectionSAP through an instance of CIM_ElementCapabilities.

539 The CIM_ElementCapabilities association's ManagedElement property shall reference the
540 CIM_KVMRedirectionSAP instance and its Capabilities property shall reference the
541 CIM_EnabledLogicalElementCapabilities instance.

542 **7.7.1.1.1 CIM_EnabledLogicalElementCapabilities.RequestedStatesSupported**

543 The RequestedStatesSupported property shall contain zero or more of the following values: 2 (Enabled),
544 3 (Disabled) or 6 (Enabled but Offline).

545 **7.7.1.2 CIM_KVMRedirectionSAP.RequestedState**

546 When the CIM_KVMRedirectionSAP.RequestStateChange() method is successfully invoked, the value of
547 the RequestedState property shall be the value of the RequestedState parameter. If the method is not
548 successfully invoked, the value of the RequestedState property is indeterminate.

549 The CIM_KVMRedirectionSAP.RequestedState property shall have one of the values specified in the
550 CIM_EnabledLogicalElementCapabilities.RequestedStatesSupported property or a value of 5 (No
551 Change).

552 **7.7.1.3 CIM_KVMRedirectionSAP.EnabledState**

553 The EnabledState property shall have one of the following values: 2 (Enabled), 3 (Disabled) or 6 (Enabled
554 but Offline). Note that the value of EnabledState is affected by the RequestStateChange() method and
555 the current state of the KVM Redirection and Console Flow (see 7.5).

556 When the RequestedState parameter has a value of 2 (Enabled) and the
557 CIM_KVMRedirectionSAP.RequestStateChange() method completes successfully, the value of the
558 EnabledState property shall equal either 2 (Enabled) or 6 (Enabled but Offline).

559 When the RequestedState parameter has a value of 6 (Enabled but Offline) and the
560 CIM_KVMRedirectionSAP.RequestStateChange() method completes successfully, the value of the
561 EnabledState property shall equal either 2 (Enabled) or 6 (Enabled but Offline).

562 When the RequestedState parameter has a value of 3 (Disabled) and the
563 CIM_KVMRedirectionSAP.RequestStateChange() method completes successfully, the value of the
564 EnabledState property shall equal 3 (Disabled).

565 If the method does not complete successfully, the value of the EnabledState property is indeterminate.

566 **7.7.2 Session State Management Is Not Supported**

567 This subclause describes the CIM elements and behaviors that shall be implemented when management
568 of the Session state is not supported.

569 **7.7.2.1 CIM_EnabledLogicalElementCapabilities**

570 When state management of the Session is not supported, an instance of
571 CIM_EnabledLogicalElementCapabilities may be associated with the CIM_KVMRedirectionSAP instance
572 through an instance of CIM_ElementCapabilities. The existence of the CIM_ElementCapabilities instance
573 is conditional on the existence of the CIM_EnabledLogicalElementCapabilities instance.

574 The CIM_ElementCapabilities association's ManagedElement property shall reference the
575 CIM_KVMRedirectionSAP instance and its Capabilities property shall reference the
576 CIM_EnabledLogicalElementCapabilities instance.

577 **7.7.2.1.1 CIM_EnabledLogicalElementCapabilities.RequestedStatesSupported**

578 The CIM_EnabledLogicalElementCapabilities.RequestedStatesSupported property shall not contain any
579 values.

580 **7.7.2.2 CIM_KVMRedirectionSAP.RequestedState**

581 The RequestedState property shall have the value of 12 (Not Applicable).

582 **7.7.2.3 CIM_KVMRedirectionSAP.EnabledState**

583 The EnabledState property shall have one of the following values: 2 (Enabled), 3 (Disabled), 5 (Not
584 Applicable), or 6 (Enabled but Offline). The value of 5 (Not Applicable) may be set when non-CIM
585 instrumentation has manipulated the instance of CIM_KVMRedirectionSAP.

586 **8 Methods**

587 **8.1 CIM_RedirectionService.RequestStateChange()**

588 Invocation of the RequestStateChange() method changes the element's state to the value specified in the
589 RequestedState parameter. The 2 (Enabled), and 3 (Disabled) values of the RequestedState parameter
590 shall correspond to the enabled and disabled states of the KVM Redirection Service, respectively.

591 It is implementation specific whether the method will complete successfully if there are active sessions.

592 Detailed requirements of the RequestStateChange() method are specified in Table 3 and Table 4.

593 No standard messages are defined.

594 Invoking the RequestStateChange() method multiple times could result in earlier requests being
595 overwritten or lost.

596 **Table 3 – CIM_RedirectionService.RequestStateChange() Method: Return Code Values**

Value	Description
0	Request was successfully executed.
1	Method is unsupported.
2	Error occurred
4096	Job started: REF returned to started CIM_ConcreteJob

597 **Table 4 – CIM_RedirectionService.RequestStateChange() Method: Parameters**

Qualifiers	Name	Type	Description/Values
IN	RequestedState	uint16	Valid state values: 2 (Enabled) 3 (Disabled)
OUT	Job	CIM_ConcreteJob REF	Returned if job started
IN	TimeoutPeriod	datetime	Client specified maximum amount of time the transition to a new state is supposed to take: 0 or NULL – No time requirements <interval> – Maximum time allowed

598 **8.1.1 CIM_RedirectionService.RequestStateChange() — Conditional Support**

599 When an instance of CIM_RedirectionServiceCapabilities is associated with the CIM_RedirectionService
600 instance and the CIM_RedirectionServiceCapabilities.RequestedStatesSupported property contains at
601 least one value, the CIM_RedirectionService.RequestStateChange() method shall be implemented and
602 supported. The CIM_RedirectionService.RequestStateChange() method shall not return a value of 1 (Not
603 Supported).

604 **8.2 CIM_KVMRedirectionSAP.RequestStateChange()**

605 Invocation of the RequestStateChange() method changes the element’s state to the value specified in the
606 RequestedState parameter. The 2 (Enabled), 3 (Disabled) and 6 (Enabled but Offline) values of the
607 RequestedState parameter shall correspond to enabling, disabling, and enabled but offline states the
608 Session, respectively.

609 Detailed requirements of the RequestStateChange() method are specified in Table 5 and Table 6.

610 No standard messages are defined.

611 Invoking the RequestStateChange() method multiple times could result in earlier requests being
612 overwritten or lost.

613 **Table 5 – CIM_KVMRedirectionSAP.RequestStateChange() Method: Return Code Values**

Value	Description
0	Request was successfully executed.
1	Method is unsupported.
2	Error occurred
4096	Job started: REF returned to started CIM_ConcreteJob

614

Table 6 – CIM_KVMRedirectionSAP.RequestStateChange() Method: Parameters

Qualifiers	Name	Type	Description/Values
IN	RequestedState	uint16	Valid state values: 2 (Enabled) 3 (Disabled) 6 (Enabled but Offline)
OUT	Job	CIM_ConcreteJob REF	Returned if job started
IN	TimeoutPeriod	datetime	Client specified maximum amount of time the transition to a new state is supposed to take: 0 or NULL – No time requirements <interval> – Maximum time allowed

615 **8.2.1 CIM_KVMRedirectionSAP.RequestStateChange() — Conditional Support**

616 When an instance of CIM_EnabledLogicalElementCapabilities is associated with the
 617 CIM_KVMRedirectionSAP instance and the
 618 CIM_EnabledLogicalElementCapabilities.RequestedStatesSupported property contains at least one
 619 value, the CIM_KVMRedirectionSAP.RequestStateChange() method shall be implemented and
 620 supported. The CIM_KVMRedirectionSAP.RequestStateChange() method shall not return a value of 1
 621 (Not Supported).

622 **8.2.2 Enabling a Singular KVM Redirection**

623 When multiple instances of CIM_KVMRedirectionSAP are associated with an instance of
 624 CIM_RedirectionService, the service shall guarantee that the number of CIM_KVMRedirectionSAP with
 625 the value of EnabledState as 2 (Enabled) do not exceed the MaxCurrentEnabledSAPs property value.
 626 When CIM_KVMRedirectionSAP.RequestedState parameter has a value of 2 (Enabled) and there are
 627 MaxCurrentEnabledSAPs instances of CIM_KVMRedirectionSAP with the value of EnabledState as 2
 628 (Enabled), then CIM_KVMRedirectionSAP.RequestStateChange() shall complete with an error.

629 When the instance of CIM_KVMRedirectionSAP is associated to an instance of CIM_RedirectionService
 630 whose MaxCurrentEnabledSAPs property has a value of 1, the method shall exhibit the following
 631 additional behavior.

632 When the CIM_KVMRedirectionSAP.RequestedState parameter has a value of 2 (Enabled) and the
 633 CIM_KVMRedirectionSAP.RequestStateChange() method completes successfully, the value of the
 634 EnabledState property of all other instances of CIM_KVMRedirectionSAP associated with the instance of
 635 CIM_RedirectionService shall be set to 3 (Disabled).

