Abstract

This guide describes Red Hat Enterprise Virtualization's Representational State Transfer API.
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CHAPTER 1. INTRODUCTION

Red Hat Enterprise Virtualization Manager provides a Representational State Transfer (REST) API. The API provides software developers and system administrators with control over their Red Hat Enterprise Virtualization environment outside of the standard web interface. The REST API is useful for developers and administrators who aim to integrate the functionality of a Red Hat Enterprise Virtualization environment with custom scripts or external applications that access the API via the standard Hypertext Transfer Protocol (HTTP).

The benefits of the REST API are:

- Broad client support - Any programming language, framework, or system with support for HTTP protocol can use the API;
- Self descriptive - Client applications require minimal knowledge of the virtualization infrastructure as many details are discovered at runtime;
- Resource-based model - The resource-based REST model provides a natural way to manage a virtualization platform.

This provides developers and administrators with the ability to:

- Integrate with enterprise IT systems.
- Integrate with third-party virtualization software.
- Perform automated maintenance or error checking tasks.
- Automate repetitive tasks in a Red Hat Enterprise Virtualization environment with scripts.

This documentation acts as a reference to the Red Hat Enterprise Virtualization Manager REST API. It aims to provide developers and administrators with instructions and examples to help harness the functionality of their Red Hat Enterprise Virtualization environment through the REST API either directly or using the provided Python libraries.

1.1. REPRESENTATIONAL STATE TRANSFER

Representational State Transfer (REST) is a design architecture that focuses on resources for a specific service and their representations. A resource representation is a key abstraction of information that corresponds to one specific managed element on a server. A client sends a request to a server element located at a Uniform Resource Identifier (URI) and performs operations with standard HTTP methods, such as GET, POST, PUT, and DELETE. This provides a stateless communication between the client and server where each request acts independent of any other request and contains all necessary information to complete the request.

1.2. RED HAT ENTERPRISE VIRTUALIZATION REST API
PREREQUISITES

Red Hat Enterprise Virtualization REST API Prerequisites

- A networked installation of Red Hat Enterprise Virtualization Manager, which includes the REST API.
- A client or programming library that initiates and receives HTTP requests from the REST API. For example:
- Python software development kit (SDK)
- Java software development kit (SDK)
- cURL command line tool
- RESTClient, a debugger for RESTful web services


- Knowledge of Extensible Markup Language (XML) or JavaScript Object Notation (JSON), which the API uses to construct resource representations. The W3C provides a full specification on XML at [http://www.w3.org/TR/xml/](http://www.w3.org/TR/xml/). ECMA International provide a free publication on JSON at [http://www.ecma-international.org](http://www.ecma-international.org).
CHAPTER 2. AUTHENTICATION AND SECURITY

2.1. TLS/SSL CERTIFICATION

The Red Hat Enterprise Virtualization Manager API requires Hypertext Transfer Protocol Secure (HTTPS) for secure interaction with client software, such as the Manager’s SDK and CLI components. This involves a process of obtaining a certificate from the Red Hat Enterprise Virtualization Manager and importing it into the certificate store of your client.

IMPORTANT

Obtain your certificate from the Red Hat Enterprise Virtualization Manager using a secure network connection.

Procedure 2.1. Obtaining a Certificate

You can obtain a certificate from the Red Hat Enterprise Virtualization Manager and transfer it to the client machine using one of three methods:

1. **Method 1** - Use a command line tool to download the certificate from the Manager. Examples of command line tools include **cURL** and **Wget**, both of which are available on multiple platforms.
   
   a. If using **cURL**:
      
      ```
      $ curl -o rhevm.cer http://[rhevm-server]/ca.crt
      ```
   
   b. If using **Wget**:
      
      ```
      $ wget -O rhevm.cer http://[rhevm-server]/ca.crt
      ```

2. **Method 2** - Use a web browser to navigate to the certificate located at:

   ```
   http://[rhevm-server]/ca.crt
   ```

   Depending on the chosen browser, the certificate either downloads or imports into the browser’s keystore.

   a. **If the browser downloads the certificate**: save the file as **rhevm.cer**.
   
   b. **If the browser imports the certificate**: export it from the browser’s certification options and save it as **rhevm.cer**.

3. **Method 3** - Log in to the Manager, export the certificate from the truststore and copy it to your client machine.

   a. Log in to the Manager as the **root** user.
   
   b. Export the certificate from the truststore using the Java **keytool** management utility:
      
      ```
      $ keytool -exportcert -keystore /etc/pki/ovirt-engine/.truststore -alias cacert -storepass mypass -file rhevm.cer
      ```

      This creates a certificate file called **rhevm.cer**.
c. Copy the certificate to the client machine using the `scp` command:

```
$ scp rhevm.cer [username]@[client-machine]:[directory]
```

Each of these methods results in a certificate file named `rhevm.cer` on your client machine. An API user imports this file into the certificate store of the client.

### Procedure 2.2. Importing a Certificate to a Client

- Importing a certificate to a client relies on how the client itself stores and interprets certificates. This guide contains some examples on importing certificates. For clients not using Network Security Services (NSS) or Java KeyStore (JKS), see your client documentation for more information on importing a certificate.

### 2.2. HTTP AUTHENTICATION

Any user with a Red Hat Enterprise Virtualization account has access to the REST API. An API user submits a mandatory Red Hat Enterprise Virtualization Manager user name and password with all requests to the API. Each request uses HTTP Basic Authentication to encode these credentials. If a request does not include an appropriate `Authorization` header, the API sends a `401 Authorization Required` as a result:

**Example 2.1. Access to the REST API without appropriate credentials**

```
HEAD [base] HTTP/1.1
Host: [host]

HTTP/1.1 401 Authorization Required
```

Request are issued with an `Authorization` header for the specified realm. An API user encodes an appropriate Red Hat Enterprise Virtualization Manager domain and user in the supplied credentials with the `username@domain:password` convention.

The following table shows the process for encoding credentials in base64.

**Table 2.1. Encoding credentials for API access**

<table>
<thead>
<tr>
<th>Item</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>username</td>
<td>rhevmadmin</td>
</tr>
<tr>
<td>domain</td>
<td>domain.example.com</td>
</tr>
<tr>
<td>password</td>
<td>123456</td>
</tr>
<tr>
<td>unencoded credentials</td>
<td><a href="mailto:rhevmadmin@domain.example.com">rhevmadmin@domain.example.com</a>:123456</td>
</tr>
<tr>
<td>base64 encoded credentials</td>
<td>cmhldm1hZG1pbkBibGFjay5xdW1yYW5ldC5jb206MTlzNDU2</td>
</tr>
</tbody>
</table>
An API user provides the base64 encoded credentials as shown:

**Example 2.2. Access to the REST API with appropriate credentials**

```
HEAD [base] HTTP/1.1
Host: [host]
Authorization: Basic cmhldm1hZG1pbkBibGFjay5xdW1yYW51dC5jb206MTIzNDU2

HTTP/1.1 200 OK
...
```

**IMPORTANT**

Basic authentication involves potentially sensitive information, such as passwords, sent as plain text. REST API requires Hypertext Transfer Protocol Secure (HTTPS) for transport-level encryption of plain-text requests.

**IMPORTANT**

Some base64 libraries break the result into multiple lines and terminate each line with a newline character. This breaks the header and causes a faulty request. The Authorization header requires the encoded credentials on a single line within the header.

### 2.3. AUTHENTICATION SESSIONS

The API also provides the ability for authentication session support. An API user sends an initial request with authentication details, then sends all subsequent requests using a session cookie to authenticate. The following procedure demonstrates how to use an authenticated session.

**Procedure 2.3. Requesting an authenticated session**

1. Send a request with the `Authorization` and `Prefer: persistent-auth`

```
HEAD [base] HTTP/1.1
Host: [host]
Authorization: Basic cmhldm1hZG1pbkBibGFjay5xdW1yYW51dC5jb206MTIzNDU2
Prefer: persistent-auth

HTTP/1.1 200 OK
...
```

This returns a response with the following header:

```
Set-Cookie: JSESSIONID=5dQja5ubr4yvI2MM2z+LZxrK; Path=/api; Secure
```

Note the `JSESSIONID=` value. In this example the value is `JSESSIONID=5dQja5ubr4yvI2MM2z+LZxrK`. 
2. Send all subsequent requests with the **Prefer: persistent-auth** and **cookie** header with the `JSESSIONID=` value. The **Authorization** is no longer needed when using an authenticated session.

```plaintext
HEAD [base] HTTP/1.1
Host: [host]
Prefer: persistent-auth
cookie: JSESSIONID=5dQja5ubr4yvI2MM2z+LZxrK

HTTP/1.1 200 OK
...
```

3. When the session is no longer required, perform a request to the server without the **Prefer: persistent-auth** header.

```plaintext
HEAD [base] HTTP/1.1
Host: [host]
Authorization: Basic cmhldm1hZG1pbkBibGFjay5xdW1yYW5ldC5jb206MTIzNDU2

HTTP/1.1 200 OK
...
```

---


CHAPTER 3. REST API QUICK START EXAMPLE

This chapter provides an example to demonstrate the REST API's ability to setup a basic Red Hat Enterprise Virtualization environment and create a virtual machine.

