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5 **Allocation Capabilities Profile**

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104

Foreword

105 The *Allocation Capabilities Profile* (DSP1043) was prepared by the System Virtualization, Partitioning,
106 and Clustering Work Group.

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

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141 settings model they introduced in the CIM model.

142

Introduction

143 The information in this specification should be sufficient for a provider or consumer of this data to identify
144 unambiguously the classes, properties, methods, and values that shall be instantiated and manipulated to
145 represent and manage the allocation capabilities of host systems and resource pools modeled using the
146 DMTF CIM core and extended model definitions.

147 The target audience for this specification is implementers who are writing CIM-based providers or
148 consumers of management interfaces representing the component described in this document.

149

Allocation Capabilities Profile

1 Scope

151 The *Allocation Capabilities Profile* extends the management capability of referencing profiles by adding
152 the ability to represent the default, supported and range of property values for resource allocation
153 requests for a given resource, and the mutability of properties in a Resource Allocation Setting Data
154 instance.

2 Normative References

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

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

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

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

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

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

3 Terms and Definitions

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

172 3.1

173 **can**

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

175 3.2

176 **cannot**

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

178 3.3

179 **conditional**

180 indicates requirements to be followed strictly in order to conform to the document if the specified
181 conditions are met

- 182 **3.4**
183 **mandatory**
184 indicates requirements to be followed strictly in order to conform to the document and from which no
185 deviation is permitted
- 186 **3.5**
187 **may**
188 indicates a course of action permissible within the limits of the document
- 189 **3.6**
190 **need not**
191 indicates a course of action permissible within the limits of the document
- 192 **3.7**
193 **optional**
194 indicates a course of action permissible within the limits of the document
- 195 **3.8**
196 **referencing profile**
197 indicates a profile that owns the definition of this class and can include a reference to this profile in its
198 "Referenced Profiles" table
- 199 **3.9**
200 **shall**
201 indicates requirements to be followed strictly in order to conform to the document and from which no
202 deviation is permitted
- 203 **3.10**
204 **shall not**
205 indicates requirements to be followed strictly in order to conform to the document and from which no
206 deviation is permitted
- 207 **3.11**
208 **should**
209 indicates that among several possibilities, one is recommended as particularly suitable, without
210 mentioning or excluding others, or that a certain course of action is preferred but not necessarily required
- 211 **3.12**
212 **should not**
213 indicates that a certain possibility or course of action is deprecated but not prohibited
- 214 **3.13**
215 **unspecified**
216 indicates that this profile does not define any constraints for the referenced CIM element or operation
- 217 **3.14**
218 **host system**
219 the scoping computer system in a virtualization environment that contains computing resources or system
220 devices that are capable of being virtualized
- 221 **3.15**
222 **virtual system**
223 a virtualized computer system that is composed of partitioned or virtualized computing resources and
224 system devices. Other common industry terms for such a system include virtual machine, hosted

225 computer, child partition, logical partition, domain, guest, and container. In some virtualization
226 environments, a Virtual system may act as the host system to other nested virtual systems, for example, a
227 logically partitioned system in which each partition runs an instance of a hypervisor.

228 **3.16**

229 **host resource**

230 system devices or computing resources contained by the host system that may be utilized — either
231 exclusively or shared — through the virtualization platform to provide resources to a virtual system

232 **3.17**

233 **virtual resource**

234 system devices or computing resources that are given or allocated by the virtualization platform to the
235 virtual system. Virtual resources are typically represented using the same CIM class as their respective
236 host resource.

237 **3.18**

238 **resource type**

239 a generic type that can be used to categorize classes of host resources or virtualized host resources, for
240 example, processor, memory, network adapter, and so on

241 **3.19**

242 **resource pool**

243 an abstract entity exposed by the Virtualization Platform for the purpose of allocation and assignment of
244 Virtual Resources to Virtual Systems. In the case where host resources of the same resource type can be
245 meaningfully separated, multiple mutually exclusive resource pools may exist.

246 **3.20**

247 **current setting data**

248 the virtual setting data associated with the current allocation state of a virtual resource or system.

249 **3.21**

250 **capability set**

251 a set of instances of class CIM_SettingData associated with the association
252 CIM_SettingsDefineCapabilities to a CIM_Capabilities instance, and the associated CIM_Capabilities
253 instance.

254 **4 Symbols and Abbreviated Terms**

255 **4.1**

256 **CIM**

257 Common Information Model

258 **4.2**

259 **CPU**

260 Central Processing Unit

261 **5 Synopsis**

262 **Profile Name:** Allocation Capabilities

263 **Version:** 1.0.0

264 **Organization:** DMTF

265 **CIM schema version:** 2.22

266 **Central Class:** CIM_AllocationCapabilities

267 **Scoping Class:** CIM_System

268

269 This abstract profile specification shall not be directly implemented; implementation shall be based on a
 270 profile specification for the capabilities of a resource pool or virtualization system for a specific class of
 271 resources, such as CPU and system memory. The scoping association paths between the central class
 272 and the scoping class shall be specified by the incorporating concrete profiles.