636 **8.3 Profile Conventions for Operations**

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

639 The default list of operations is as follows:

- 640 • GetInstance
- 641 • Associators
- 642 • AssociatorNames
- 643 • References
- 644 • ReferenceNames

- 645 • EnumerateInstances
- 646 • EnumerateInstanceNames

647 **8.4 CIM_BindsTo Operations**

648 Table 7 lists implementation requirements for operations. If implemented, these operations shall be
 649 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 7, all operations in
 650 the default list in 8.3 shall be implemented as defined in [DSP0200](#).

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

652 **Table 7 – CIM_BindsTo Operations**

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

653 **8.5 CIM_ElementCapabilities Operations**

654 Table 8 lists implementation requirements for operations. If implemented, these operations shall be
 655 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 8, all operations in
 656 the default list in 8.3 shall be implemented as defined in [DSP0200](#).

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

658 **Table 8 – CIM_ElementCapabilities Operations**

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

659 **8.6 CIM_RedirectionServiceCapabilities Operations**

660 Table 9 lists implementation requirements for operations. If implemented, these operations shall be
 661 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 9, all operations in
 662 the default list in 8.3 shall be implemented as defined in [DSP0200](#).

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

664

Table 9 – CIM_RedirectionServiceCapabilities Operations

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

665 8.7 CIM_HostedService Operations

666 Table 10 lists implementation requirements for operations. If implemented, these operations shall be
 667 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 10, all operations
 668 in the default list in 8.3 shall be implemented as defined in [DSP0200](#).

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

670

Table 10 – CIM_HostedService Operations

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

671 8.8 CIM_HostedAccessPoint Operations

672 Table 11 lists implementation requirements for operations. If implemented, these operations shall be
 673 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 11, all operations
 674 in the default list in 8.3 shall be implemented as defined in [DSP0200](#).

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

676

Table 11 – CIM_HostedAccessPoint Operations

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

677 8.9 CIM_ServiceAffectsElement Operations

678 Table 12 lists implementation requirements for operations. If implemented, these operations shall be
 679 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 12, all operations
 680 in the default list in 8.3 shall be implemented as defined in [DSP0200](#).

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

682

Table 12 – CIM_ServiceAffectsElement Operations

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

683 **8.10 CIM_ServiceAccessBySAP Operations**

684 Table 13 lists implementation requirements for operations. If implemented, these operations shall be
 685 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 13, all operations
 686 in the default list in 8.3 shall be implemented as defined in [DSP0200](#).

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

688

Table 13 – CIM_ServiceAccessBySAP Operations

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

689 **8.11 CIM_RedirectionService Operations**

690 Table 14 lists implementation requirements for operations. If implemented, these operations shall be
 691 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 14, all operations
 692 in the default list in 8.3 shall be implemented as defined in [DSP0200](#).

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

694

Table 14 – CIM_RedirectionService Operations

Operation	Requirement	Messages
GetInstance	Mandatory	None
ModifyInstance	Optional	See 8.11.1.
Associators	Unspecified	None
AssociatorNames	Unspecified	None
References	Unspecified	None
ReferenceNames	Unspecified	None

695 **8.11.1 CIM_RedirectionService — ModifyInstance Operation**

696 This subclause details the specific requirements for the ModifyInstance operation applied to an instance
 697 of CIM_RedirectionService.

698 **8.11.1.1 CIM_RedirectionService.ElementName property**

699 When there is an instance of CIM_RedirectionServiceCapabilities associated with the
 700 CIM_RedirectionService instance and the
 701 CIM_RedirectionServiceCapabilities.ElementNameEditSupported property has a value of TRUE, the
 702 implementation shall allow the ModifyInstance operation to change the value of the ElementName
 703 property of the CIM_RedirectionService instance. The ModifyInstance operation shall enforce the length
 704 restriction specified in the MaxElementNameLen property of the CIM_RedirectionServiceCapabilities.

705 When there is not an instance of CIM_RedirectionServiceCapabilities associated with the
 706 CIM_RedirectionService instance, or the ElementNameEditSupported property of the
 707 CIM_RedirectionServiceCapabilities has a value of FALSE, the implementation shall not allow the
 708 ModifyInstance operation to change the value of the ElementName property of the
 709 CIM_RedirectionService instance.

710 **8.12 CIM_KVMRedirectionSAP Operations**

711 Table 15 lists implementation requirements for operations. If implemented, these operations shall be
 712 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 15, all operations
 713 in the default list in 8.3 shall be implemented as defined in [DSP0200](#).

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

715 **Table 15 – CIM_KVMRedirectionSAP Operations**

Operation	Requirement	Messages
GetInstance	Mandatory	None
ModifyInstance	Optional	See 8.12.1.
Associators	Unspecified	None
AssociatorNames	Unspecified	None
References	Unspecified	None
ReferenceNames	Unspecified	None

716 **8.12.1 CIM_KVMRedirectionSAP — ModifyInstance Operation**

717 This subclause details the specific requirements for the ModifyInstance operation applied to an instance
 718 of CIM_KVMRedirectionSAP.

719 **8.12.1.1 CIM_KVMRedirectionSAP.ElementName property**

720 When there is an instance of CIM_EnabledLogicalElementCapabilities associated with the
 721 CIM_KVMRedirectionSAP instance and the
 722 CIM_EnabledLogicalElementCapabilities.ElementNameEditSupported property has a value of TRUE, the
 723 implementation shall allow the ModifyInstance operation to change the value of the ElementName
 724 property of the CIM_KVMRedirectionSAP instance. The ModifyInstance operation shall enforce the length
 725 restriction specified in the MaxElementNameLen property of the
 726 CIM_EnabledLogicalElementCapabilities.

727 When there is not an instance of CIM_EnabledLogicalElementCapabilities associated with the
 728 CIM_KVMRedirectionSAP instance, or the ElementNameEditSupported property of the
 729 CIM_EnabledLogicalElementCapabilities has a value of FALSE, the implementation shall not allow the
 730 ModifyInstance operation to change the value of the ElementName property of the
 731 CIM_KVMRedirectionSAP instance.

732 **9 Use Cases**

733 This subclause contains object diagrams and use cases specific to *KVM Redirection Profile*. The use
 734 cases are informative and are not intended to define the requirements for conformance.

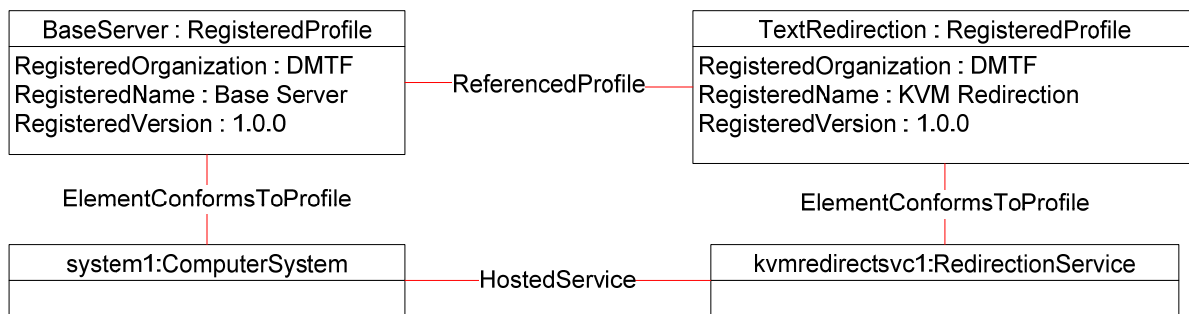
735 **9.1 Advertising the Profile Conformance**

736 The object diagram in Figure 2 shows how instances of CIM_RegisteredProfile are used to identify the
 737 version of the *KVM Redirection Profile* with which an instance of CIM_RedirectionService and its
 738 associated instances are conformant.

739 An instance of CIM_RegisteredProfile exists for each profile that is instrumented in the system. One
 740 instance of CIM_RegisteredProfile identifies the DMTF [Base Server Profile](#), version 1.0.0. The other
 741 instance identifies the DMTF *KVM Redirection Profile*, version 1.0.0. The Central Instance is the
 742 CIM_RedirectionService. The Scoping Instance is the CIM_ComputerSystem instance.

743 This instance of CIM_ComputerSystem is conformant with the DMTF [Base Server Profile](#) version 1.0.0 as
 744 indicated by the CIM_ElementConformsToProfile association to the CIM_RegisteredProfile instance.

745 This instance of CIM_RedirectionService is conformant with the DMTF *KVM Redirection Profile* version
 746 1.0.0 as indicated by the CIM_ElementConformsToProfile association to the CIM_RegisteredProfile
 747 instance.



748

749

Figure 2 – Registered Profile

750 **9.2 Object Diagram for a Monolithic Server**

751 Figure 3 shows the object diagram for a monolithic server, *system1*, which has a Service which can
 752 redirect the KVM console devices to the network port. Both the KVM devices and the network port are
 753 part of *system1* and modeled by the instances of CIM_SystemDevice.