In addition to the standard prerequisites, this example requires the following:

- A networked and configured host containing Red Hat Enterprise Virtualization Hypervisor;
- An ISO file containing a desired virtual machine operating system to install. This chapter uses Red Hat Enterprise Linux Server 6 for our installation ISO example; and
- Red Hat Enterprise Virtualization's `engine-iso-uploader` tool to upload your chosen operating system ISO file.

This example uses **cURL** to demonstrate REST requests with a client application. Note that any application capable of HTTP requests can substitute for **cURL**.

**IMPORTANT**

For simplicity, the HTTP request headers in this example omit the **Host:** and **Authorization:** fields. However, these fields are mandatory and require data specific to your installation of Red Hat Enterprise Virtualization Manager.

**IMPORTANT**

All **cURL** examples include placeholders for authentication details (**USER:PASS**) and certificate location (**CERT**). Ensure all requests performed with **cURL** fulfill certification and authentication requirements.

**NOTE**

Red Hat Enterprise Virtualization Manager generates a globally unique identifier (GUID) for the **id** attribute for each resource. Identifier codes in this example might appear different to the identifier codes in your Red Hat Enterprise Virtualization environment.

3.1. EXAMPLE: ACCESS API ENTRY POINT

The following request retrieves a representation of the main entry point of the API.

Example 3.1. Access the API entry point

**Request:**

GET /api HTTP/1.1
Accept: application/xml

cURL command:

```
# curl -X GET -H "Accept: application/xml" -u [USER:PASS] \
   --cacert [CERT] https://[RHEVM Host]:443/api
```
CHAPTER 3. REST API QUICK START EXAMPLE

Result:

HTTP/1.1 200 OK
Content-Type: application/xml

<api>
    <link rel="capabilities" href="/api/capabilities"/>
    <link rel="clusters" href="/api/clusters"/>
    <link rel="clusters/search" href="/api/clusters?search={query}"/>
    <link rel="datacenters" href="/api/datacenters"/>
    <link rel="datacenters/search" href="/api/datacenters?search={query}"/>
    <link rel="events" href="/api/events"/>
    <link rel="events/search" href="/api/events?search={query}"/>
    <link rel="hosts" href="/api/hosts"/>
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    <link rel="groups" href="/api/groups"/>
    <link rel="domains" href="/api/domains"/>
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        <vendor>Red Hat</vendor>
        <version revision="0" build="0" minor="0" major="3"/>
    </product_info>
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        <users>
            <total>1</total>
            <active>1</active>
        </users>
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The entry point provides a user with links to the collections in a virtualization environment. The rel= attribute of each collection link provides a reference point for each link. The next step in this example examines the datacenter collection, which is available through the rel="datacenter" link.

The entry point also contains other data such as product_info, special_objects and summary. This data is covered in chapters outside this example.

3.2. EXAMPLE: LIST DATA CENTER COLLECTION

Red Hat Enterprise Virtualization Manager creates a Default data center on installation. This example uses the Default data center as the basis for our virtual environment.

The following request retrieves a representation of the data center collection:

Example 3.2. List data center collection

Request:
GET /api/datacenters HTTP/1.1
Accept: application/xml

cURL command:
# curl -X GET -H "Accept: application/xml" -u [USER:PASS] \  --cacert [CERT] \  https://[RHEVM Host]:443/api/datacenters

Result:
HTTP/1.1 200 OK
Content-Type: application/xml

<data_centers>
  <data_center href="/api/datacenters/00000002-0002-0002-0002-0000000003ab" id="00000002-0002-0002-0002-0000000003ab">
    <name>Default</name>
    <description>The default Data Center</description>
    <link rel="storagedomains" href="/api/datacenters/00000002-0002-0002-0002-0000000003ab/storagedomains"/>
    <link rel="clusters" href="/api/datacenters/00000002-0002-0002-0002-0000000003ab/clusters"/>
    <link rel="networks" href="/api/datacenters/00000002-0002-0002-0002-0000000003ab/networks"/>
</data_center>
</data_centers>
Note the id code of your **Default** data center. This code identifies this data center in relation to other resources of your virtual environment.

The data center also contains a link to the **storagedomains** sub-collection. The data center uses this sub-collection to attach storage domains from the **storagedomains** main collection, which this example covers later.

### 3.3. EXAMPLE: LIST HOST CLUSTER COLLECTION

Red Hat Enterprise Virtualization Manager creates a **Default** host cluster on installation. This example uses the **Default** cluster to group resources in your Red Hat Enterprise Virtualization environment.

The following request retrieves a representation of the cluster collection:

**Example 3.3. List host clusters collection**

**Request:**

```
GET /api/clusters HTTP/1.1
Accept: application/xml
```

**cURL command:**

```
# curl -X GET -H "Accept: application/xml" -u [USER:PASS] \ 
   --cacert [CERT] \ 
   https://[RHEVM Host]:443/api/clusters
```

**Result:**
HTTP/1.1 200 OK
Content-Type: application/xml

<clusters>
  <cluster id="99408929-82cf-4dc7-a532-9d998063fa95"
           href="/api/clusters/99408929-82cf-4dc7-a532-9d998063fa95">
    <name>Default</name>
    <description>The default server cluster</description>
    <link rel="networks"
           href="/api/clusters/99408929-82cf-4dc7-a532-9d998063fa95/networks"/>
    <link rel="permissions"
           href="/api/clusters/99408929-82cf-4dc7-a532-9d998063fa95/permissions"/>
    <cpu id="Intel Penryn Family"/>
    <data_center id="01a45ff0-915a-11e0-8b87-5254004ac988"
                 href="/api/datacenters/01a45ff0-915a-11e0-8b87-5254004ac988"/>
    <memory_policy>
      <overcommit percent="100"/>
      <transparent_hugepages>
        <enabled>false</enabled>
      </transparent_hugepages>
    </memory_policy>
    <scheduling_policy/>
    <version minor="0" major="3"/>
    <error_handling>
      <on_error>migrate</on_error>
    </error_handling>
  </cluster>
</clusters>

Note the id code of your Default host cluster. This code identifies this host cluster in relation to other resources of your virtual environment.

The Default cluster is associated with the Default data center through a relationship using the id and href attributes of the data_center element.

The networks sub-collection contains a list of associated network resources for this cluster. The next section examines the networks collection in more detail.

3.4. EXAMPLE: LIST LOGICAL NETWORKS COLLECTION

Red Hat Enterprise Virtualization Manager creates a default ovirtmgmt network on installation. This network acts as the management network for Red Hat Enterprise Virtualization Manager to access hypervisor hosts.

This network is associated with our Default cluster and is a member of the Default data center. This example uses the ovirtmgmt network to connect our virtual machines.

The following request retrieves a representation of the logical networks collection:

Example 3.4. List logical networks collection
Request:

GET /api/networks HTTP/1.1
Accept: application/xml

cURL command:

```bash
# curl -X GET -H "Accept: application/xml" -u [USER:PASS] \ # -c -cacert [CERT] \ # https://[RHEVM Host]:443/api/networks
```

Result:

HTTP/1.1 200 OK
Content-Type: application/xml

```xml
<networks>
  <network id="00000000-0000-0000-0000-000000000009" 
    href="/api/networks/00000000-0000-0000-0000-000000000009">
    <name>ovirtmgmt</name>
    <description>Management Network</description>
    <data_center id="01a45ff0-915a-11e0-8b87-5254004ac988" 
      href="/api/datacenters/01a45ff0-915a-11e0-8b87-5254004ac988"/>
    <stp>false</stp>
    <status>
      <state>operational</state>
    </status>
    <display>false</display>
  </network>
</networks>
```

The `ovirtmgmt` network is attached to the **Default** data center through a relationship using the data center's **id** code.

The `ovirtmgmt` network is also attached to the **Default** cluster through a relationship in the cluster's **network** sub-collection.

### 3.5. Example: List Host Collection

This example uses a Red Hat Enterprise Virtualization Hypervisor host. Red Hat Enterprise Virtualization Manager automatically registers any configured Red Hat Enterprise Virtualization Hypervisor. This example retrieves a representation of the hosts collection and shows a Red Hat Enterprise Virtualization Hypervisor host named **hypervisor** registered with the virtualization environment.