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

274

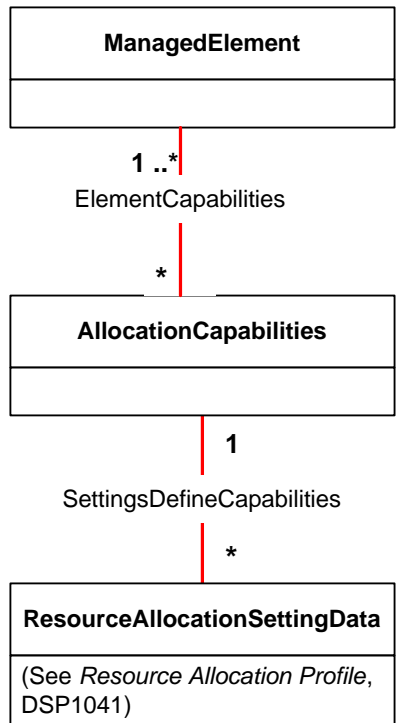
Table 1 – Related Profiles

Profile Name	Organization	Version	Requirement	Description
None.				

275 **6 Description**

276 The *Allocation Capabilities Profile* is an abstract profile that describes the use of the class
 277 CIM_AllocationCapabilities and the use of association CIM_SettingsDefineCapabilities to a set of
 278 CIM_ResourceAllocationSettingData instances to describe the default property values, supported
 279 property values, and range of property values for a resource allocation request.

280 Figure 1 represents the class schema for the *Allocation Capabilities Profile*. For simplicity, the prefix CIM_
 281 has been removed from the names of the classes.



282

283

Figure 1 – Allocation Capabilities Profile: Class Diagram

284 The CIM_ManagedElement class in Figure 1 represents a potential provider of resources such as a host
 285 system (CIM_ComputerSystem) or a resource pool (CIM_ResourcePool), or the CIM_ManagedElement
 286 class represents an instance of CIM_ResourceAllocationSettingData.

287 CIM_ElementCapabilities associates the CIM_AllocationCapabilities instance to a subclass of
 288 CIM_ManagedElement.

289 If a CIM_AllocationCapabilities instance associated using the CIM_ElementCapabilities association is
 290 used to define the allocation capabilities of the managed element, the set of
 291 CIM_ResourceAllocationSettingData instances together with properties of the CIM_AllocationCapabilities
 292 instance defines a supported set of default property values, supported property values, and range of
 293 supported property values required to form a valid allocation request for the resource type.

294 If a CIM_AllocationCapabilities instance is associated using the CIM_ElementCapabilities association to
 295 an instance of CIM_ResourceAllocationSettingData, the set of associated
 296 CIM_ResourceAllocationSettingData instances represents the supported changes or the range of valid
 297 changes for the properties in the CIM_ResourceAllocationSettingData instance.

298 CIM_SettingsDefineCapabilities associates instances of CIM_ResourceAllocationSettingData to a
 299 CIM_AllocationCapabilities instance and defines the type of capability the
 300 CIM_ResourceAllocationSettingData represents.

301 Note that the allocation capabilities do not reflect the current or dynamic state of any allocations. Rather
 302 they define valid allocation requests or valid settings modifications supported by the host system or
 303 resource pool without regard to the current availability of a host resource.

304 6.1 CIM_SettingsDefineCapabilities

305 The CIM_SettingsDefineCapabilities association indicates that the non-null, non-key set of properties of
 306 the component CIM_ResourceAllocationSettingData instance specifies some capabilities of the
 307 associated CIM_AllocationCapabilities instance. The interpretation of the set of properties in the
 308 associated CIM_ResourceAllocationSettingData is governed by the CIM_SettingsDefineCapabilities
 309 properties: PropertyPolicy, ValueRole, and ValueRange.

310 6.1.1 PropertyPolicy

311 The CIM Schema description of this property applies.

312 PropertyPolicy defines whether or not the non-null, non-key properties of the associated
 313 CIM_ResourceAllocationSettingData instance are treated independently or as a correlated set.

314 This profile assumes that the value of the PropertyPolicy property is 0 (“Independent”) if the ValueRange
 315 contains a value of 1 (“Minimums”), 2 (“Maximums”) or 3 (“Increments”). In these cases multiple instances
 316 of CIM_AllocationCapabilities with independent sets of capabilities are used to express correlated sets of
 317 capabilities.

318 PropertyPolicy can be set to 0 (“Independent”) or 1 (“Correlated”) if the property ValueRange is set to
 319 “Point” to express the independence or the dependence of the set of properties in the associated
 320 CIM_ResourceAllocationSettingData instance.

321 6.1.2 ValueRole

322 The CIM Schema description of this property applies.

323 The possible values for the ValueRole property are as follows:

- 324 • 0 (“Default”) indicates that property values of the component
 325 CIM_ResourceAllocationSettingData instance are the default values that are

- 326 used if a new CIM_ResourceAllocationSettingData instance is created for
327 elements whose capabilities are defined by the associated
328 CIM_AllocationCapabilities instance.
- 329 • 4 (“Supported”) indicates that the component
330 CIM_ResourceAllocationSettingData instance represents a set of supported
331 property values or the increments within a supported range of values.

332 6.1.3 ValueRange

333 The CIM Schema description of this property applies.

334 The possible values for the ValueRange property are as follows:

- 335 • 0 (“Point”) indicates that the component CIM_ResourceAllocationSettingData instance provides
336 a single set of values.
- 337 • 1 (“Minimums”) indicates that this CIM_ResourceAllocationSettingData instance provides
338 minimum values for numeric properties with a linear range. Unless restricted by a “Maximums”
339 value on the same set of properties, all values that collate higher than the specified values are
340 also considered to be supported by the associated capabilities instance.
- 341 • 2 (“Maximums”) indicates that this CIM_ResourceAllocationSettingData instance provides
342 maximum values for numeric properties with a linear range. Unless restricted by a “Minimums”
343 value on the same set of properties, all values that collate lower than the specified values are
344 also considered to be supported by the associated capabilities instance.
- 345 • 3 (“Increments”) indicates that this CIM_ResourceAllocationSettingData instance provides
346 increment values for numeric properties. These values represent the respective increment
347 between the maximum and minimum values of the supported numeric settings.