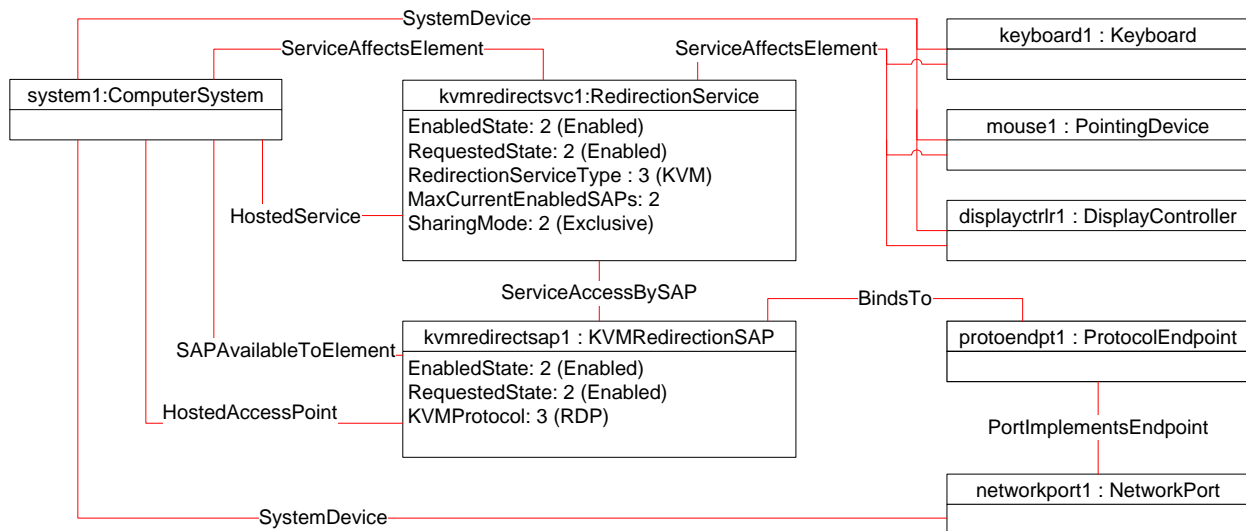
754 The KVM console session is represented with a source (*kvmredirectsvc1*), a destination
 755 (*kvmredirectsap1*) and the instance of CIM_ServiceAccessBySAP association between them. The KVM
 756 Redirection Service (*kvmredirectsvc1*) is hosted on *system1* as represented by the CIM_HostedService
 757 association between *system1* and *kvmredirectsvc1*. The service (*kvmredirectsvc1*) affects *system1* as
 758 represented by the CIM_ServiceAffectsElement association between *system1* and *kvmredirectsvc1*. This
 759 signifies that *system1* is the source of the KVM console which can be redirected.

760 The service also affects *keyboard1*, *displayctrlr1* and *mouse1* as represented by the
 761 CIM_ServiceAffectsElement association between *keyboard1*, *displayctrlr1* and *mouse1* and
 762 *kvmredirectsvc1*. *Keyboard1* is an instance of CIM_Keyboard, *displayctrlr1* is an instance of
 763 CIM_DisplayController and *mouse1* is an instance of CIM_PointingDevice, all of which are a concrete
 764 subclass of CIM_LogicalDevice. This signifies that *keyboard1*, *displayctrlr1* and *mouse1* are the Original
 765 Destination of a KVM console which can be redirected.

766 The KVM Redirection Session (*kvmredirectsap1*) is hosted on *system1* as represented by the
 767 CIM_HostedAccessPoint association between *system1* and *kvmredirectsap1*. The Session
 768 (*kvmredirectsap1*) provides a SAP for *system1* as represented by the CIM_SAPAvailableForElement
 769 association between *system1* and *kvmredirectsap1*. Note that any properties, such as encryption
 770 algorithms or settings, for the KVM Protocol's transport can be included on the Protocol Endpoint
 771 *protoendpt1*.

772 From *kvmredirectsap1*, the CIM_BindsTo association can be traversed to the CIM_ProtocolEndpoint
 773 (*protoendpt1*). From *protoendpt1*, the CIM_PortImplementsEndpoint association can be traversed to the
 774 network port (*networkport1*), a device on *system1*.

775 In the figure, the KVM Redirection specified by *kvmredirectsvc1* and *kvmredirectsap1* is active, because
 776 the state of the *kvmredirectsvc1* is 2 (Enabled) and the state of the *kvmredirectsap1* is 2 (Enabled).



777

778 **Figure 3 – Monolithic System Object Diagram**

779 **9.3 Object Diagram for Monolithic Server with Service Processor**

780 Figure 4 shows the object diagram for a monolithic server with a service processor.

781 The diagram is similar to Figure 3, except there is now an instance of CIM_ComputerSystem, *sp1*,
 782 representing the service processor which has a network port.

783 The KVM Redirection Service (*kvmredirectsvc1*) is hosted on *sp1* as represented by the
 784 CIM_HostedService association between *sp1* and *kvmredirectsvc1*.

785 The service affects *system1* as represented by the CIM_ServiceAffectsElement association between
 786 *system1* and *kvmredirectsvc1*. This signifies that *system1* is the source of the KVM console which can be
 787 redirected.

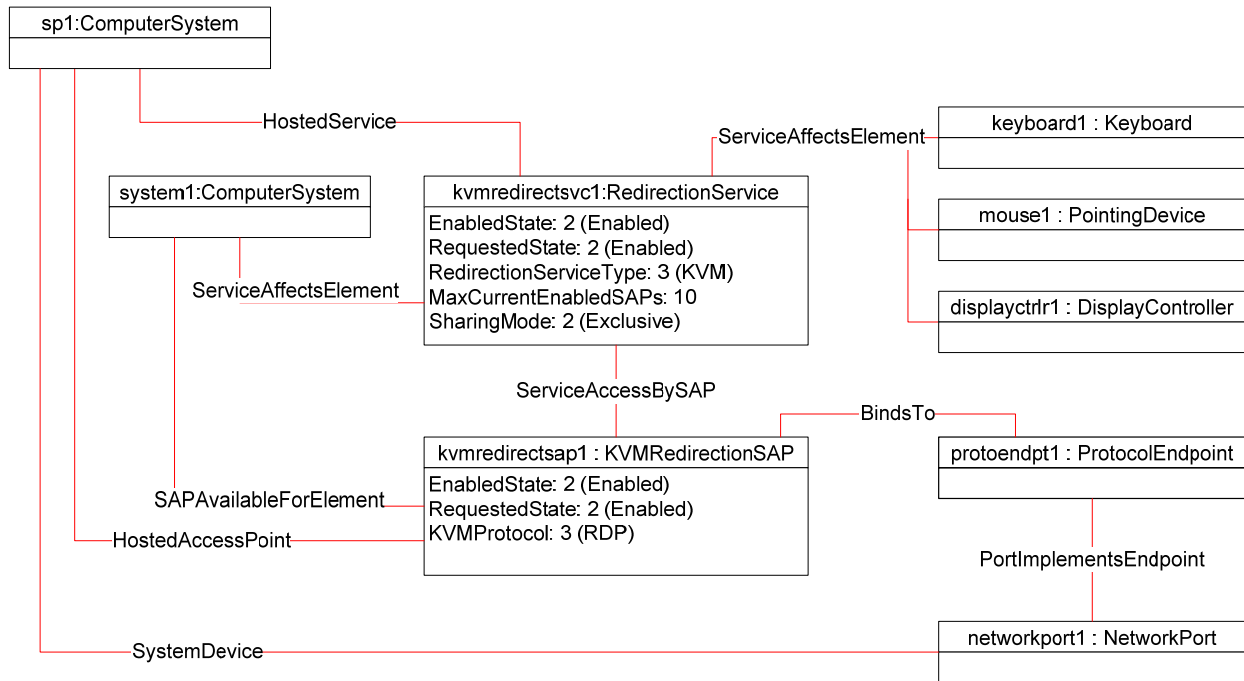
788 The service also affects *keyboard1*, *displayctrlr1* and *mouse1* as represented by the
 789 CIM_ServiceAffectsElement association between *keyboard1*, *displayctrlr1* and *mouse1* and
 790 *kvmredirectsvc1*. This signifies that *keyboard1*, *displayctrlr1* and *mouse1* are the Original Destination of a
 791 KVM console which can be redirected. *keyboard1*, *displayctrlr1* and *mouse1* are associated to *system1*
 792 through CIM_SystemDevice (not shown).

793 The KVM Redirection Session (*kvmredirectsap1*) is hosted on *sp1* as represented by the
 794 CIM_HostedAccessPoint association between *sp1* and *kvmredirectsap1*. The Session (*kvmredirectsap1*)

795 provides a SAP for *system1* as represented by the CIM_SAPAvailableForElement association between
 796 *system1* and *kvmredirectsap1*.

797 From *kvmredirectsap1*, the CIM_BindsTo association can be traversed to the CIM_ProtocolEndpoint
 798 (*protoendpt1*). From *protoendpt1*, the CIM_PortImplementsEndpoint association can be traversed to the
 799 network port (*networkport1*), a device on *sp1*.

800 In the figure, the KVM Redirection specified by *kvmredirectsvc1* and *kvmredirectsap1* is active, because
 801 the state of the *kvmredirectsvc1* is 2 (Enabled) and the state of the *kvmredirectsap1* is 2 (Enabled).