**Example 3.5. List hosts collection**

**Request:**

GET /api/hosts HTTP/1.1
Accept: application/xml
cURL command:

```bash
# curl -X GET -H "Accept: application/xml" -u [USER:PASS] \ 
    --cacert [CERT] \ 
    https://[RHEVM Host]:443/api/hosts
```

Result:

```
HTTP/1.1 200 OK
Accept: application/xml

<hosts>
    <host id="0656f432-923a-11e0-ad20-5254004ac988" 
        href="/api/hosts/0656f432-923a-11e0-ad20-5254004ac988">
        <name>hypervisor</name>
        <actions>
            <link rel="install" 
                href="/api/hosts/0656f432-923a-11e0-ad20-5254004ac988/install"/>
            <link rel="activate" 
                href="/api/hosts/0656f432-923a-11e0-ad20-5254004ac988/activate"/>
            <link rel="deactivate" 
                href="/api/hosts/0656f432-923a-11e0-ad20-5254004ac988/deactivate"/>
            <link rel="approve" 
                href="/api/hosts/0656f432-923a-11e0-ad20-5254004ac988/approve"/>
            <link rel="iscsilogin" 
                href="/api/hosts/0656f432-923a-11e0-ad20-5254004ac988/iscsilogin"/>
            <link rel="iscsidiscover" 
                href="/api/hosts/0656f432-923a-11e0-ad20-5254004ac988/iscsidiscover"/>
            <link rel="commitnetconfig" 
                href="/api/hosts/0656f432-923a-11e0-ad20-5254004ac988/commitnetconfig"/>
        </actions>
        <link rel="storage" 
            href="/api/hosts/0656f432-923a-11e0-ad20-5254004ac988/storage"/>
        <link rel="nics" 
            href="/api/hosts/0656f432-923a-11e0-ad20-5254004ac988/nics"/>
        <link rel="tags" 
            href="/api/hosts/0656f432-923a-11e0-ad20-5254004ac988/tags"/>
        <link rel="permissions" 
            href="/api/hosts/0656f432-923a-11e0-ad20-5254004ac988/permissions"/>
        <link rel="statistics" 
            href="/api/hosts/0656f432-923a-11e0-ad20-5254004ac988/statistics"/>
    </host>
    <address>10.64.14.110</address>
</hosts>
```
<status>
    <state>non_operational</state>
</status>
<cluster id="99408929-82cf-4dc7-a532-9d998063fa95" href="/api/clusters/99408929-82cf-4dc7-a532-9d998063fa95"/>
<port>54321</port>
<storage_manager>true</storage_manager>
<power_management>
    <enabled>false</enabled>
    <options/>
</power_management>
<ksm>
    <enabled>false</enabled>
</ksm>
<transparent_hugepages>
    <enabled>true</enabled>
</transparent_hugepages>
<iscsi>
    <initiator>iqn.1994-05.com.example:644949fe81ce</initiator>
</iscsi>
<cpu>
    <topology cores="2"/>
    <name>Intel(R) Core(TM)2 Duo CPU E8400 @ 3.00GHz</name>
    <speed>2993</speed>
</cpu>
<summary>
    <active>0</active>
    <migrating>0</migrating>
    <total>0</total>
</summary>
</host>
</hosts>

Note the id code of your Default host. This code identifies this host in relation to other resources of your virtual environment.

This host is a member of the Default cluster and accessing the nics sub-collection shows this host has a connection to the ovirtmgmt network.

3.6. EXAMPLE: LIST CPU PROFILES

The following request retrieves a representation of the CPU profiles:

Example 3.6. List CPU profiles

Request:

GET /api/cpuprofiles HTTP/1.1
Accept: application/xml

cURL command:
3.7. EXAMPLE: APPROVE HOST

The hypervisor host resource contains an approve action. A user accesses this action's URI with a POST request.
Example 3.7. Approve a pre-configured Red Hat Enterprise Virtualization Hypervisor host

Request:

POST /api/hosts/0656f432-923a-11e0-ad20-5254004ac988/approve HTTP/1.1
Accept: application/xml
Content-type: application/xml

<action/>

CURL command:

# curl -X POST -H "Accept: application/xml" -H "Content-Type: application/xml" \\
-u [USER:PASS] --cacert [CERT] \\
-d "<action/>

https://[RHEVM Host]:443/api/hosts/0656f432-923a-11e0-ad20-5254004ac988/approve

The POST request requires a body for the message entities to initiate an action. Since the action does not require additional parameters, the body contains an empty action element.

Use the approve action only for Red Hat Enterprise Virtualization Hypervisor hosts. Red Hat Enterprise Linux hosts require a different process to connect to the virtualization environment.

This approves and activates the host for use in your virtual environment. The status for hypervisor changes from non_operational to up.

3.8. EXAMPLE: CREATE NFS DATA STORAGE

An NFS data storage domain is an exported NFS share attached to a data center and provides storage for virtualized guest images. Creation of a new storage domain requires a POST request, with the storage domain representation included, sent to the URL of the storage domain collection.

In Red Hat Enterprise Virtualization 3.6 and later you can enable the wipe after delete option by default on the storage domain. To configure this specify <wipe_after_delete> in the POST request. This option can be edited after the domain is created, but doing so will not change the wipe after delete property of disks that already exist.

Example 3.8. Create an NFS data storage domain

Request:

POST /api/storagedomains HTTP/1.1
Accept: application/xml
Content-type: application/xml

<storage_domain>
    <name>data1</name>
    <type>data</type>
    <storage>
        <type>nfs</type>
    </storage>
</storage_domain>
The API creates a NFS data storage domain called **data1** with an export path of **192.168.0.10:/data1** and sets access to the storage domain through the **hypervisor** host. The API also returns the following representation of the newly created storage domain resource.

**Result:**

```
HTTP/1.1 200 OK
Accept: application/xml

<storage_domain id="9ca7cb40-9a2a-4513-acef-dc254af57aac"
    href="/api/storagedomains/9ca7cb40-9a2a-4513-acef-dc254af57aac">
    <name>data1</name>
    <link rel="permissions"
        href="/api/storagedomains/9ca7cb40-9a2a-4513-acef-dc254af57aac/
        permissions"/>
    <link rel="files"
        href="/api/storagedomains/9ca7cb40-9a2a-4513-acef-dc254af57aac/files"/>
    <type>data</type>
    <master>false</master>
    <storage>
        <type>nfs</type>
        <address>192.168.0.10</address>
        <path>/data1</path>
    </storage>
    <available>175019917312</available>
    <used>27917287424</used>
    <committed>10737418240</committed>
    <storage_format>v1</storage_format>
    <host_id="0656f432-923a-11e0-ad20-5254004ac988"
        href="/api/hosts/0656f432-923a-11e0-ad20-5254004ac988">
```

---

### 3.9. EXAMPLE: CREATE NFS ISO STORAGE

```cURL command:

# curl -X POST -H "Accept: application/xml" -H "Content-Type: application/xml"
    -u [USER:PASS] --cacert [CERT] \
    -d "<storage_domain><name>data1</name><type>data</type> \
        <storage><type>nfs</type><address>192.168.0.10</address> \
        <path>/data1</path></storage> \
        <host><name>hypervisor</name></host></storage_domain>"
    https://[RHEVM Host]:443/api/storagedomains
```

The API creates a NFS data storage domain called **data1** with an export path of **192.168.0.10:/data1** and sets access to the storage domain through the **hypervisor** host. The API also returns the following representation of the newly created storage domain resource.
An NFS ISO storage domain is a mounted NFS share attached to a data center and provides storage for DVD/CD-ROM ISO and virtual floppy disk (VFD) image files. Creation of a new storage domain requires a **POST** request, with the storage domain representation included, sent to the URL of the storage domain collection.

In Red Hat Enterprise Virtualization 3.6 and later you can enable the wipe after delete option by default on the storage domain. To configure this specify `<wipe_after_delete>` in the **POST** request. This option can be edited after the domain is created, but doing so will not change the wipe after delete property of disks that already exist.

**Example 3.9. Create an NFS ISO storage domain**

**Request:**

```xml
POST /api/storagedomains HTTP/1.1
Accept: application/xml
Content-type: application/xml

<storage_domain>
  <name>iso1</name>
  <type>iso</type>
  <storage>
    <type>nfs</type>
    <address>192.168.0.10</address>
    <path>/iso1</path>
  </storage>
  <host>
    <name>hypervisor</name>
  </host>
</storage_domain>
```

cURL command:

```bash
# curl -X POST -H "Accept: application/xml" -H "Content-Type: application/xml"
  -u [USER:PASS] --cacert [CERT] \
  -d "<storage_domain><name>iso1</name><type>iso</type>
  <storage><type>nfs</type><address>192.168.0.10</address>
  <path>/iso1</path></storage>
  <host><name>hypervisor</name></host></storage_domain>"
  https://[RHEVM Host]:443/api/storagedomains
```

The API creates a NFS iso storage domain called **iso1** with an export path of **192.168.0.10:/iso1** and gets access to the storage domain through the **hypervisor** host. The API also returns the following representation of the newly created storage domain resource.