348 7 Implementation

349 This section details the requirements related to the arrangement of instances and properties of those
350 instances for implementations of this profile.

351 Each instance of CIM_AllocationCapabilities shall be associated with one or more instances of
352 CIM_ManagedElement through the CIM_ElementCapabilities association class.

353 Each instance of CIM_AllocationCapabilities shall be associated with zero or more instances of
354 CIM_ResourceAllocationSettingData through the CIM_SettingsDefineCapabilities association class. The
355 ResourceType property for each instance of CIM_ResourceAllocationSettingData associated with an
356 instance of CIM_AllocationCapabilities through the CIM_SettingsDefineCapabilities association shall have
357 the same value as the ResourceType property of the CIM_AllocationCapabilities instance.

358 If a CIM_ResourceAllocationSettingData instance has an associated CIM_AllocationCapabilities instance
359 to represent the mutability of its properties and no non-null values are found for a property in the instance
360 or instances of CIM_ResourceAllocationSettingData associated to the CIM_AllocationCapabilities
361 instance with the CIM_SettingsDefineCapabilities association that property is not mutable.

362 If multiple CIM_AllocationCapabilities instances are associated through the CIM_ElementCapabilities
363 association class to a single instance of CIM_ManagedElement, each instance of
364 CIM_AllocationCapabilities and associated CIM_ResourceAllocationSettingData instances shall define
365 one correlated set. A setting from one set shall not be combined with a setting from another set to define
366 a valid allocation request for a given resource.

367 7.1 Default Class CIM_AllocationCapabilities – Optional

368 The default CIM_AllocationCapabilities instance of a given resource type associated with a managed
369 element may be modeled. This section describes the behavioral requirements if a default
370 CIM_AllocationCapabilities instance is modeled.

371 The CIM_ElementCapabilities instance that associates the CIM_AllocationCapabilities instance of a given
372 resource type to a managed element that represents a default CIM_AllocationCapabilities instance shall
373 be implemented as specified in section 10.3. Each instance of CIM_ManagedElement shall be referenced
374 by at most one instance of CIM_ElementCapabilities as specified in section 10.3 for a given resource
375 type. This implies that at most a single default CIM_AllocationCapabilities instance for a given resource
376 type may be associated to a managed element.

377 7.2 Modeling Default Settings – Optional

378 The default resource allocation settings for a CIM_AllocationCapabilities instance associated with a
379 managed element may be modeled. This section describes the behavioral requirements if the default
380 allocation settings are modeled.

381 The CIM_SettingsDefineCapabilities instance that associates the CIM_ResourceAllocationSettingData
382 representing the default settings with the CIM_AllocationCapabilities instance shall be implemented as
383 specified in section 10.5. Each instance of CIM_AllocationCapabilities shall be referenced by at most one
384 instance of CIM_SettingsDefineCapabilities implemented as specified in section 10.5. This implies that at
385 most a single default resource allocation settings exists and is modeled with a single instance of
386 CIM_ResourceAllocationSettingData.

387 7.3 Modeling Minimum Settings – Optional

388 The minimum resource allocation settings for a CIM_AllocationCapabilities instance associated with a
389 managed element may be modeled. This section describes the behavioral requirements if the minimum
390 allocation settings are modeled.

391 The CIM_SettingsDefineCapabilities instance that associates the CIM_ResourceAllocationSettingData
392 representing the minimum settings with the CIM_AllocationCapabilities instance shall be implemented as
393 specified in section 10.6. Each instance of CIM_AllocationCapabilities shall be referenced by at most one
394 instance of CIM_SettingsDefineCapabilities implemented as specified in section 10.6. This implies that at
395 most a single minimum resource allocation settings exists and is modeled with a single instance of
396 CIM_ResourceAllocationSettingData.

397 7.4 Modeling Maximum Settings – Optional

398 The maximum resource allocation settings for a CIM_AllocationCapabilities instance associated with a
399 managed element may be modeled. This section describes the behavioral requirements if the maximum
400 allocation settings are modeled.

401 The CIM_SettingsDefineCapabilities instance that associates the CIM_ResourceAllocationSettingData
402 representing the maximum settings with the CIM_AllocationCapabilities instance shall be implemented as
403 specified in section 10.7. Each instance of CIM_AllocationCapabilities shall be referenced by at most one
404 instance of CIM_SettingsDefineCapabilities implemented as specified in section 10.7. This implies that at
405 most a single maximum resource allocation settings exists and is modeled with a single instance of
406 CIM_ResourceAllocationSettingData.

407 7.5 Modeling Increment Settings – Optional

408 The increment resource allocation settings for a CIM_AllocationCapabilities instance associated with a
409 managed element may be modeled. This section describes the behavioral requirements if the increment
410 allocation settings are modeled.

411 The CIM_SettingsDefineCapabilities instance that associates the CIM_ResourceAllocationSettingData
412 representing the increment settings with the CIM_AllocationCapabilities instance shall be implemented as
413 specified in section 10.8. Each instance of CIM_AllocationCapabilities shall be referenced by at most one
414 instance of CIM_SettingsDefineCapabilities implemented as specified in section 10.8. This implies that at
415 most a single increment resource allocation settings exists and is modeled with a single instance of
416 CIM_ResourceAllocationSettingData.