802

803 **Figure 4 – Monolithic System with Service Processor Object Diagram**

804 **9.4 Object Diagram for a Modular System**

805 The Figure 5 shows a modular system which can redirect the KVM devices on a blade to the network port
 806 of the chassis management module (CMM) or the network port of the blade. The chassis management
 807 module is represented with an instance of CIM_ComputerSystem, *chassismgr1*. The blade is represented
 808 with an instance of CIM_ComputerSystem, *blade1*.

809 The KVM Redirection Service (*kvmredirectsvc1*) is hosted on *chassismgr1* as represented by the
 810 CIM_HostedService association between *chassismgr1* and *kvmredirectsvc1*. The service affects *blade1*
 811 as represented by the CIM_ServiceAffectsElement association between *blade1* and *kvmredirectsvc1*.
 812 This signifies that *blade1* is the source of the KVM console which can be redirected.

813 The service also affects *keyboard1*, *displayctrlr1* and *mouse1* as represented by the
 814 CIM_ServiceAffectsElement association between *keyboard1*, *displayctrlr1* and *mouse1* and
 815 *kvmredirectsvc1*. This signifies that *keyboard1*, *displayctrlr1* and *mouse1* are the Original Destination of a
 816 KVM console which can be redirected. The instance *keyboard1*, *displayctrlr1* and *mouse1* are associated
 817 to *blade1* via an instance of CIM_SystemDevice.

818 There are two KVM Redirection Sessions, *kvmredirectsap1* and *kvmredirectsap2*. Each is associated to
 819 the Service via an instance of the CIM_ServiceAccessBySAP associations.

820 One KVM Redirection Session (*kvmredirectsap1*) is hosted on *blade1* as represented by the
 821 CIM_HostedAccessPoint association between *blade1* and *kvmredirectsap1*. This shows that the
 822 resources of *blade1* are used to host the redirection session. The Session (*kvmredirectsap1*) provides a
 823 SAP for *blade1* as represented by the CIM_SAPAvailableForElement association between *blade1* and
 824 *kvmredirectsap1*.

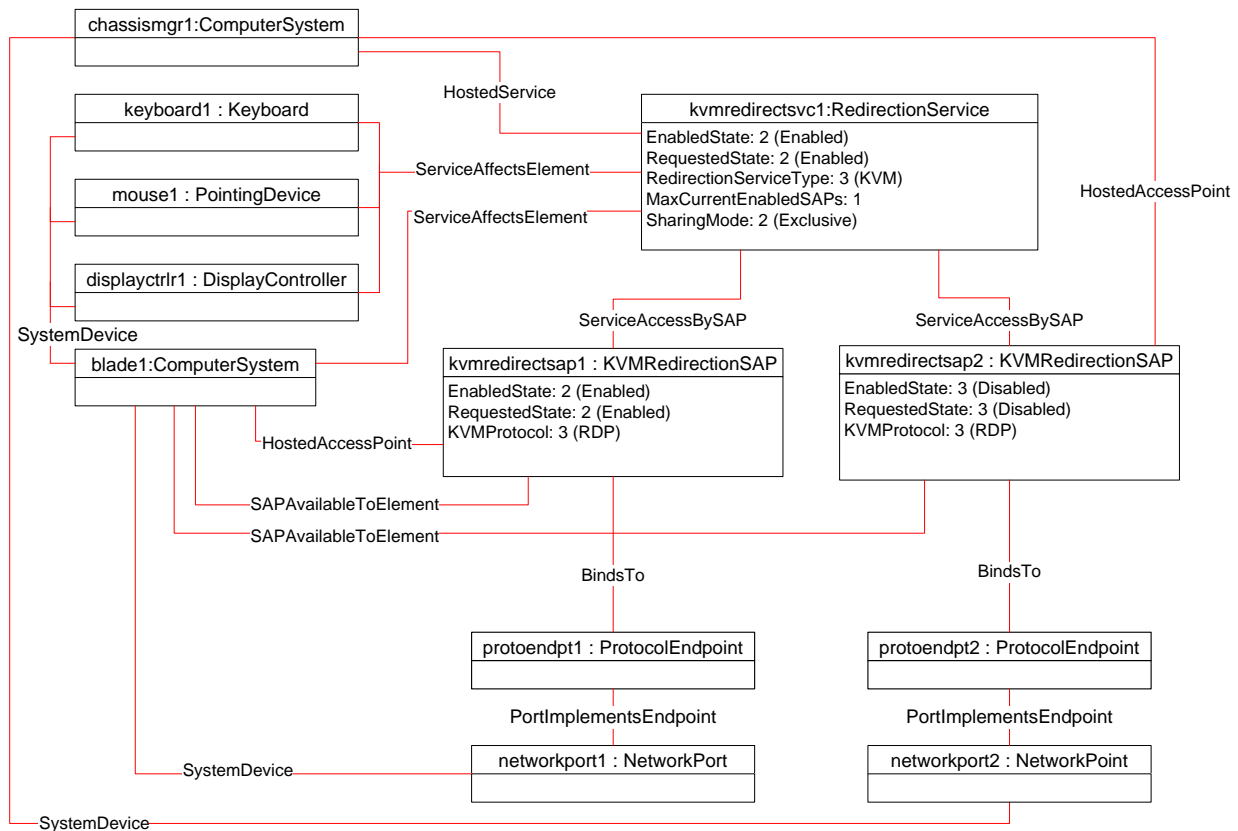
825 From *kvmredirectsap1*, the CIM_BindsTo association can be traversed to the CIM_ProtocolEndpoint
 826 (*protoendpt1*). From *protoendpt1*, the CIM_PortImplementsEndpoint association can be traversed to the
 827 network port (*networkport1*), a device on *blade1*.

828 The other KVM Redirection Session (*kvmredirectsap2*) is hosted on *chassismgr1* as represented by the
 829 CIM_HostedAccessPoint association between *chassismgr1* and *kvmredirectsap2*. This shows that the
 830 resources of *chassismgr1* are used to host the redirection session. The Session (*kvmredirectsap2*) also
 831 provides a SAP for *blade1* as represented by the CIM_SAPAvailableForElement association between
 832 *blade1* and *kvmredirectsap2*.

833 From *kvmredirectsap2*, the CIM_BindsTo association can be traversed to the CIM_ProtocolEndpoint
 834 (*protoendpt2*). From *protoendpt2*, the CIM_PortImplementsEndpoint association can be traversed to the
 835 network port (*networkport2*), a device on *chassismgr1*.

836 Note that both *kvmredirectsap1* and *kvmredirectsap2* are associated to *blade1* with the
 837 CIM_SAPAvailableForElement, because *blade1* is the source of the KVM Redirection regardless of
 838 whether the SAP is hosted on the *blade1* or *chassismgr1*.

839 In Figure 5, the KVM Redirection specified by *kvmredirectsvc1* and *kvmredirectsap1* is active, because
 840 the state of *kvmredirectsvc1* is 2 (Enabled) and the state of *kvmredirectsap1* is 2 (Enabled). The state of
 841 *kvmredirectsap2* is 3 (Disabled), which means that the session specified by *kvmredirectsvc1* and
 842 *kvmredirectsap2* is not permitted to be made active.



843

844

Figure 5 – Modular System Object Diagram

845 **9.5 Determine Whether a System Has KVM Consoles That Can Be Redirected.**

846 A client can determine whether a computer system of interest has KVM consoles that can be redirected
847 as follows:

- 848 1) Start at the instance of CIM_ComputerSystem which represents the computer system whose
849 KVM consoles are of interest.
- 850 2) Enumerate the instances of the CIM_RedirectionService which are associated to the
851 CIM_ComputerSystem via an instance of the CIM_ServiceAffectsElement association.
- 852 3) If the enumeration is zero, the computer system has no KVM console that can be redirected.
- 853 4) Otherwise, the computer system has at least one KVM console that can be redirected. Each
854 instance of CIM_RedirectionService so found represents a Service on the computer system.

855 **9.6 Determine Whether a Keyboard, Display Controller or Pointing Device Can 856 Be Redirected**

857 A client can determine whether a keyboard, display controller or pointing device of interest can be
858 redirected as follows:

- 859 1) Start at the instance of CIM_Keyboard, CIM_DisplayController and/or CIM_PointingDevice
860 which represents the device(s) of interest.
- 861 2) Enumerate the instances of the CIM_RedirectionService which are associated to the
862 CIM_Keyboard, CIM_DisplayController and/or CIM_PointingDevice via an instance of the
863 CIM_ServiceAffectsElement association.
- 864 3) If the enumeration is zero, the KVM console cannot be redirected.
- 865 4) Otherwise, the keyboard, display controller or pointing device of interest is the Original
866 Destination for at least one KVM Redirection. Each session can be found by using the
867 CIM_RedirectionService, so found, as the Service.
- 868 5) It is advisable to enumerate the instances of any other CIM_LogicalDevice with which the
869 CIM_RedirectionService is associated, because this service may affect more than one device.
870 To do that, enumerate the instances of CIM_LogicalDevice, such as CIM_Keyboard,
871 CIM_DisplayController and/or CIM_PointingDevice which are associated to the instance of
872 CIM_RedirectionService via an instance of the CIM_ServiceAffectsElement association (other
873 than the one found in step 2).