**Result:**

```xml
HTTP/1.1 200 OK
Accept: application/xml

<storage_domain id="00f0d9ce-da15-4b9e-9e3e-3c898fa8b6da"
  href="/api/storagedomains/00f0d9ce-da15-4b9e-9e3e-3c898fa8b6da">
  <name>iso1</name>
  <link rel="permissions"
```

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3.10. EXAMPLE: ATTACH STORAGE DOMAINS TO DATA CENTER

The following example attaches the **data1** and **iso1** storage domains to the **Default** data center.

**Example 3.10. Attach data1 storage domain to the Default data center**

**Request:**

POST /api/datacenters/01a45ff0-915a-11e0-8b87-5254004ac988/storagedomains HTTP/1.1
Accept: application/xml
Content-type: application/xml

<storage_domain>
  <name>data1</name>
</storage_domain>

**cURL command:**

```
# curl -X POST -H "Accept: application/xml" -H "Content-Type: application/xml" \\
- u [USER:PASS] --cacert [CERT] \\
- d "<storage_domain><name>data1</name></storage_domain>" \\
https://[RHEVM Host]:443/api/datacenters/01a45ff0-915a-11e0-8b87-5254004ac988/storagedomains
```

**Example 3.11. Attach iso1 storage domain to the Default data center**

**Request:**
POST /api/datacenters/01a45ff0-915a-11e0-8b87-5254004ac988/storagedomains HTTP/1.1
Accept: application/xml
Content-type: application/xml

<storage_domain>
  <name>iso1</name>
</storage_domain>

**cURL command:**

```bash
# curl -X POST -H "Accept: application/xml" -H "Content-Type: application/xml"
  -u [USER:PASS] --cacert [CERT]
  -d "<storage_domain><name>iso1</name></storage_domain>"
  https://[RHEVM Host]:443/api/datacenters/01a45ff0-915a-11e0-8b87-5254004ac988/storagedomains
```

These POST requests place our two new storage_domain resources in the storagedomains sub-collection of the Default data center. This means the storagedomains sub-collection contains attached storage domains of the data center.

### 3.11. EXAMPLE: ACTIVATE STORAGE DOMAINS

This example activates the data1 and iso1 storage domains for the Red Hat Enterprise Virtualization Manager’s use.

**Example 3.12. Activate data1 storage domain**

**Request:**

POST /api/datacenters/d70d5e2d-b8ad-494a-a4d2-c7a5631073c4/storagedomains/9ca7cb40-9a2a-4513-acef-dc254af57aac/activate HTTP/1.1
Accept: application/xml
Content-type: application/xml

```
<action/>
```

**cURL command:**

```bash
# curl -X POST -H "Accept: application/xml" -H "Content-Type: application/xml"
  -u [USER:PASS] --cacert [CERT]
  -d "<action/>
  https://[RHEVM Host]:443/api/datacenters/d70d5e2d-b8ad-494a-a4d2-c7a5631073c4/storagedomains/9ca7cb40-9a2a-4513-acef-dc254af57aac/activate
```

**Example 3.13. Activate iso1 storage domain**
Request:

POST /api/datacenters/d70d5e2d-b8ad-494a-a4d2-c7a5631073c4/storagedomains/00f0d9ce-da15-4b9e-9e3e-3c898fa8b6da/activate HTTP/1.1
Accept: application/xml
Content-type: application/xml

<action/>

cURL command:

https://[RHEVM Host]:443/api/datacenters/d70d5e2d-b8ad-494a-a4d2-c7a5631073c4/storagedomains/00f0d9ce-da15-4b9e-9e3e-3c898fa8b6da/activate

This activates both storage domains for use with the data center.

3.12. EXAMPLE: CREATE VIRTUAL MACHINE

The following example creates a virtual machine called **vm1** on the Default cluster using the virtualization environment's Blank template as a basis. The request also defines the virtual machine's memory as 512 MB and sets the boot device to a virtual hard disk.

Example 3.14. Create a virtual machine

Request:

POST /api/vms HTTP/1.1
Accept: application/xml
Content-type: application/xml

<vm>
  <name>vm1</name>
  <cluster>
    <name>default</name>
  </cluster>
  <template>
    <name>Blank</name>
  </template>
  <memory>536870912</memory>
  <os>
    <boot dev="hd"/>
  </os>
  <cpu_profile id="0000001a-001a-001a-001a-00000000035e"/>
</vm>

cURL command:
CHAPTER 3. REST API QUICK START EXAMPLE

  <name>vm1</name>
  <cluster><name>default</name></cluster>
  <template>
    <name>Blank</name>
  </template>
  <memory>536870912</memory>
  <os><boot dev='hd'/></os>
  <cpu_profile id='0000001a-001a-001a-001a-00000000035e'/>
</vm>" https://[RHEVM Host]:443/api/vms

Result:

HTTP/1.1 200 OK
Accept: application/xml

<vm id="6efc0cfa-8495-4a96-93e5-ee490328cf48"
  href="/api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48">
  <name>vm1</name>
  <actions>
    <link rel="shutdown" href="/api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/shutdown/>
    <link rel="start" href="/api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/start"/>
    <link rel="stop" href="/api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/stop"/>
    <link rel="reboot" href="/api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/reboot"/>
    <link rel="suspend" href="/api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/suspend"/>
    <link rel="detach" href="/api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/detach"/>
    <link rel="export" href="/api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/export"/>
    <link rel="move" href="/api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/move"/>
    <link rel="ticket" href="/api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/ticket"/>
    <link rel="migrate" href="/api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/migrate"/>
    <link rel="undo_snapshot" href="/api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/undo_snapshot"/>
    <link rel="commit_snapshot" href="/api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/commit_snapshot"/>
    <link rel="preview_snapshot" href="/api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/preview_snapshot"/>
    <link rel="logon" href="/api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/logon"/>
    <link rel="cancelmigration" href="/api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/cancelmigration"/>
    <link rel="maintenance" href="/api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/maintenance"/>
  </actions>
</vm>
<link rel="clone" href="/api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/clone"/>
</actions>

<link rel="applications" href="/api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/applications"/>
<link rel="disks" href="/api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/disks"/>
<link rel="nics" href="/api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/nics"/>
<link rel="cdroms" href="/api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/cdroms"/>
<link rel="snapshots" href="/api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/snapshots"/>
<link rel="tags" href="/api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/tags"/>
<link rel="permissions" href="/api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/permissions"/>
<link rel="statistics" href="/api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/statistics"/>
<link rel="reporteddevices" href="/api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/reporteddevices"/>
<link rel="watchdogs" href="/api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/watchdogs"/>
<link rel="sessions" href="/api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/sessions"/>

<type>desktop</type>

<status>
  <state>down</state>
</status>

<memory>536870912</memory>
<cpu>
  <topology cores="1" sockets="1"/>
</cpu>

<os type="Unassigned">
  <boot dev="cdrom"/>
</os>

<high_availability>
  <enabled>false</enabled>
  <priority>0</priority>
</high_availability>

<display>
  <type>spice</type>
  <monitors>1</monitors>
  <single_qxl_pci>false</single_qxl_pci>
  <allow_override>false</allow_override>
  <smartcard_enabled>false</smartcard_enabled>
  <file_transfer_enabled>true</file_transfer_enabled>
  <copy_paste_enabled>true</copy_paste_enabled>
</display>

<cluster id="99408929-82cf-4dc7-a532-9d998063fa95" href="/api/clusters/99408929-82cf-4dc7-a532-9d998063fa95"/>
<template id="00000000-0000-0000-0000-000000000000" href="/api/templates/00000000-0000-0000-0000-000000000000"/>
3.13. EXAMPLE: CREATE VIRTUAL MACHINE NIC

The following example creates a virtual network interface to connect the example virtual machine to the ovirtmgmt network.

Request:

```
POST /api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/nics HTTP/1.1
Accept: application/xml
Content-type: application/xml

<nic>
  <interface>virtio</interface>
  <name>nic1</name>
  <network>
    <ip>
      <address>192.168.1.1/24</address>
      <gateway>192.168.1.254</gateway>
    </ip>
  </network>
</nic>
```
cURL command:

```bash
# curl -X POST -H "Accept: application/xml" -H "Content-Type: application/xml" \
        -u [USER:PASS] --cacert [CERT] \
        -d "<nic><name>nic1</name><network><name>ovirtmgmt</name></network>
        </nic>" \
        https://[RHEVM Host]:443/api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/nics
```

### 3.14. EXAMPLE: CREATE VIRTUAL MACHINE STORAGE DISK

The following example creates an 8 GB Copy-On-Write storage disk for the example virtual machine.