417 **7.6 Modeling Supported Point Settings – Optional**

418 The supported point resource allocation settings for a CIM_AllocationCapabilities instance associated
419 with a managed element may be modeled. This section describes the behavioral requirements if the
420 supported allocation settings for a managed element are modeled.

421 The CIM_SettingsDefineCapabilities instance that associated the CIM_ResourceAllocationSettingData
422 representing the supported point settings with the CIM_AllocationCapabilities instance shall be
423 implemented as specified in section 10.9.

424 **8 Methods**

425 This section details the requirements for supporting intrinsic operations and extrinsic methods for the CIM
426 elements defined by this profile.

427 **8.1 Profile Conventions for Operations**

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

430 The default list of operations for all classes is as follows:

- 431 • GetInstance()
- 432 • EnumerateInstances()
- 433 • EnumerateInstanceNames()

434 For classes that are referenced by an association, the default list also includes

- 435 • Associators()
- 436 • AssociatorNames()
- 437 • References()
- 438 • ReferenceNames()

439 **8.2 CIM_AllocationCapabilities**

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

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

442 **8.3 CIM_ResourceAllocationSettingData**

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

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

445 **8.4 CIM_SettingsDefineCapabilities**

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

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

450 **Table 2 – Operations: CIM_SettingsDefineCapabilities**

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

451 **8.5 CIM_ElementCapabilities**

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

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

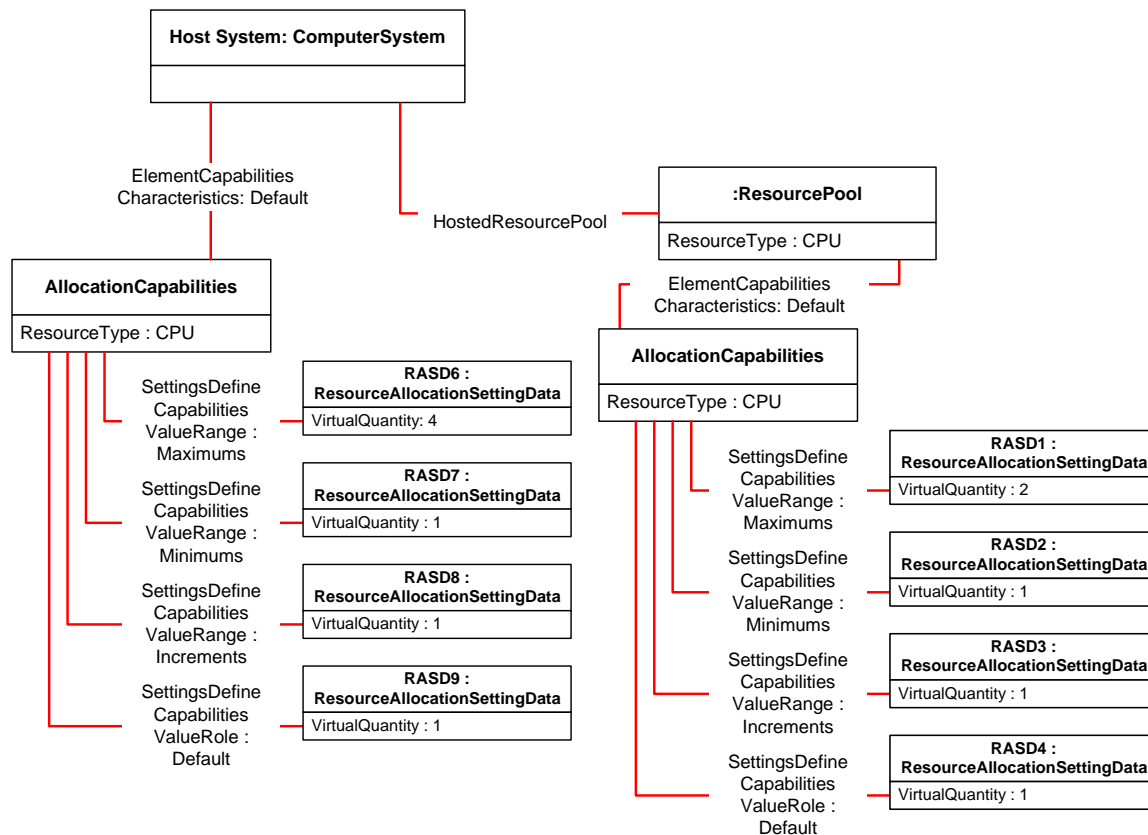
456 **Table 3 – Operations: CIM_ElementCapabilities**

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

457 **9 Use Cases**

458 This section contains object diagrams and use cases for the DMTF Allocation Capabilities Profile. Use
 459 cases are informative and are not intended to define the requirements for conformance.

460 CIM_AllocationCapabilities and its associated set of CIM_ResourceAllocationSettingData instances
 461 define the allocation capability for a given resource type of a host system or resource pool, or describes
 462 the mutability and the valid ranges for change of a CIM_ResourceAllocationSettingData instance.
 463 Figure 2 demonstrates uses of CIM_AllocationCapabilities to represent the allocation capabilities of a
 464 virtualization system and one resource pool within the virtualization system. Figure 3 demonstrates the
 465 use of CIM_AllocationCapabilities to represent the mutability of a property within an associated Current
 466 CIM_ResourceAllocationSettingData.