874 **9.7 Find the KVM Redirection Services for a Computer System**

875 A client can determine the KVM Redirection Service on a computer system of interest as follows:

- 876 1) Start at the instance of CIM_ComputerSystem which represents the computer system of
877 interest.
- 878 2) Enumerate the instances of the CIM_RedirectionService which are associated to the
879 CIM_ComputerSystem via an instance of the CIM_ServiceAffectsElement association and
880 which have a CIMRedirectionService.RedirectionServiceType set to 3 (KVM).
- 881 3) Each instance of CIM_RedirectionService, so found, is a KVM Redirection Service for the
882 computer system of interest.

883 **9.8 Find the Original Destinations on a Computer System**

884 A client can determine the sources of KVM Console Flows (or Original Destinations) on a computer
885 system of interest as follows:

- 886 1) Start at the instance of CIM_ComputerSystem which represents the computer system of
887 interest.

- 888 2) Determine the KVM Redirection Services for the computer system using the use case in 9.7.
- 889 3) From each instance of CIM_RedirectionService so found, determine if there is an instance of
890 CIM_LogicalDevice which is associated to the instance of CIM_RedirectionService via an
891 instance of the CIM_ServiceAffectsElement association.
- 892 4) If an instance of CIM_LogicalDevice does not exist, there may be no further information to
893 determine the Original Destination of the KVM Redirection Service.
- 894 5) Each instance of CIM_LogicalDevice, so found, is a Original Destination for the computer
895 system of interest.

896 **9.9 Find the KVM Redirection Sessions for a Service**

897 A client can determine the KVM Redirection Sessions for a Service of interest as follows:

- 898 1) Start at the instance of CIM_RedirectionService of interest. (The instance could be found using
899 the use case in 9.6).
- 900 2) Enumerate the instances of CIM_KVMRedirectionSAP which are associated via an instance of
901 CIM_ServiceAccessBySAP.
- 902 3) Each instance of CIM_KVMRedirectionSAP, so found, is a KVM Redirection Session for the
903 computer system of interest.

904 **9.10 Find the Destinations for the Redirected KVM Console Flow for a Service**

905 A client can determine the KVM Redirection destinations redirected from a Service of interest as follows:

- 906 1) Start at the instance of CIM_RedirectionService of interest. (The instance could be found using
907 the use case in 9.6.)
- 908 2) Determine the KVM Redirection Sessions using the use case in 9.9.
- 909 3) From each instance of CIM_KVMRedirectionSAP, determine if there is an instance of a
910 subclass of CIM_ProtocolEndpoint which is associated to the instance of
911 CIM_KVMRedirectionSAP via an instance of the CIM_BindsTo association.
- 912 4) If an instance of CIM_ProtocolEndpoint does not exist, there may be no further information to
913 determine the Destination of the KVM RedirectionSession.
- 914 5) Otherwise, for each instance of CIM_ProtocolEndpoint, so found, traverse the
915 CIM_PortImplementsEndpoint association to the instance of CIM_NetworkPort.
- 916 6) Each instance of CIM_NetworkPort, so found, is a destination of the redirected KVM Console
917 Flow for the Service.

918 **9.11 Find a KVM Redirection**

919 Finding a KVM Redirection involves finding the KVM Redirection Service and the KVM Redirection
920 Session.

921 A client can find a KVM Redirection as follows:

- 922 1) Use the steps described in 9.7 to find the instance of CIM_RedirectionService of interest.
- 923 2) Use the steps described in 9.9 to find the instance of CIM_KVMRedirectionSAP of interest.
- 924 3) The instance of CIM_RedirectionService and instance of CIM_KVMRedirectionSAP, so found,
925 are components the KVM Redirection of interest.

926 9.12 Determine the Type of KVM Redirection State Management Supported

927 A client can determine whether a KVM Redirection is managed via the state of Session only or via the
928 states of both the Service and Session as follows:

- 929 1) Start at the instance of CIM_RedirectionService which is a part of the KVM Redirection of
930 interest.
- 931 2) Determine if an instance of CIM_ElementCapabilities exists which associates the instance of
932 CIM_RedirectionService to an instance of CIM_RedirectionServiceCapabilities.
- 933 3) If the instance does not exist, the KVM Redirection Session is managed via the state of the
934 Session only.
- 935 4) Otherwise, on the instance of CIM_RedirectionServiceCapabilities so found, query the value of
936 the RequestedStateSupported property array.
- 937 5) If the RequestedStatesSupported property array contains no values, the KVM Redirection is
938 managed via the state of the Session only.
- 939 6) Otherwise, the KVM Redirection can be managed via the state of both Service and Session.

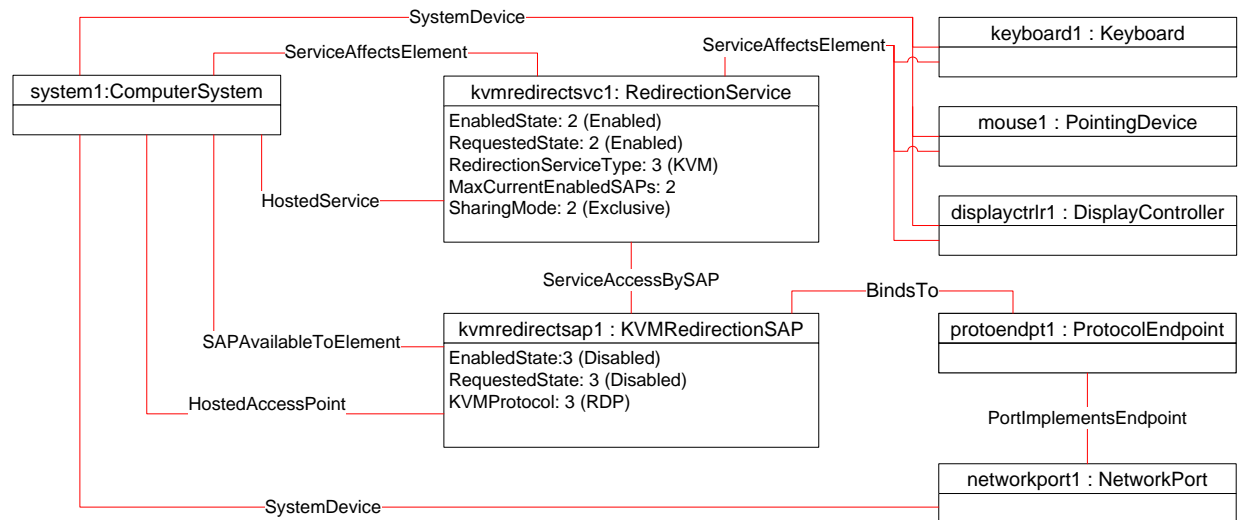
940 9.13 Activate a KVM Redirection — Session Only

941 When the KVM Redirection is managed via the state of the Session only, a client can start a KVM
942 Redirection as follows:

- 943 1) Start at the instance of the CIM_KVMRedirectionSAP which is a component of the KVM
944 Redirection of interest.
- 945 2) Invoke the RequestStateChange() method with the RequestedState parameter set to 2
946 (Enabled).
- 947 3) Verify that the CIM_KVMRedirectionSAP.EnabledState property is set to a value of 6 (Enabled
948 but Offline) or 2 (Enabled).
- 949 4) The KVM Redirection is now available, and may be active.

950 Figure 6 shows an initial state of the KVM Redirection as inactive, because the state of *kvmredirectsvc1* is
951 2 (Enabled), but the state of *kvmredirectsap1* is 3 (Disabled). The steps described above will change the
952 state of the *kvmredirectsap1* to 6 (Enabled but Offline), thereby activating the KVM Redirection specified
953 by *kvmredirectsvc1* and *kvmredirectsap1*. When the implementation detects that KVM Redirection Flow is
954 active, the diagram of the active KVM Redirection will look like Figure 3.