**Example 3.16. Create a virtual machine storage disk**

**Request:**

```
POST /api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/disks HTTP/1.1
Accept: application/xml
Content-type: application/xml
<disk>
    <storage_domains>
        <storage_domain id="9ca7cb40-9a2a-4513-acef-dc254af57aac"/>
    </storage_domains>
    <size>8589934592</size>
    <type>system</type>
    <interface>virtio</interface>
    <format>cow</format>
    <bootable>true</bootable>
</disk>
```

**cURL command:**

```bash
# curl -X POST -H "Accept: application/xml" -H "Content-Type: application/xml" \
        -u [USER:PASS] --cacert [CERT] \
        -d "<disk><storage_domains> \
            <storage_domain id='9ca7cb40-9a2a-4513-acef-dc254af57aac'/> \
            </storage_domains><size>8589934592</size><type>system</type> \
            <interface>virtio</interface><format>cow</format> \
            <bootable>true</bootable></disk>" \
        https://[RHEVM Host]:443/api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/disks
```

The **storage_domain** element tells the API to store the disk on the **data1** storage domain.
3.15. EXAMPLE: ATTACH ISO IMAGE TO VIRTUAL MACHINE

The boot media for our example virtual machine requires an CD-ROM or DVD ISO image for an operating system installation. This example uses a Red Hat Enterprise Server 6 ISO image for installation.

ISO images must be available in the iso1 ISO domain for the virtual machines to use. Red Hat Enterprise Virtualization Platform provides an uploader tool that ensures that the ISO images are uploaded into the correct directory path with the correct user permissions.

Once the ISO is uploaded, an API user requests the ISO storage domain's files sub-collection to view the file resource:

**Example 3.17. View the files sub-collection in an ISO storage domain**

**Request:**

```
GET /api/storagedomains/00f0d9ce-da15-4b9e-9e3e-3c898fa8b6da/files HTTP/1.1
Accept: application/xml
```

**cURL command:**

```
# curl -X GET -H "Accept: application/xml" -u [USER:PASS] --cacert [CERT] \n   https://[RHEVM Host]:443/api/storagedomains/00f0d9ce-da15-4b9e-9e3e-3c898fa8b6da/files
```

The API returns the following representation of the files sub-collection:

```
<files>
  <file id="rhel-server-6.0-x86_64-dvd.iso"
       href="/api/storagedomains/00f0d9ce-da15-4b9e-9e3e-3c898fa8b6da/files/rhel-server-6.0-x86_64-dvd.iso.iso">
    <name>rhel-server-6.0-x86_64-dvd.iso.iso</name>
    <storage_domain id="00f0d9ce-da15-4b9e-9e3e-3c898fa8b6da"
                    href="/api/storagedomains/00f0d9ce-da15-4b9e-9e3e-3c898fa8b6da"/>
  </file>
</files>
```

An API user attaches the **rhel-server-6.0-x86_64-dvd.iso** to our example virtual machine. Attaching an ISO image is equivalent to using the **Change CD** button in the Administration or User Portal.

**Example 3.18. Attach an ISO image to the virtual machine**

**Request:**

```
POST /api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/cdroms HTTP/1.1
Accept: application/xml
Content-type: application/xml
```
<cdrom>
  <file id="rhel-server-6.0-x86_64-dvd.iso"/>
</cdrom>

**cURL command:**

```
# curl -X POST -H "Accept: application/xml" -H "Content-Type: application/xml" \ 
-u [USER:PASS] --cacert [CERT] \ 
-d "<cdrom><file id='rhel-server-6.0-x86_64-dvd.iso'/></cdrom>" \ 
https://[RHEVM Host]:443/api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/cdroms
```

### 3.16. EXAMPLE: START VIRTUAL MACHINE

The virtual environment is complete and the virtual machine contains all necessary components to function. This example starts the virtual machine using the `start` action.

**Example 3.19. Start the virtual machine**

**Request:**

```
POST /api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/start HTTP/1.1
Accept: application/xml
Content-type: application/xml

<action>
  <vm>
    <os>
      <boot dev="cdrom"/>
    </os>
  </vm>
</action>
```

**cURL command:**

```
# curl -X POST -H "Accept: application/xml" -H "Content-Type: application/xml" \ 
-u [USER:PASS] --cacert [CERT] \ 
-d "<action><vm><os><boot dev='cdrom'/></os></vm></action>" \ 
https://[RHEVM Host]:443/api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48/start
```

The additional message entity sets the virtual machine's boot device to CD-ROM for this boot only. This enables the virtual machine to install Red Hat Enterprise Server 6 from the attached ISO image. The boot device reverts back to `disk` for all future boots.

### 3.17. EXAMPLE: CHECK SYSTEM EVENTS
The **start** action for the **vm1** creates several entries in the **events** collection. This example lists the events collection and identifies events specific to the API starting a virtual machine.

### Example 3.20. List the events collection

**Request:**

```
GET /api/events HTTP/1.1
Accept: application/xml
```

**cURL command:**

```
# curl -X GET -H "Accept: application/xml" -u [USER:PASS] \n--cacert [CERT] \nhttps://[RHEVM Host]:443/api/events
```

**Result:**

```
<events>
  ...
  <event id="103" href="/api/events/103">
    <description>User admin logged out.</description>
    <code>31</code>
    <severity>normal</severity>
    <time>2011-06-29T17:42:41.544+10:00</time>
    <user id="80b71bae-98a1-11e0-8f20-525400866c73" href="/api/users/80b71bae-98a1-11e0-8f20-525400866c73"/>
  </event>
  <event id="102" href="/api/events/102">
    <description>vm1 was started by admin (Host: hypervisor).</description>
    <code>153</code>
    <severity>normal</severity>
    <time>2011-06-29T17:42:41.499+10:00</time>
    <user id="80b71bae-98a1-11e0-8f20-525400866c73" href="/api/users/80b71bae-98a1-11e0-8f20-525400866c73"/>
    <vm id="6efc0cfa-8495-4a96-93e5-ee490328cf48" href="/api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48"/>
    <host id="0656f432-923a-11e0-ad20-5254004ac988" href="/api/hosts/0656f432-923a-11e0-ad20-5254004ac988"/>
  </event>
  <event id="101" href="/api/events/101">
    <description>User admin logged in.</description>
    <code>30</code>
    <severity>normal</severity>
    <time>2011-06-29T17:42:40.505+10:00</time>
    <user id="80b71bae-98a1-11e0-8f20-525400866c73" href="/api/users/80b71bae-98a1-11e0-8f20-525400866c73"/>
    <vm id="6efc0cfa-8495-4a96-93e5-ee490328cf48" href="/api/vms/6efc0cfa-8495-4a96-93e5-ee490328cf48"/>
    <host id="0656f432-923a-11e0-ad20-5254004ac988" href="/api/hosts/0656f432-923a-11e0-ad20-5254004ac988"/>
  </event>
  ...
</events>
```

The following events occur:
- **id="101"** - The API authenticates with the **admin** user's user name and password.
- **id="102"** - The API, acting as the **admin** user, starts **vm1** on the **hypervisor** host.
- **id="103"** - The API logs out of the **admin** user account.
CHAPTER 4. ENTRY POINT

A user begins interacting with the API through a GET request on the entry point URI consisting of a host and base.

Example 4.1. Accessing the API Entry Point

If the host is www.example.com and the base is /api, the entry point appears with the following request:

GET /api HTTP/1.1
Accept: application/xml
Host: www.example.com
Authorization: [base64 encoded credentials]

HTTP/1.1 200 OK
Content-Type: application/xml

<api>
  <link rel="hosts" href="/api/hosts"/>
  <link rel="vms" href="/api/vms"/>
  ...
  <product_info>
    <name>Red Hat Enterprise Virtualization</name>
    <vendor>Red Hat</vendor>
    <version revision="0" build="0" minor="1" major="3"/>
  </product_info>
  <special_objects>
    <link rel="templates/blank" href="..."/>
    <link rel="tags/root" href="..."/>
  </special_objects>
  <summary>
    <vms>
      <total>10</total>
      <active>3</active>
    </vms>
    <hosts>
      <total>2</total>
      <active>2</active>
    </hosts>
    <users>
      <total>8</total>
      <active>2</active>
    </users>
    <storage_domains>
      <total>2</total>
      <active>2</active>
    </storage_domains>
  </summary>
</api>
NOTE

For simplicity, all other examples omit the Host: and Authorization: request headers and assume the base is the default /api path. This base path differs depending on your implementation.

4.1. PRODUCT INFORMATION

The entry point contains a product_info element to help an API user determine the legitimacy of the Red Hat Enterprise Virtualization environment. This includes the name of the product, the vendor and the version.