467

468 **Figure 2 – Allocation Capabilities Associated to CIM_ComputerSystem and CIM_ResourcePool**469 **9.1 Associating CIM_AllocationCapabilities with a Host System**

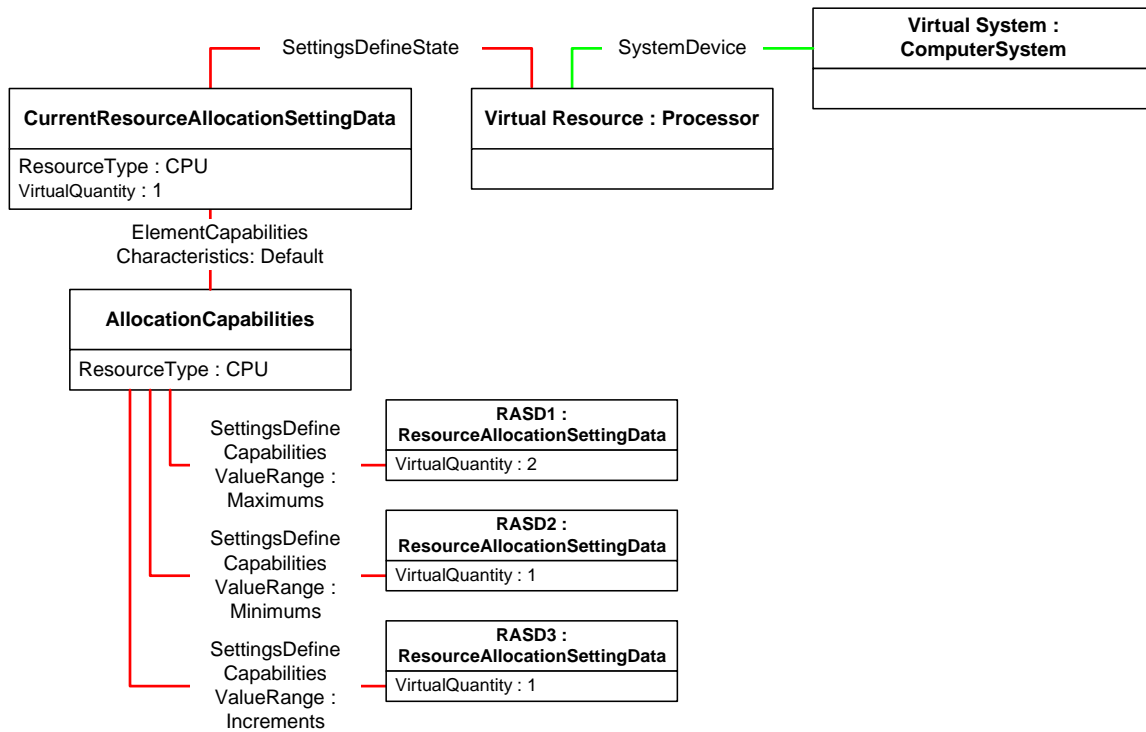
470 The CIM_AllocationCapabilities instance associated to the host system defines the allocation capabilities
 471 of the host system for a resource type. In Figure 2 the host system is capable of accepting allocation
 472 requests for systems with up to 4 CPUs and a minimum of one CPU or if no value for CPU VirtualQuantity
 473 is specified in an allocation request the default value of 1 is used.

474 **9.2 Associating CIM_AllocationCapabilities with a Resource Pool**

475 The CIM_AllocationCapabilities instance associated to the resource pool defines the allocation
 476 capabilities of the resource pool. This usage allows a host system to present the capabilities of multiple
 477 resource pools for a resource type. As illustrated in Figure 2, the capability set for this specific CPU
 478 resource pool subsets the overall capabilities of the virtualization system. The specific resource pool
 479 instance in the figure limits the maximum CPUs in a virtual system to two.

480 **9.3 Associating CIM_AllocationCapabilities with a
481 CIM_ResourceAllocationSettingData Instance**

482 As shown in Figure 3, the instance of CIM_AllocationCapabilities that is associated to the current
 483 CIM_ResourceAllocationSettingData instances specifies the mutability of the VirtualQuantity property in
 484 the associated Current CIM_ResourceAllocationSettingData instance. Figure 3 shows a capability set of a
 485 current CIM_ResourceAllocationSettingData associated to a single instance of CIM_Processor. This
 486 specifies that the VirtualQuantity property in the Current CIM_ResourceAllocationSettingData can be
 487 changed from 1 to 2.



488

489

Figure 3 – Allocation Capabilities Associated to CIM_ResourceAllocationSettingData