955



956

957

Figure 6 – An Initial State of a Session Managed via the Session State Only

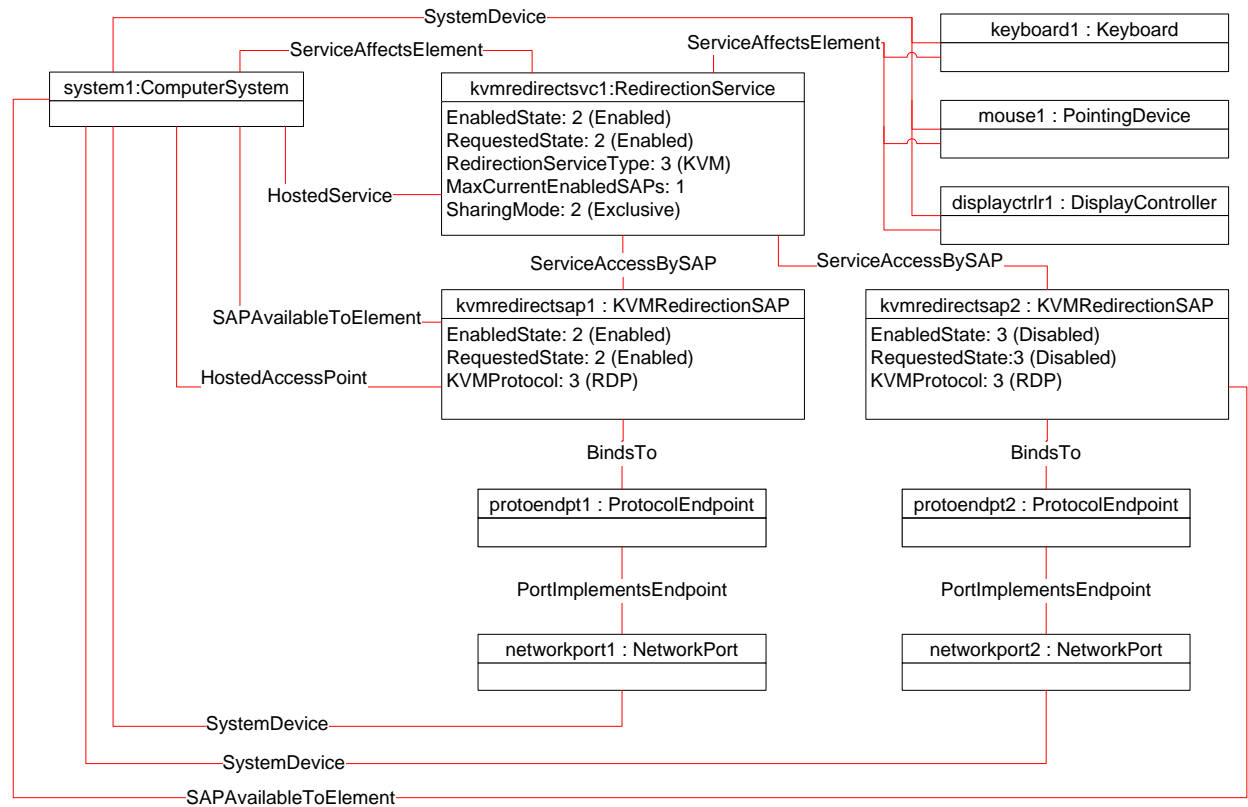
958 9.14 Activate a Singular KVM Redirection

959 When the KVM Redirection is a Singular KVM Redirection, a client can atomically activate a KVM
 960 Redirection and deactivate a previously activated KVM Redirection (see 8.2.2).

961 This above behavior is accomplished as follows:

- 962 1) Start at the instance of the CIM_KVMRedirectionSAP which is a component of the KVM
 963 Redirection of interest.
- 964 2) Invoke the RequestStateChange() method with the RequestedState parameter set to 2
 965 (Enabled).
- 966 3) Verify that the CIM_KVMRedirectionSAP.EnabledState property is set to a value of 6 (Enabled
 967 but Offline) or 2 (Enabled).
- 968 4) The KVM Redirection is now available and may be active and any previously active session is
 969 now inactive.

970 Figure 7 shows the object diagram of the initial state of a Singular KVM Redirection. Note that the
 971 MaxCurrentEnabledSAPs property of *kvmredirectsvc1* is 1, by definition. The state of the Singular KVM
 972 Redirection, specified by *kvmredirectsvc1* and *kvmredirectsap1*, is active, because the state of
 973 *kvmredirectsvc1* is 2 (Enabled) and the state of *kvmredirectsap1* is 2 (Enabled).



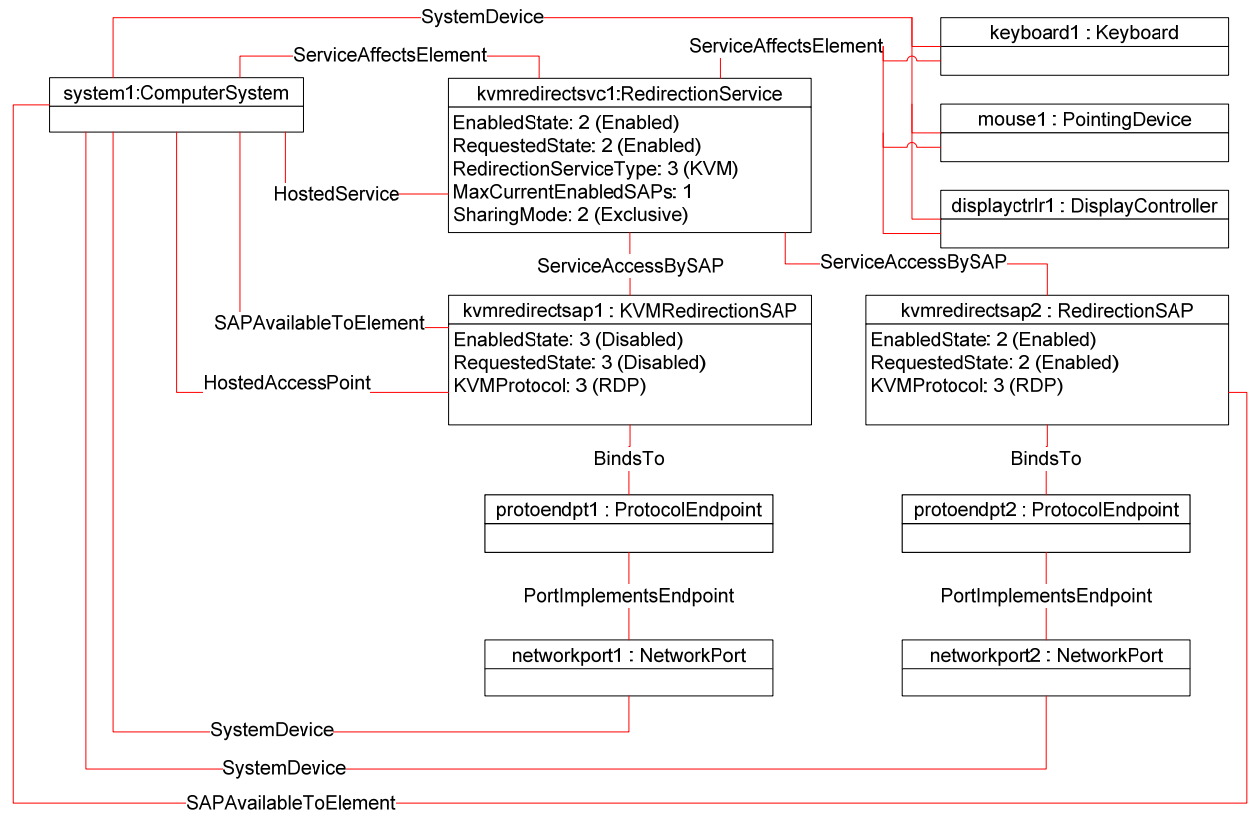
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Figure 7 – The Initial State of a Singular KVM Redirection

976 If the CIM_KVMRedirectionSAP described in step one above is *kvmredirectsap2*, then the steps
 977 described above will change the state of the *kvmredirectsap1* to 3 (Disabled) and the state of the
 978 *kvmredirectsap2* to 6 (Enabled but Offline) or 2 (Enabled) because MaxCurrentEnabledSAPs is set to 1.
 979 This will result in the KVM Redirection Session specified by *kvmredirectsvc1* and *kvmredirectsap2* being
 980 available or active, while the session specified by *kvmredirectsvc1* and *kvmredirectsap1* is inactive.

981 Figure 8 is an object diagram of the final state of the Singular KVM Redirection, when the call to the
 982 RequestedStateChange() method completes successfully and the implementation detects that the KVM
 983 Redirection Flow is active..



984

985

Figure 8 – The Final State of a Singular KVM Redirection

986

9.15 Stop All KVM Redirection Associated with the Source — Session Only

987

In the following use case, it is assumed that the client knows the instance of CIM_RedirectionService which specify the KVM Redirection Source of interest.

988

989

When the KVM Redirection is managed via the state of the Session only, a client can stop all KVM Redirection as follows:

990

991

- 1) Start at the instance of the CIM_RedirectionService which represents the KVM Redirection Service of interest.

992

993

- 2) Enumerate the instances of CIM_KVMRedirectionSAP which are associated to the instance of CIM_RedirectionService via an instance of CIM_ServiceAccessBySAP.

994

995

- 3) For each instance of CIM_KVMRedirectionSAP so found, query the value of the EnabledState property.

996

997

- 4) If the state of the CIM_KVMRedirectionSAP is not 3 (Disabled), invoke the RequestStateChange() method with the RequestedState parameter set to 3 (Disabled).

998

999

- 5) Verify that the CIM_KVMRedirectionSAP.EnabledState property is set to a value of 3 (Disabled).