Example 4.2. Verify a genuine Red Hat Enterprise Virtualization environment

The follow elements identify a genuine Red Hat Enterprise Virtualization 3.2 environment:

```xml
<api>
  ...
  <product_info>
    <name>Red Hat Enterprise Virtualization</name>
    <vendor>Red Hat</vendor>
    <version revision="0" build="0" minor="2" major="3"/>
  </product_info>
  ...
</api>
```

4.2. LINK ELEMENTS

Access to the Entry Point provides link elements and URIs for all of the resource collections the API exposes. Each collection uses a relation type to identify the URI a client needs.

Table 4.1. Available Relationship Types

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>capabilities</td>
<td>Supported capabilities of the Red Hat Enterprise Virtualization Manager.</td>
</tr>
<tr>
<td>datacenters</td>
<td>Data centers.</td>
</tr>
<tr>
<td>clusters</td>
<td>Host clusters.</td>
</tr>
<tr>
<td>networks</td>
<td>Virtual networks.</td>
</tr>
<tr>
<td>storagedomains</td>
<td>Storage domains.</td>
</tr>
<tr>
<td>hosts</td>
<td>Hosts.</td>
</tr>
<tr>
<td>vms</td>
<td>Virtual machines.</td>
</tr>
</tbody>
</table>
### CHAPTER 4. ENTRY POINT

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>disks</td>
<td>Virtual machine disks.</td>
</tr>
<tr>
<td>templates</td>
<td>Templates.</td>
</tr>
<tr>
<td>vmpools</td>
<td>Virtual machine pools.</td>
</tr>
<tr>
<td>domains</td>
<td>Identity service domains.</td>
</tr>
<tr>
<td>groups</td>
<td>Imported identity service groups.</td>
</tr>
<tr>
<td>roles</td>
<td>Roles.</td>
</tr>
<tr>
<td>users</td>
<td>Users.</td>
</tr>
<tr>
<td>tags</td>
<td>Tags.</td>
</tr>
<tr>
<td>events</td>
<td>Events.</td>
</tr>
</tbody>
</table>

![Diagram](image.png)

**Figure 4.1.** The relationship between the API entry point and the resource collections exposed by the API

**NOTE**

All URIs shown in example responses are illustrative. The format of all URIs returned by the server is opaque. Clients navigate to specific resources through the entry point URI and use the relationship types to access the URIs.

The server chooses to include absolute URIs or absolute paths [3] in the `link` element's `href` attribute, so clients are required to handle either form.

The `link` elements also contain a set of `search` URIs for certain collections. These URIs use URI templates [4] to integrate search queries. The purpose of the URI template is to accept a search...
expression using the natural HTTP pattern of a query parameter. The client does not require prior knowledge of the URI structure. Thus clients should treat these templates as being opaque and access them with a URI template library.

Each search query URI template is identified with a relation type using the convention "collection/search".

Table 4.2. Relationships associated with search query URIs

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>datacenters/search</td>
<td>Query data centers.</td>
</tr>
<tr>
<td>clusters/search</td>
<td>Query host clusters.</td>
</tr>
<tr>
<td>storagedomains/search</td>
<td>Query storage domains.</td>
</tr>
<tr>
<td>hosts/search</td>
<td>Query hosts.</td>
</tr>
<tr>
<td>vms/search</td>
<td>Query virtual machines.</td>
</tr>
<tr>
<td>disks/search</td>
<td>Query disks.</td>
</tr>
<tr>
<td>templates/search</td>
<td>Query templates.</td>
</tr>
<tr>
<td>vmpools/search</td>
<td>Query virtual machine pools.</td>
</tr>
<tr>
<td>events/search</td>
<td>Query events.</td>
</tr>
<tr>
<td>users/search</td>
<td>Query users.</td>
</tr>
</tbody>
</table>

4.3. SPECIAL OBJECT ELEMENTS

Special object elements define relationships to special fixed resources within the virtualization environment.

Table 4.3. Special Objects

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>templates/blank</td>
<td>The default <strong>blank</strong> virtual machine template for your virtualization environment. This template exists in every cluster as opposed to a standard template, which only exists in a single cluster.</td>
</tr>
<tr>
<td>tags/root</td>
<td>The <strong>root</strong> tag that acts as a base for tag hierarchy in your virtualization environment.</td>
</tr>
</tbody>
</table>

4.4. SUMMARY ELEMENT
The summary element shows a high level summary of the system's statistics.

### Table 4.4. Summary Elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>vms</strong></td>
<td>Total number of vms and total number of active vms.</td>
</tr>
<tr>
<td><strong>hosts</strong></td>
<td>Total number of hosts and total number of active hosts.</td>
</tr>
<tr>
<td><strong>users</strong></td>
<td>Total number of users and total number of active users.</td>
</tr>
<tr>
<td><strong>storage_domains</strong></td>
<td>Total number of storage domains and total number of active storage domains.</td>
</tr>
</tbody>
</table>

### 4.5. RESTFUL SERVICE DESCRIPTION LANGUAGE (RSDL)

RESTful Service Description Language (RSDL) provides a description of the structure and elements in the REST API in one whole XML specification. Invoke the RSDL using the following request.

```plaintext
GET /api?rsdl HTTP/1.1
Accept: application/xml
```

This produces an XML document in the following format:

```xml
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<rsdl href="/api?rsdl" rel="rsdl">
  <description>...</description>
  <version major="3" minor="1" build="0" revision="0"/>
  <schema href="/api?schema" rel="schema">
    <name>...</name>
    <description>...</description>
  </schema>
  <links>
    <link href="/api/capabilities" rel="get">
      ...
    </link>
    ...
  </links>
</rsdl>
```

### Table 4.5. RSDL Structure Elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>description</strong></td>
<td>A plain text description of the RSDL document.</td>
</tr>
<tr>
<td><strong>version</strong></td>
<td>The API version, including <strong>major</strong> release, <strong>minor</strong> release, <strong>build</strong> and <strong>revision</strong>.</td>
</tr>
<tr>
<td><strong>schema</strong></td>
<td>A link to the XML schema (XSD) file.</td>
</tr>
</tbody>
</table>
Each link element contains the following a structure:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<rsdl href="/api?rsdl" rel="rsdl">
  ...
  <links>
    <link href="/api/..." rel="...">
      <request>
        <http_method>...
        <headers>
          <header>
            <name>...
            <value>...
          </header>
          ...
        </headers>
        <body>
          <type>...
          <parameters_set>
            <parameter required="..." type="...">
              <name>...
              ...
            </parameter>
            ...
          </parameters_set>
          </body>
        </request>
        <response>
          <type>...
        </response>
      </link>
    ...
  </links>
</rsdl>
```

### Table 4.6. RSDL Link Structure Elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>link</strong></td>
<td>A URI for API requests. Includes a URI attribute (href) and a relationship type attribute (rel).</td>
</tr>
<tr>
<td><strong>request</strong></td>
<td>Defines the request properties required for the link.</td>
</tr>
<tr>
<td><strong>http_method</strong></td>
<td>The method type to access this link. Includes the standard HTTP methods for REST API access: GET, POST, PUT and DELETE.</td>
</tr>
<tr>
<td>Element</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>headers</td>
<td>Defines the headers for the HTTP request. Contains a series of header elements, which each contain a header name and value to define the header.</td>
</tr>
<tr>
<td>body</td>
<td>Defines the body for the HTTP request. Contains a resource type and a parameter_set, which contains a sets of parameter elements with attributes to define whether they are required for a request and the data type. The parameter element also includes a name element to define the Red Hat Enterprise Virtualization Manager property to modify and also a further parameter_set subset if type is set to collection.</td>
</tr>
<tr>
<td>response</td>
<td>Defines the output for the HTTP request. Contains a type element to define the resource structure to output.</td>
</tr>
</tbody>
</table>

Use the RSDL in your applications as a method to map all links and parameter requirements for controlling a Red Hat Enterprise Virtualization environment.

### 4.6. RED HAT ENTERPRISE VIRTUALIZATION WINDOWS GUEST VSS SUPPORT

The Red Hat Enterprise Virtualization Backup and Restore API provides integration with Microsoft Windows Volume Shadow Copy Service (VSS) using qemu-ga. The VSS provider registration is made in the guest level as part of the Guest Tools deployment.

**qemu-ga** provides VSS support and live snapshots attempt to quiesce whenever possible.

### 4.7. QEMU GUEST AGENT OVERVIEW

In Red Hat Enterprise Linux 6.4, the QEMU Guest Agent (QEMU GA) provided protection against the corruption of Linux guest virtual machines. Before issuing a snapshot request or creating a backup copy of the disk, the management stack (libvirt) sent a guest-fsfreeze-freeze QMP command to the QEMU GA via the virtio-serial port. This command caused the guest agent to freeze all of the guest virtual machine’s filesystems, via the FIFREEZE ioctl() kernel function. This ioctl() function is implemented by the Linux kernel in the guest virtual machine. The function flushes the filesystem cache in the guest virtual machine’s kernel, brings the filesystem into a consistent state, and denies all userspace threads write access to the filesystem.

Only after the QEMU GA reported success, libvirt would proceed with the snapshot. At its completion, libvirt sends the guest-fsfreeze-thaw QMP command to the QEMU GA over the virtio-serial port. This command tells the QEMU GA to issue a FITHAW ioctl(), which unblocks the userspace threads that were previously denied write access, and resumes normal processing. This process did not ensure that application-level data was in a consistent state when the virtual disk snapshot was taken. This was evident in cases where the fsck utility found no problems on filesystems restored from snapshots, and yet applications were not able to resume processing from the point where the snapshot was taken and userspace processes may not have written their internal buffers to files on the disk.

Red Hat Enterprise Linux 6.5 ensures that both file and application-level synchronization (flushing) are done. Guest system administrators can write and install application-specific freezing and thawing hook scripts. Before freezing the filesystems, the QEMU GA invokes the main hook script (included in the
QEMU GA package). The main hook script in turn calls individual application-specific scripts, prepared by the guest system administrators, that temporarily deactivate all guest virtual machine applications. All of these actions occur when the mode is changed to “freeze”.

Just before filesystems are frozen, the guest system administrator’s scripts cause the databases and other file system applications to flush their working buffers to the virtual disk and to stop accepting further client connections. The applications then bring their data files into a consistent state where resumption of processing, with the reactivated (or a freshly started) instance of the application (after restoring the virtual disk from backup) is possible. When all scripts are done making their respective applications inactive, and the main hook script returns, QEMU GA proceeds to freeze filesystems, and the management stack takes the snapshot. Once all this is done, and it is confirmed that the snapshot is taken, the file system will resume to serve write requests. This process is called thawing.

Thawing is freezing in reverse order. Instructed by libvirt, QEMU GA thaws the guest virtual machine’s filesystems. It then invokes individual hook scripts (via the main hook script) to resume or restart applications that had been inactivated during the freeze process.

4.8. VSS TRANSACTION FLOW

In processing a backup, the requester and the writers coordinate to do several things: to provide a stable system image from which to back up data (the shadow copied volume), to group files together on the basis of their usage, and to store information on the saved data. This must all be done with minimal interruption of the writer’s normal work flow.

A requester (in our case the Backup Vendor) queries writers for their metadata, processes this data, notifies the writers prior to the beginning of the shadow copy and of the backup operations, and then notifies the writers again after the shadow copy and backup operations end.

Here is how the QEMU VSS provider is registered in Windows OS after the Guest Tools installation:

```
C:\Users\Administrator>vssadmin list providers
vssadmin 1.1 - Volume Shadow Copy Service administrative command-line tool
(C) Copyright 2001-2005 Microsoft Corp.

Provider name: 'QEMU Guest Agent VSS Provider'
  Provider type: Software
  Provider Id: {3629d4ed-ee09-4e0e-9a5c-6d8ba2872aef}
  Version: 0.12.1
```

[3] The RFC describing Uniform Resource Locator Generic Syntax provides a Collected ABNF for URI that explains the difference between these forms.

CHAPTER 5. COMPATIBILITY LEVEL VERSIONS

Each host connected to Red Hat Enterprise Virtualization Manager contains a version of VDSM. VDSM is the agent within the virtualization infrastructure that runs on a hypervisor or host and provides local management for virtual machines, networks and storage. Red Hat Enterprise Virtualization Manager controls hypervisors and hosts using current or older versions of VDSM.

The Manager migrates virtual machines from host to host within a cluster. This means the Manager excludes certain features from a current version of VDSM until all hosts within a cluster have the same VDSM version, or more recent, installed.

The API represents this concept as a **compatibility level** for each host, corresponding to the version of VDSM installed. A **version** element contains `major` and `minor` attributes, which describe the compatibility level.

When an administrator upgrades all hosts within a cluster to a certain level, the **version** level appears under a **supported_versions** element. This indicates the cluster's **version** is now updatable to that level. Once the administrator updates all clusters within a data center to a given level, the data center is updatable to that level.

5.1. UPGRADING COMPATIBILITY LEVELS

Example 5.1. Upgrading compatibility levels

The API reports the following compatibility levels for Red Hat Enterprise Virtualization Manager 3.4 instance:

```xml
<host ...
  ...
  <version major="4" minor="14" build="11" revision="0"
  full_version="vdsm-4.14.11-5.el6ev"/>
  ...
</host>

<cluster ...
  ...
  <version major="3" minor="4"/>
  ...
</cluster>

<data_center ...
  ...
  <version major="3" minor="4"/>
  </supported_versions>
  ...
</data_center>
```

All hosts within a cluster are updated to VDSM 3.5 and the API reports:

```xml
<host ...
  ...
  <version major="4" minor="16" build="7" revision="4"
  full_version="vdsm-4.16.7.4-1.el6ev"/>
```
The cluster is now updatable to 3.5. When the cluster is updated, the API reports:

```
<cluster ...>
  ...
  <version major="3" minor="5"/>
  <supported_versions/>
  ...
</cluster>
```

The API user updates the data center to 3.5. Once upgraded, the API exposes features available in Red Hat Enterprise Virtualization 3.5 for this data center.
CHAPTER 6. CAPABILITIES

The capabilities collection provides information about the capabilities that versions of Red Hat Enterprise Virtualization support. These capabilities include active features and available enumerated values for specific properties.

To retrieve a full list of the capabilities for all versions of Red Hat Enterprise Virtualization from 3.2 to the latest version, submit the following request:

```
GET /api/capabilities/ HTTP/1.1
Content-Type: application/xml
Accept: application/xml
```

6.1. VERSION-DEPENDENT CAPABILITIES

The capabilities element contains any number of version elements that describe capabilities dependent on a compatibility level.

The version element includes attributes for major and minor version numbers. This indicates the current version level.

The following representation shows capabilities specific to Red Hat Enterprise Virtualization Manager 3.0, 3.1, 3.2, 3.3, 3.4, 3.5, and 3.6 respectively:

```
<capabilities>
  <version major="3" minor="0">
    ...
  </version>
  <version major="3" minor="1">
    ...
  </version>
  <version major="3" minor="2">
    ...
  </version>
  <version major="3" minor="3">
    ...
  </version>
  <version major="3" minor="4">
    ...
  </version>
  <version major="3" minor="5">
    ...
  </version>
  <version major="3" minor="6">
    ...
  </version>
  ...
</capabilities>
```

Each version contains a series of capabilities dependent on the version specified.

6.2. CURRENT VERSION
The `current` element signifies if the `version` specified is the most recent supported compatibility level. The value is a Boolean `true` or `false`.