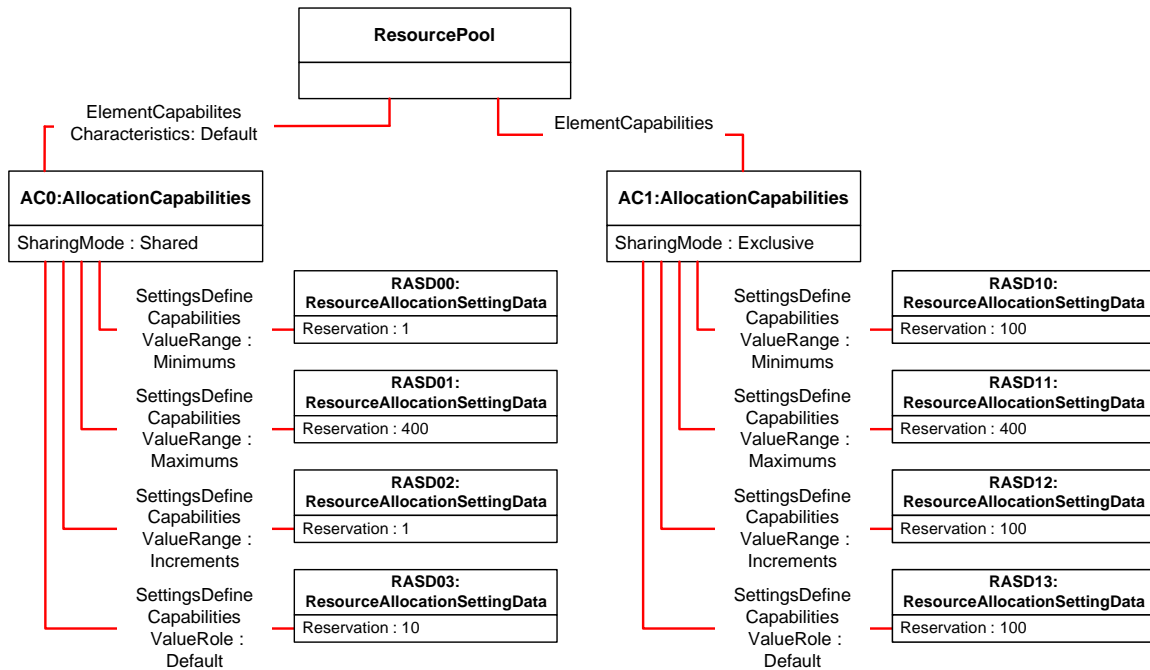
490 **9.4 Associating Multiple CIM_AllocationCapabilities with One Resource Pool**
 491 **Instance**

492 Figure 4 shows an example in which multiple capability sets are used to express multiple capabilities of a
 493 single resource pool. This example shows a system that allows either shared or exclusive access of a
 494 resource. Based on the type of allocation selected the Default, Minimum and Increment
 495 CIM_ResourceAllocationSettingData instances reflect different property values. Each capability set
 496 defines one correlated set. A setting from one set may not be combined with a setting from another set to
 497 form a valid allocation request for a given resource.

498 While this example is based on the SharingMode property in CIM_AllocationCapabilities, other
 499 possibilities exist. For example, different capability sets may be based on the AllocationUnits property in
 500 CIM_ResourceAllocationSettingData.

501 The property CIM_ElementCapabilities.Characteristics set to 2 (“Default”) shows that the
 502 CIM_AllocationCapabilities instance AC0 represents the default capability set for this resource pool.

503 This same pattern applies to capability sets associated with a host system or
 504 CIM_ResourceAllocationSettingData, as well as to the example shown in Figure 4.



505

506

Figure 4 – Multiple CIM_AllocationCapabilities Instances

507 9.5 Discovering a Host System's Allocation Capability for a Given Resource 508 Type

509 The client can enumerate the CIM_AllocationCapabilities instances associated to the target
510 CIM_ComputerSystem (host system) with the CIM_ElementCapabilities association, filtering on the
511 CIM_AllocationCapabilities.ResourceType property to select only the CIM_AllocationCapabilities
512 instances of the desired resource type.

513 9.6 Discovering the Allocation Capability for a Given Resource Type for a 514 Specific Resource Pool

515 The client enumerates the CIM_ResourcePool instances by filtering on the
516 CIM_ResourcePool.ResourceType property to select only the CIM_ResourcePool instances of the
517 desired resource type. For each of the target instances of CIM_ResourcePool select all of the instances
518 of CIM_AllocationCapabilities associated with the CIM_ElementCapabilities association.

519 9.7 Determining the Default Instance of CIM_AllocationCapabilities for a Given 520 Resource Type

521 From the selected CIM_AllocationCapabilities instance(s) (see sections 9.5 and 9.6) the client selects the
522 CIM_AllocationCapabilities instance associated through the CIM_ElementCapabilities association where
523 the value of the CIM_ElementCapabilities.Characteristics property is 2 ("Default").

524 **9.8 Determining the Default, Supported Point and Valid Ranges of Property** 525 **Values Representing the Allocation Capability from a Selected Instance of** 526 **CIM_AllocationCapabilities**

527 The client finds the CIM_ResourceAllocationSettingData instance associated with a selected instance of
528 CIM_AllocationCapabilities (see sections 9.5 and 9.6) through the CIM_SettingsDefineCapabilities
529 association where the value of the CIM_SettingsDefineCapabilities.ValueRole property is 0 (“Default”).
530 The values within the selected CIM_ResourceAllocationSettingData instance represent the default values
531 for the host system or the selected resource pool. A null value specifies that the property is not relevant
532 for the resource type.

533 After determining that there is a non-null default property value, the client finds the
534 CIM_ResourceAllocationSettingData instances associated with a selected instance of
535 CIM_AllocationCapabilities (see sections 9.5 and 9.6) through the CIM_SettingsDefineCapabilities
536 association where the value of the CIM_SettingsDefineCapabilities.ValueRole property is 3 (“Supported”) and the value of the CIM_SettingsDefineCapabilities.ValueRange property is 0 (“Point”). The set of non-null values for a given property within the selected set of CIM_ResourceAllocationSettingData represents supported values for that property.