1000

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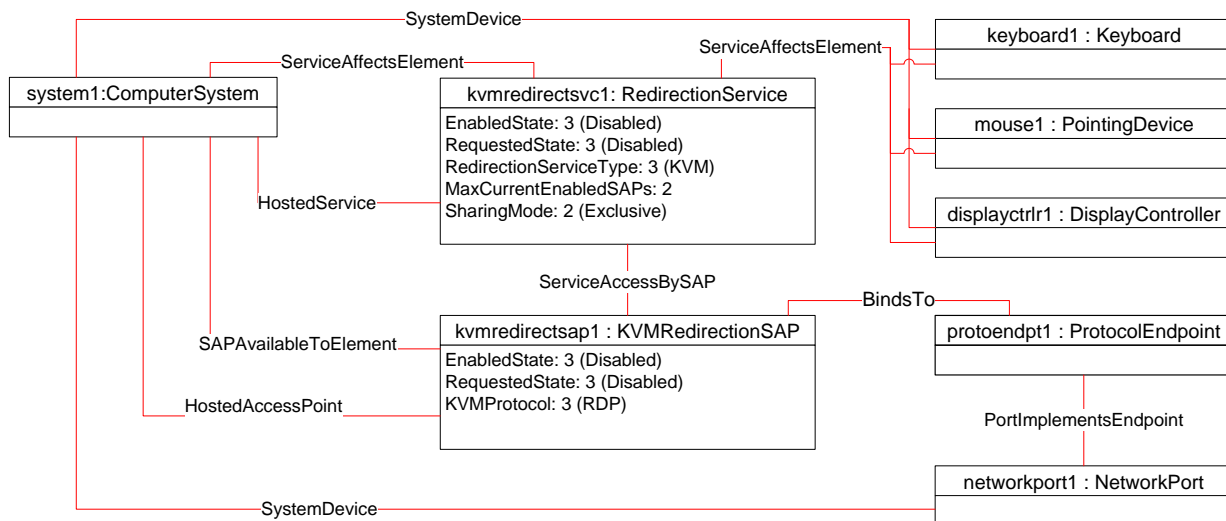
- 6) Each KVM Redirection redirected from the Service is now inactive.

1002 **9.16 Activate a KVM Redirection — Service and Session State Management**

1003 When the KVM Redirection is managed via the states of both the Service and Session, a client can start a
 1004 KVM Redirection as follows:

- 1005 1) Start at the instance of CIM_RedirectionService of interest.
- 1006 2) Invoke the CIM_RedirectionService.RequestStateChange() method with the RequestedState
 1007 parameter set to 2 (Enabled).
- 1008 3) Verify that the CIM_RedirectionService.EnabledState property is set to a value of 2 (Enabled).
- 1009 4) Invoke the CIM_KVMRedirectionSAP.RequestStateChange() method with the RequestedState
 1010 parameter set to 2 (Enabled).
- 1011 5) Verify that the CIM_KVMRedirectionSAP.EnabledState property is set to a value of 6 (Enabled
 1012 but Offline) or 2 (Enabled).
- 1013 6) The KVM Redirection is now available or, if KVM Redirection Flow has started, active.

1014 Figure 9 shows an initial state of the KVM Redirection as inactive, because the state of *kvmredirectsvc1* is
 1015 3 (Disabled), and the state of *kvmredirectsap1* is 3 (Disabled) The steps described above will change the
 1016 state of *kvmredirectsap1* to 6 (Enabled but Offline) and the state of *kvmredirectsvc1* to 2 (Enabled),
 1017 thereby enabling the KVM Redirection specified by *kvmredirectsvc1* and *kvmredirectsap1* for use. When
 1018 the implementation detects that the KVM Redirection Flow has started, the diagram of the active KVM
 1019 Redirection will look like Figure 3.



1020
 1021 **Figure 9 – An Initial State of a Session Managed via the Service and Session State**

1022 **9.17 Stop All KVM Redirection — Service and Session State Management**

1023 When the KVM Redirection is managed via the states of both the Service and Session, a client can stop
 1024 all KVM Redirections associated with the Service as follows:

- 1025 1) Start at the instance of the CIM_RedirectionService which represents the KVM Redirection
 1026 Service of interest.
- 1027 2) Change the state of the CIM_RedirectionService by invoking the RequestStateChange()
 1028 method with the RequestedState parameter set to 3 (Disabled).
- 1029 3) All KVM Redirections with the CIM_RedirectionService as the Service is now inactive.

1030 9.18 Find the Number of Active KVM Redirection Access Points

1031 A client can find the number of active KVM Redirections for a Service of interest as follows:

- 1032 1) Start at the instance of CIM_RedirectionService of interest.
- 1033 2) Query the value of the EnabledState property.
- 1034 3) If the EnabledState property is 3 (Disabled), then the number of active KVM Redirection is zero.
- 1035 4) If the EnabledState property is 2 (Enabled), then find all instances of CIM_KVMRedirectionSAP
- 1036 associated via an instance of CIM_ServiceAccessBySAP.
- 1037 5) For each CIM_KVMRedirectionSAP query the value of the EnabledState property.
- 1038 6) Count all the CIM_KVMRedirectionSAP.EnabledState properties whose value is 2 (Enabled).

1039 9.19 Determine Whether CIM_RedirectionService.ElementName Can Be Modified

1040 A client can determine whether the ElementName can be modified as follows:

- 1041 1) Start at the instance of CIM_RedirectionService.
- 1042 2) Get the CIM_RedirectionServiceCapabilities instance associated by traversing the
- 1043 CIM_ElementCapabilities association.
- 1044 3) Query the value of the ElementNameEditSupported property of the instance.
- 1045 4) If the value is TRUE, the CIM_RedirectionService.ElementName property can be modified by a
- 1046 client.

1047 If there is not an instance of CIM_RedirectionServiceCapabilities associated with the
 1048 CIM_RedirectionService instance, modifying the CIM_RedirectionService.ElementName property is not
 1049 supported.

1050 10 CIM Elements

1051 This clause lists the required properties and method for each class required for this profile. Additional
 1052 requirements on these elements may have been imposed in clauses 7 (“Implementation Requirements”)
 1053 and 8 (“Methods”).

1054 Table 16 lists the CIM Elements which are required for this profile. The subsequent subclauses contain
 1055 those CIM Elements where additional normative statements can be made.

1056 **Table 16 – CIM Elements: KVM Redirection Profile**

Element Name	Requirement	Description
CIM_RegisteredProfile	Mandatory	See 10.1.
CIM_BindsTo	Optional	See 10.2.
CIM_ElementCapabilities	Conditional	Referencing CIM_RedirectionService. See 10.3.
CIM_ElementCapabilities	Conditional	Referencing CIM_KVMRedirectionSAP. See 10.4.
CIM_RedirectionServiceCapabilities	Optional	Associated to CIM_RedirectionService. See 10.5.
CIM_EnabledLogicalElementCapabilities	Optional	Associated to CIM_KVMRedirectionSAP. See 10.6.

Element Name	Requirement	Description
CIM_HostedAccessPoint	Mandatory	See 10.7.
CIM_HostedService	Mandatory	See 10.8.
CIM_SAPAvailableForElement	Mandatory	See 10.9.
CIM_ServiceAccessBySAP	Mandatory	See 10.10.
CIM_ServiceAffectsElement	Mandatory	Referencing CIM_ComputerSystem. See 10.11.
CIM_ServiceAffectsElement	Optional	Referencing CIM_LogicalDevice. See 10.12.
CIM_RedirectionService	Mandatory	See 10.13.
CIM_KVMRedirectionSAP	Mandatory	See 10.14.

1057 **10.1 CIM_RegisteredProfile**

1058 CIM_RegisteredProfile identifies the *KVM Redirection Profile* in order for a client to determine whether an
 1059 instance of CIM_ComputerSystem is conformant with this profile. The CIM_RegisteredProfile class is
 1060 defined by the [Profile Registration Profile](#). With the exception of the mandatory values specified for the
 1061 properties in Table 17, the behavior of the RegisteredProfile instance is per the [Profile Registration](#)
 1062 [Profile](#).

1063 **Table 17 – Class: CIM_RegisteredProfile**

Properties	Requirement	Notes
RegisteredName	Mandatory	This property shall have a value of "KVM Redirection".
RegisteredVersion	Mandatory	This property shall have a value of "1.0.1".
RegisteredOrganization	Mandatory	This property shall have a value of 2 (DMTF).

1064 **10.2 CIM_BindsTo**

1065 The CIM_BindsTo association is used to relate the CIM_KVMRedirectionSAP to the
 1066 CIM_ProtocolEndpoint which is the destination of the redirected KVM console.

1067 Table 18 contains the requirements for elements of this class.

1068 **Table 18 – Class: CIM_BindsTo**

Properties	Requirement	Notes
Antecedent	Mandatory	This shall be a reference to an instance of the CIM_ProtocolEndpoint class. See 7.4.1. Cardinality is "0..1".
Dependent	Mandatory	This shall be a reference to an instance of the CIM_KVMRedirectionSAP. See 7.4.1. Cardinality is "1..*".

1069 **10.3 CIM_ElementCapabilities Relating CIM_RedirectionService to**
 1070 **CIM_RedirectionServiceCapabilities**

1071 The CIM_ElementCapabilities association is used to relate an instance of
 1072 CIM_RedirectionServiceCapabilities with the instance of CIM_RedirectionService.

