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Cloud Infrastructure Management Interface (CIMI) Model and RESTful HTTP-based Protocol — An Interface for Managing Cloud Infrastructure

Model d'interface de management de l'infrastructure du nuage informatique (CIMI) et protocole RESTful basé HTTP — Une interface pour le management de l'infrastructure du nuage informatique

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Foreword

The *Cloud Infrastructure Management Interface (CIMI) Model and RESTful HTTP-based Protocol* specification (DSP0263) was prepared by the DMTF Cloud Management Working Group. It defines a logical model for the management of resources within the Infrastructure as a Service domain.

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

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Cloud Infrastructure Management Interface (CIMI) Model and RESTful HTTP-based Protocol

1 Scope

This specification describes the model and protocol for management interactions between a cloud Infrastructure as a Service (IaaS) Provider and the Consumers of an IaaS service. The basic resources of IaaS (machines, storage, and networks) are modeled with the goal of providing Consumer management access to an implementation of IaaS and facilitating portability between cloud implementations that support the specification. This document specifies a Representational State Transfer (REST)-style protocol using HTTP. However, the underlying model is not specific to HTTP, and it is possible to map it to other protocols as well.

CIMI addresses the management of the lifecycle of infrastructure provided by a Provider. CIMI does not extend beyond infrastructure management to the control of the applications and services that the Consumer chooses to run on the infrastructure provided as a service by the Provider. Although CIMI may be to some extent applicable to other cloud service models, such as Platform as a Service ("PaaS") or Storage as a Service ("SaaS"), these uses are outside the design goals of CIMI.

1.1 Document structure

This document defines a model and a RESTful HTTP-based protocol.

The core REST patterns are defined first and, after each resource is defined, any HTTP-specific information for that resource is specified.

1.2 Document versioning scheme

This document adheres to the versioning scheme defined in clause 6.3 of DSP4004.

As the specification changes over time certain features might be deprecated. These are identified in the specification and should not be supported. Each of these deprecated features is clearly denoted in the clause in which they were previously defined.

1.3 Typographical conventions

This specification uses the following conventions:

In the narrative text of the specification:

- The regular or narrative font is Arial.
- Proper CIMI nouns such as Resource names, attribute names, operation names, reserved variable names are in `Courier` font. (e.g. `Machine`, `volumes`, `$expand`). The plural form applies to such names to indicate several instances of such Resources (e.g. `Machines`, `Systems`).
- Examples text are in small `Courier` font and over a darker background.
- Quotes are used for any text that needs be distinguished as name or value of a particular concept (e.g. the "value constraints" attribute, the “Resource Name” column, a “false” value). In such cases, the string in quotes is always qualified by the concept it is an instance of.
- Names for CIMI concepts that may be common English words but have a very specific meaning in CIMI, are in narrative font but capitalized, e.g. Provider, Consumer, Resource, Collection.

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When used in their common English sense they remain lower-case. However, CIMI modeling concepts that are used in a commonly understood manner remain in lower-case, such as: attribute, operation.

Inside tables describing the Resource data model:

- The narrative font is used for all terms, as the table structure qualifies them sufficiently.
- Where textual descriptions are introduced, the rules for narrative text apply.
- If a name is used as types (i.e., names of embedded structures as well as atomic types such as "integer", "string"), are in *italic*.
- Names that are just placeholders for actual names that may vary with each model instance, are between < > (e.g., <componentTemplate>).

Where the serialization of Resources is described, a pseudo-schema notation is used with the following conventions:

- Values in *italics* indicate data types instead of literal values.
- Characters are appended to items to indicate cardinality:
  - "?" (0 or 1)
  - "*" (0 or more)
  - "+" (1 or more)
- Vertical bars, "|", denote choice. For example, "a|b" means a choice between "a" and "b".
- Parentheses, "(" and ")", are used to indicate the scope of the operators "?", "*", "+" and "|".
- Ellipses (i.e., "...") indicate points of extensibility. Note that the lack of an ellipses does not mean no extensibility point exists, rather it is just not explicitly called out - usually for the sake of brevity.

Operation names Create, Update, Delete, Read are abstract operations that convey the semantics of concrete corresponding operations, such as HTTP methods or CIMI operation URIs.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated or versioned references, only the edition cited (including any corrigenda or DMTF update versions) applies. For references without a date or version, the latest published edition of the referenced document (including any corrigenda or DMTF update versions) applies.

DMTF DSP0223, *Generic Operations 1.0*,
http://www.dmtf.org/standards/published_documents/DSP0223_1.0.pdf

DMTF DSP0243, *Open Virtualization Format Specification 1.1*,
http://www.dmtf.org/sites/default/files/standards/documents/DSP0243_1.1.pdf

DMTF DSP1001, *Management Profile Specification Usage Guide 1.1,*
http://www.dmtf.org/standards/published_documents/DSP1001_1.1.pdf

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http://www.dmtf.org/sites/default/files/standards/documents/DSP4004_2.4.pdf

IANA HTTP Header Registry, http://www.iana.org/assignments/message-headers/perm-headers.html

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