540 For numeric properties the client finds the CIM_ResourceAllocationSettingData instances associated with
541 a selected instance of CIM_AllocationCapabilities (see sections 9.5 and 9.6) through the
542 CIM_SettingsDefineCapabilities associations where the value of the
543 CIM_SettingsDefineCapabilities.ValueRole property is 1 (“Minimums”), 2 (“Maximums”), or 3
544 (“Increments”). The minimum and maximum values define the range of valid parameters. The increment
545 values describe the valid steps within a specified range. Each of these instances represents a limitation
546 on the range of supported values. For example, if a property has a minimum value but no maximum value
547 specified, the maximum is not limited. If the property has a maximum value but no minimum value there is
548 no minimum value.

549 **9.9 Discovering the Supported Changes of a Property Value in an Instance of a** 550 **CIM_ResourceAllocationSettingData**

551 The client enumerates the set of CIM_AllocationCapabilities instances associated with the association
552 CIM_ElementCapabilities to the target CIM_ResourceAllocationSettingData instance.

553 The client finds the CIM_ResourceAllocationSettingData instance associated with a selected instance of
554 CIM_AllocationCapabilities through the CIM_SettingsDefineCapabilities association where the value of
555 the CIM_SettingsDefineCapabilities.ValueRole property is 3 (“Supported”) and the value of the
556 ValueRange property is 0 (“Point”). The set of non-null values for a given property within the selected set
557 of CIM_ResourceAllocationSettingData represents supported point values for that property.

558 For numeric properties the client finds the CIM_ResourceAllocationSettingData instances associated with
559 a selected instance of CIM_AllocationCapabilities through the CIM_SettingsDefineCapabilities
560 associations where the value of the CIM_SettingsDefineCapabilities.ValueRole property is 1
561 (“Minimums”), 2 (“Maximums”), or 3 (“Increments”). The minimum and maximum values define a range of
562 supported values for numeric properties. The increments value describes the valid steps within a
563 specified range. Each of these instances represents a limitation on the range of supported values. For
564 example, if a property has a minimum value but no maximum value specified, the maximum is not limited.
565 If the property has a maximum value but no minimum value specified, the minimum is not constrained.

566 **10 CIM Elements**

567 Table 4 shows the instances of CIM Elements for this profile. Instances of the CIM Elements shall be
 568 implemented as described in Table 4. Sections 7 (“Implementation”) and 8 (“Methods”) may impose
 569 additional requirements on these elements.

570 **Table 4 – CIM Elements: Allocation Capabilities Profile**

Element Name	Requirement	Description
Classes		
CIM_AllocationCapabilities	Mandatory	See section 10.1.
CIM_ElementCapabilities	Mandatory	See section 10.2.
CIM_SettingsDefineCapabilities	Mandatory	See sections 10.3, 10.5, 10.6, 10.7, 10.8, and 10.9.
Indications		
None defined in this profile		

571 **10.1 CIM_AllocationCapabilities**

572 CIM_AllocationCapabilities represents the allocation capabilities of a host system or resource pool or
 573 represents the mutability a CIM_ResourceAllocationSettingData instance.

574 Table 5 provides information about the properties of CIM_AllocationCapabilities.

575 **Table 5 – Class: CIM_AllocationCapabilities**

Elements	Requirement	Notes
InstanceID	Mandatory	Key
ResourceType	Mandatory	None
OtherResourceType	Conditional	Shall be used if ResourceType matches 1 (“Other”)
RequestTypesSupported	Mandatory	None
SharingMode	Mandatory	None
SupportedAddStates	Optional	None
SupportedRemoveStates	Optional	None

576 **10.2 CIM_ElementCapabilities**

577 CIM_ElementCapabilities associates an instance of CIM_AllocationCapabilities with a subclass of
 578 CIM_ManagedElement assumed to be CIM_System, CIM_ResourcePool, or
 579 CIM_ResourceAllocationSettingData.

580 Table 6 defines the properties of CIM_ElementCapabilities.

581 **Table 6 – Class: CIM_ElementCapabilities**

Properties	Requirement	Notes
ManagedElement	Mandatory	Key Cardinality 1..*
Capabilities	Mandatory	Key Shall be a reference to the CIM_AllocationCapabilities instance Cardinality *
Characteristics	Mandatory	

582 **10.3 CIM_ElementCapabilities – Default**

583 CIM_ElementCapabilities associates an instance of CIM_AllocationCapabilities with a subclass of
 584 CIM_ManagedElement assumed to be CIM_System, CIM_ResourcePool, or
 585 CIM_ResourceAllocationSettingData representing the default capabilities.

586 Table 6 defines the properties of CIM_ElementCapabilities.

587 **Table 7 – Class: CIM_ElementCapabilities (Default)**

Properties	Requirement	Notes
ManagedElement	Mandatory	Key Cardinality 1
Capabilities	Mandatory	Key Shall be a reference to a default CIM_AllocationCapabilities instance Cardinality 1
Characteristics	Mandatory	Matches 2 “Default”

588 **10.4 CIM_SettingsDefineCapabilities**

589 CIM_SettingsDefineCapabilities associates a CIM_ResourceAllocationSettingData instance, representing
 590 the settable or mutable allocation settings for a resource, with a CIM_AllocationCapabilities instance.