1073 Table 19 contains the requirements for elements of this class.

1074 **Table 19 – Class: CIM_ElementCapabilities Referencing CIM_RedirectionService**

Properties	Requirement	Description
ManagedElement	Mandatory	This shall be a reference to an instance of CIM_RedirectionService. See 7.6.1.1 and 7.6.2.1. Cardinality is "1..*".
Capabilities	Mandatory	This shall be a reference to an instance of CIM_RedirectionServiceCapabilities. See 7.6.1.1 and 7.6.2.1. Cardinality is "0..1".

1075 **10.4 CIM_ElementCapabilities Relating CIM_KVMRedirectionSAP to**
 1076 **CIM_EnabledLogicalElementCapabilities**

1077 The CIM_ElementCapabilities association is used to relate an instance of
 1078 CIM_EnabledLogicalElementCapabilities with the instance of CIM_KVMRedirectionSAP.

1079 Table 20 contains the requirements for elements of this class.

1080 **Table 20 – Class: CIM_ElementCapabilities Referencing CIM_KVMRedirecitonSAP**

Properties	Requirement	Description
ManagedElement	Mandatory	This shall be a reference to an instance of CIM_KVMRedirectionSAP. See 7.7.1.1 and 7.7.2.1. Cardinality is "1..*".
Capabilities	Mandatory	This shall be a reference to an instance of CIM_EnabledLogicalElementCapabilities. See 7.7.1.1 and 7.7.2.1. Cardinality is "0..1".

1081 **10.5 CIM_RedirectionServiceCapabilities Associated to CIM_RedirectionService**

1082 CIM_RedirectionServiceCapabilities indicates support for managing the KVM Redirection Service.

1083 Table 21 contains the requirements for elements of this class.

1084 **Table 21 – Class: CIM_RedirectionServiceCapabilities Associated to CIM_RedirectionService**

Elements	Requirement	Notes
InstanceID	Mandatory	Key
RequestedStatesSupported	Mandatory	See 7.6.1.1 and 7.6.2.1.
ElementNameEditSupported	Mandatory	See 7.3.6.1 and 7.3.6.2.
MaxElementNameLen	Conditional	See 7.3.6.1 and 7.3.6.2.
SharingModeSupported	Mandatory	See 7.3.3.

1085 **10.6 CIM_EnabledLogicalElementCapabilities Associated to**
 1086 **CIM_KVMRedirectionSAP**

1087 CIM_EnabledLogicalElementCapabilities indicates support for managing the KVM Redirection Session.

1088 Table 22 contains the requirements for elements of this class.

1089 **Table 22 – Class: CIM_EnabledLogicalElementCapabilities Associated to**
 1090 **CIM_KVMRedirectionSAP**

Elements	Requirement	Notes
InstanceID	Mandatory	Key
RequestedStatesSupported	Mandatory	See 7.7.1.1 and 7.7.2.1.
ElementNameEditSupported	Mandatory	See 7.4.4.1 and 7.4.4.2.
MaxElementNameLen	Conditional	See 7.4.4.1 and 7.4.4.2.

1091 **10.7 CIM_HostedAccessPoint**

1092 The CIM_HostedAccessPoint association is used to relate the CIM_KVMRedirectionSAP to the
 1093 CIM_ComputerSystem to which the KVM console is redirected.

1094 Table 23 contains the requirements for elements of this class.

1095 **Table 23 – Class: CIM_HostedAccessPoint**

Properties	Requirement	Notes
Antecedent	Mandatory	This shall be a reference to an instance of the CIM_ComputerSystem class. See 7.4. Cardinality is "1".
Dependent	Mandatory	This shall be a reference to an instance of the CIM_KVMRedirectionSAP. See 7.4. Cardinality is "**".

1096 **10.8 CIM_HostedService**

1097 The CIM_HostedService association is used to relate the CIM_RedirectionService to the
 1098 CIM_ComputerSystem on which it is hosted.

1099 Table 24 contains the requirements for elements of this class.

1100 **Table 24 – Class: CIM_HostedService**

Properties	Requirement	Notes
Antecedent	Mandatory	This shall be a reference to an instance of the CIM_ComputerSystem class. See 7.2. Cardinality is "1".
Dependent	Mandatory	This shall be a reference to an instance of the CIM_RedirectionService. See 7.2. Cardinality is "**".

1101 10.9 CIM_SAPAvailableForElement

1102 The CIM_SAPAvailableForElement association is used to relate the instance of CIM_ComputerSystem to
 1103 the instances of CIM_KVMRedirectionSAP which are available as access points for the redirected KVM
 1104 console.

1105 Table 25 contains the requirements for elements of this class.

1106 **Table 25 – Class: CIM_SAPAvailableForElement**

Properties	Requirement	Notes
AvailableSAP	Mandatory	This shall be a reference to an instance of the CIM_KVMRedirectionSAP class. See 7.4. Cardinality is "*".
ManagedElement	Mandatory	This shall be a reference to an instance of the CIM_ComputerSystem. See 7.4. Cardinality is "1".

1107 10.10 CIM_ServiceAccessBySAP

1108 The CIM_ServiceAccessBySAP association is used to relate the instance of CIM_RedirectionService to
 1109 the instances of CIM_KVMRedirectionSAP which are enabled by the service.

1110 Table 26 contains the requirements for elements of this class.

1111 **Table 26 – Class: CIM_ServiceAccessBySAP**

Properties	Requirement	Notes
Antecedent	Mandatory	This shall be a reference to an instance of the CIM_RedirectionService class. See 7.17.1. Cardinality is "1".
Dependent	Mandatory	This shall be a reference to an instance of the CIM_KVMRedirectionSAP. See 7.17.1. Cardinality is "1..*".

1112 10.11 CIM_ServiceAffectsElement Relating CIM_RedirectionService to 1113 CIM_ComputerSystem

1114 The CIM_ServiceAffectsElement association is used to relate the instance of CIM_RedirectionService to
 1115 the instance of CIM_ComputerSystem which represent the source of the KVM console flow.

1116 Table 27 contains the requirements for elements of this class.

1117 **Table 27 – Class: CIM_ServiceAffectsElement Referencing CIM_ComputerSystem**

Properties	Requirement	Notes
AffectingElement	Mandatory	This shall be a reference to an instance of the CIM_RedirectionService class. See 7.1. Cardinality is "*".
AffectedElement	Mandatory	This shall be a reference to an instance of the CIM_ComputerSystem. See 7.1. Cardinality is "1".

1118 **10.12 CIM_ServiceAffectsElement Relating CIM_RedirectionService to a Concrete**
 1119 **Subclass of CIM_LogicalDevice**

1120 The CIM_ServiceAffectsElement association is used to relate the instance of CIM_RedirectionService to
 1121 the instance of a concrete class of CIM_LogicalDevice which represent the source of the KVM console
 1122 flow.

1123 Table 28 contains the requirements for elements of this class.

1124 **Table 28 – Class: CIM_ServiceAffectsElement Referencing CIM_LogicalDevice**

Properties	Requirement	Notes
AffectingElement	Mandatory	This shall be a reference to an instance of the CIM_RedirectionService class. See 7.3.2. Cardinality is "1".
AffectedElement	Mandatory	This shall be a reference to an instance of CIM_LogicalDevice. See 7.3.2. Cardinality is "0..1".

1125 **10.13 CIM_RedirectionService**

1126 The CIM_RedirectionService class represents the ability to manage the KVM Redirection capabilities of a
 1127 computer system.

1128 Table 29 contains the requirements for elements of this class.

1129 **Table 29 – Class: CIM_RedirectionService**

Properties	Requirement	Description
SystemCreationClassName	Mandatory	Key
SystemName	Mandatory	Key
CreationClassName	Mandatory	Key
Name	Mandatory	Key
ElementName	Mandatory	See 7.3.6.
MaxCurrentEnabledSAPs	Mandatory	See 7.3.5.
EnabledState	Mandatory	See 7.6.
RequestedState	Mandatory	See 7.6.
RedirectionServiceType	Mandatory	See 7.2.
SharingMode	Mandatory	See 7.3.3.
RequestStateChange()	Mandatory	See 8.1.

1130 **10.14 CIM_KVMRedirectionSAP**

1131 The CIM_KVMRedirectionSAP class represents a KVM Redirection capability which is possible on a
 1132 computer system.

1133 Table 30 contains the requirements for elements of this class.

1134 **Table 30 – Class: CIM_KVMRedirectionSAP**

Properties	Requirement	Description
SystemCreationClassName	Mandatory	Key
SystemName	Mandatory	Key
Name	Mandatory	Key
CreationClassName	Mandatory	Key
ElementName	Mandatory	See 7.4.4.
EnabledState	Mandatory	See 7.7.1.3.
RequestedState	Mandatory	See 7.7.1.2.
KVMProtocol	Mandatory	See 7.4.2.
OtherKVMProtocol	Conditional	See 7.4.2.
RequestStateChange()	Mandatory	See 8.2.

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ANNEX A (informative)

Change Log

Version	Date	Description
1.0.0a	2007-08-06	Initial Preliminary Version
1.0.0	2009-06-16	DMTF Standard Release
1.0.1	2010-11-15	Initial Errata Revision for 1.0.1

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