591 Table 8 provides information about the properties of CIM_SettingsDefineCapabilities.

592

Table 8 – Class: CIM_SettingsDefineCapabilities

Elements	Requirement	Notes
GroupComponent	Mandatory	Shall be a reference to an instance of CIM_AllocationCapabilities Cardinality 1
PartComponent	Mandatory	Shall be a reference to an instance of CIM_ResourceAllocationSettingData Cardinality 1..*
PropertyPolicy	Mandatory	
ValueRole	Mandatory	
ValueRange	Mandatory	

593 **10.5 CIM_SettingsDefineCapabilities – Default**

594 CIM_SettingsDefineCapabilities associates a CIM_ResourceAllocationSettingData instance, representing
595 default allocation settings for a resource, with a CIM_AllocationCapabilities instance.

596 Table 9 provides information about the properties of CIM_SettingsDefineCapabilities (Default).

597

Table 9 – Class: CIM_SettingsDefineCapabilities (Default)

Elements	Requirement	Notes
GroupComponent	Mandatory	Shall be a reference to an instance of CIM_AllocationCapabilities Cardinality 1
PartComponent	Mandatory	Shall be a reference to an instance of CIM_ResourceAllocationSettingData Cardinality 1
PropertyPolicy	Mandatory	Matches 0 (“Independent”)
ValueRole	Mandatory	Matches 0 (“Default”)
ValueRange	Mandatory	Matches 0 (“Point”)

598 **10.6 CIM_SettingsDefineCapabilities – Minimums**

599 CIM_SettingsDefineCapabilities associates a CIM_ResourceAllocationSettingData instance representing
 600 the minimum values of valid numeric settings to a CIM_AllocationCapabilities instance.

601 Table 10 provides information about the properties of CIM_SettingsDefineCapabilities (Minimums).

602 **Table 10 – Class: CIM_SettingsDefineCapabilities (Minimums)**

Elements	Requirement	Notes
GroupComponent	Mandatory	Shall be a reference to an instance of CIM_AllocationCapabilities Cardinality 1
PartComponent	Mandatory	Shall be a reference to an instance of CIM_ResourceAllocationSettingData Cardinality 1
PropertyPolicy	Mandatory	Matches 0 (“Independent”)
ValueRole	Mandatory	Matches 3 (“Supported”)
ValueRange	Mandatory	Matches 1 (“Minimums”)

603 **10.7 CIM_SettingsDefineCapabilities – Maximums**

604 CIM_SettingsDefineCapabilities associates a CIM_ResourceAllocationSettingData instance representing
 605 the maximum values of valid numeric settings to a CIM_AllocationCapabilities instance.

606 Table 11 provides information about the properties of CIM_SettingsDefineCapabilities (Maximums).

607 **Table 11 – Class: CIM_SettingsDefineCapabilities (Maximums)**

Elements	Requirement	Notes
GroupComponent	Mandatory	Shall be a reference to an instance of CIM_AllocationCapabilities Cardinality 1
PartComponent	Mandatory	Shall be a reference to an instance of CIM_ResourceAllocationSettingData Cardinality 1
PropertyPolicy	Mandatory	Matches 0 (“Independent”)
ValueRole	Mandatory	Matches 3 (“Supported”)
ValueRange	Mandatory	Matches 2 (“Maximums”)

608 **10.8 CIM_SettingsDefineCapabilities – Increments**

609 CIM_SettingsDefineCapabilities associates a CIM_ResourceAllocationSettingData instance, representing
 610 the increment between the maximum and minimum values of supported numeric settings, to a
 611 CIM_AllocationCapabilities instance.

612 Table 12 provides information about the properties of CIM_SettingsDefineCapabilities (Increments).

613 **Table 12 – Class: CIM_SettingsDefineCapabilities (Increments)**

Elements	Requirement	Notes
GroupComponent	Mandatory	Shall be a reference to an instance of CIM_AllocationCapabilities Cardinality 1
PartComponent	Mandatory	Shall be a reference to an instance of CIM_ResourceAllocationSettingData Cardinality 1
PropertyPolicy	Mandatory	Matches 0 (“Independent”)
ValueRole	Mandatory	Matches 3 (“Supported”)
ValueRange	Mandatory	Matches 3 (“Increments”)

614 **10.9 CIM_SettingsDefineCapabilities – Supported Point**

615 CIM_SettingsDefineCapabilities associates a CIM_ResourceAllocationSettingData instance, representing
 616 the settable or mutable allocation settings for a resource, with a CIM_AllocationCapabilities instance.

617 Table 13 provides information about the properties of CIM_SettingsDefineCapabilities (Independent
 618 Supported Point).

619 **Table 13 – Class: CIM_SettingsDefineCapabilities (Independent Supported Point)**

Elements	Requirement	Notes
GroupComponent	Mandatory	Shall be a reference to an instance of CIM_AllocationCapabilities Cardinality 1
PartComponent	Mandatory	Shall be a reference to an instance of CIM_ResourceAllocationSettingData Cardinality 1..*
PropertyPolicy	Mandatory	Matches 0 (“Independent”) or 1 (“Correlated”)
ValueRole	Mandatory	Matches 3 (“Supported”)
ValueRange	Mandatory	Matches 0 (“Point”)

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ANNEX A (informative)

Change Log

Version	Date	Author	Description
1.0.0a	2007/10/16	John Parchem	Preliminary Standard
1.0.0b	2009/04/30	Larry Lamers	DMTF Standard
1.0.0c	2009/05/27	Larry Lamers	Updated clause 8 per TC directive
1.0.0	2009/06/22		DMTF Standard Release

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