```xml
<capabilities>
  <version major="3" minor="5">
    ...
    <current>true</current>
    ...
  </version>
</capabilities>
```

### 6.3. FEATURES

Each version contains a list of compatible features. The following table lists the features compatible with Red Hat Enterprise Virtualization 3.6.

**Table 6.1. Feature Types**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transparent huge pages memory policy</td>
<td>Allows you to define the availability of transparent huge pages for hosts. Acceptable values are <code>true</code> or <code>false</code>.</td>
</tr>
<tr>
<td>Gluster support</td>
<td>This feature provides support for using Gluster Volumes and Bricks as storage.</td>
</tr>
<tr>
<td>POSIX-FS storage type</td>
<td>This feature provides support for the POSIX-FS storage type.</td>
</tr>
<tr>
<td>Port mirroring</td>
<td>Allows you to define the availability of port mirroring for virtual network interface cards. Acceptable values are <code>true</code> or <code>false</code>.</td>
</tr>
<tr>
<td>Display server time</td>
<td>Displays the current date and time in the API.</td>
</tr>
<tr>
<td>Display host memory</td>
<td>Displays the total memory for a specific host.</td>
</tr>
<tr>
<td>Display host sockets</td>
<td>Allows you to define the topology of a host CPU. Takes three attributes - <code>sockets</code>, <code>threads</code> and <code>cores</code> - which define the number of host sockets displayed, the number of threads and the number of cores per socket.</td>
</tr>
<tr>
<td>Search case sensitivity</td>
<td>Allows you to specify whether a search query is case sensitive by providing the `case-sensitive=true</td>
</tr>
<tr>
<td>Maximum results for GET requests</td>
<td>Allows you to specify the maximum number of results returned from a GET request.</td>
</tr>
<tr>
<td>JSON content type</td>
<td>Allows you to define a header that makes it possible to set a correlation ID for POST and PUT requests.</td>
</tr>
<tr>
<td>Feature</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Activate and deactivate disks</td>
<td>Allows you to activate or deactivate a disk by specifying <code>activate</code> or <code>deactivate</code> as an action on a specific virtual disk.</td>
</tr>
<tr>
<td>Activate and deactivate network interface cards</td>
<td>Allows you to activate or deactivate a network interface card by specifying <code>activate</code> or <code>deactivate</code> as an action on a specific network interface card.</td>
</tr>
<tr>
<td>Snapshot refactoring</td>
<td>Allows you to refactor snapshots for virtual machines.</td>
</tr>
<tr>
<td>Remove template disks from specified storage domain</td>
<td>Allows you to remove virtual machine template disks from a specific storage domain using a DELETE request.</td>
</tr>
<tr>
<td>Floating disks</td>
<td>Floating disks are disks that are not attached to any virtual machine. With this feature, such disks also appear in the root collection rather than under specific virtual machines.</td>
</tr>
<tr>
<td>Asynchronous deletion</td>
<td>Allows you to specify that DELETE requests are to be performed asynchronously by specifying the async URL parameter.</td>
</tr>
<tr>
<td>Session-based authentication</td>
<td>Allows you to maintain a client-server session by providing an appropriate header, eliminating the need to log in with each request.</td>
</tr>
<tr>
<td>Virtual machine applications</td>
<td>Allows you to view a list of applications installed on a specific virtual machine. This list is located in the applications element of a specific virtual machine.</td>
</tr>
<tr>
<td>VirtIO-SCSI support</td>
<td>This feature provides support for para-virtualized SCSI controller devices.</td>
</tr>
<tr>
<td>Custom resource comments</td>
<td>Allows you to add custom comments to data centers and other resources.</td>
</tr>
<tr>
<td>Refresh host capabilities</td>
<td>Allows you to synchronize data on hosts and refresh the list of network interfaces available to a specific host.</td>
</tr>
<tr>
<td>Memory snapshot</td>
<td>Allows you to include the memory state as part of a virtual machine snapshot.</td>
</tr>
<tr>
<td>Watchdog device</td>
<td>Allows you to create watchdog devices for virtual machines.</td>
</tr>
<tr>
<td>SSH authentication method</td>
<td>Allows you to authenticate with hosts over SSH using an administrative user password or SSH public key.</td>
</tr>
<tr>
<td>Force select SPM</td>
<td>Allows you to force the selection of a host as SPM.</td>
</tr>
<tr>
<td>Feature</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Console device</td>
<td>Allows you to control the attachment of console devices in virtual machines.</td>
</tr>
<tr>
<td>Storage server connections for storage domains</td>
<td>Allows you to view storage server connections to or from a specific storage domain.</td>
</tr>
<tr>
<td>Attach and detach storage server connections</td>
<td>Allows you to attach or detach storage server connections to or from a specific storage domain.</td>
</tr>
<tr>
<td>Single PCI for Qxl</td>
<td>Allows you to view multiple video devices via a single PCI guest device.</td>
</tr>
<tr>
<td>Add virtual machine from OVF configuration</td>
<td>Allows you to add a virtual machine from a provided OVF configuration.</td>
</tr>
<tr>
<td>Virtual network interface card profiles</td>
<td>Allows you to configure a profile that defines quality of service, custom properties and port mirroring for a specific virtual network interface card.</td>
</tr>
<tr>
<td>Image storage domains (tech preview)</td>
<td>Allows you to import images from and export images to an image storage domain such as an OpenStack image service (Glance).</td>
</tr>
<tr>
<td>Virtual machine fully qualified domain names</td>
<td>Allows you to retrieve the fully qualified domain name of a specific virtual machine.</td>
</tr>
<tr>
<td>Attaching disk snapshots to virtual machines</td>
<td>This feature provides support for attaching disk snapshots to virtual machines.</td>
</tr>
<tr>
<td>Cloud-Init</td>
<td>Allows you to initialize a virtual machine using Cloud Init.</td>
</tr>
<tr>
<td>Gluster brick management</td>
<td>Allows you to delete gluster bricks with data migration using the actions <code>migrate</code> and <code>DELETE</code>. The <code>migrate</code> action and <code>stopmigrate</code> action allow you to migrate data and reuse the brick.</td>
</tr>
<tr>
<td>Copy and move back-end disks</td>
<td>Allows you to copy and move disks in additional contexts.</td>
</tr>
<tr>
<td>Network labels</td>
<td>Allows you to provision networks on hosts using labels.</td>
</tr>
<tr>
<td>Reboot virtual machines</td>
<td>Allows you to reboot virtual machines via a single action.</td>
</tr>
</tbody>
</table>

A full list of feature elements and their attributes is located at the top of the section for the relevant version:

```xml
<capabilities>
  <version major="3" minor="4">
```
...<features>
  <feature>
    <name>Transparent-Huge-Pages Memory Policy</name>
    <transparent_huepages/>
  </feature>
</features>
...
</version>
</capabilities>
CHAPTER 7. COMMON FEATURES

7.1. ELEMENT PROPERTY ICONS

NOTE

Throughout this guide, the elements of each resource are detailed in tables. These tables include a properties column, displaying icons depicting element properties. The meaning of these icons is shown in Table 7.1, “Element property icons.”

Table 7.1. Element property icons

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
<th>Icon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required for creation</td>
<td>These elements must be included in the client-provided representation of a resource on creation, but are not mandatory for an update of a resource.</td>
<td></td>
</tr>
<tr>
<td>Non-updatable</td>
<td>These elements cannot have their value changed when updating a resource. Include these elements in a client-provided representation on update only if their values are not altered by the API user. If altered, the API reports an error.</td>
<td></td>
</tr>
<tr>
<td>Read-only</td>
<td>These elements are read-only. Values for read-only elements are not created or modified.</td>
<td></td>
</tr>
</tbody>
</table>

7.2. REPRESENTATIONS

7.2.1. Representations

The API structures resource representations in the following XML document structure:

```xml
<resource id="resource_id" href="/api/collection/resource_id">
  <name>Resource-Name</name>
  <description>A description of the resource</description>
  ...
</resource>
```

In the context of a virtual machine, the representation appears as follows:

```xml
<vm id="5b9bbce5-0d72-4f56-b931-5d449181ee06" href="/api/vms/5b9bbce5-0d72-4f56-b931-5d449181ee06">
  <name>RHEL6-Machine</name>
  <description>Red Hat Enterprise Linux 6 Virtual Machine</description>
  ...
</vm>
```

7.2.2. Common Attributes to Resource Representations
All resource representations contain a set of common attributes

### Table 7.2. Common attributes to resource representations

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>GUID</td>
<td>Each resource in the virtualization infrastructure contains an <strong>id</strong>, which acts as a globally unique identifier (GUID). The GUID is the primary method of resource identification.</td>
</tr>
<tr>
<td>href</td>
<td>string</td>
<td>The canonical location of the resource as an absolute path.</td>
</tr>
</tbody>
</table>

### 7.2.3. Common Elements to Resource Representations

All resource representations contain a set of common elements.

### Table 7.3. Common elements to resource representations

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>string</td>
<td>A user-supplied human readable name for the resource. The <strong>name</strong> is unique across all resources of its type.</td>
</tr>
<tr>
<td>description</td>
<td>string</td>
<td>A free-form user-supplied human readable description of the resource.</td>
</tr>
</tbody>
</table>

### 7.3. COLLECTIONS

#### 7.3.1. Collections

A collection is a set of resources of the same type. The API provides both top-level collections and sub-collections. An example of a top-level collection is the **hosts** collection which contains all virtualization hosts in the environment. An example of a sub-collection is the **host.nics** collection which contains resources for all network interface cards attached to a host resource.

#### 7.3.2. Listing All Resources in a Collection

Obtain a listing of resources in a collection with a **GET** request on the collection URI obtained from the entry point.

Include an **Accept** HTTP header to define the MIME type for the response format.

```plaintext
GET /api/[collection] HTTP/1.1
Accept: [MIME type]
```

#### 7.3.3. Listing Extended Resource Sub-Collections
The API extends collection representations to include sub-collections when the `Accept` header includes the `detail` parameter.

```
GET /api/collection HTTP/1.1
Accept: application/xml; detail=subcollection
```

This includes multiple sub-collection requests using either separated `detail` parameters:

```
GET /api/collection HTTP/1.1
Accept: application/xml; detail=subcollection1; detail=subcollection2
```

Or one `detail` parameter that separates the sub-collection with the `+` operator:

```
GET /api/collection HTTP/1.1
Accept: application/xml;
detail=subcollection1+subcollection2+subcollection3
```

The API supports extended sub-collections for the following main collections.

### Table 7.4. Collections that use extended sub-collections

<table>
<thead>
<tr>
<th>Collection</th>
<th>Extended Sub-Collection Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>hosts</td>
<td>statistics</td>
</tr>
<tr>
<td>vms</td>
<td>statistics, nics, disks</td>
</tr>
</tbody>
</table>

**Example 7.1. A request for extended statistics, NICs and disks sub-collections in the vms collection**

```
GET /api/vms HTTP/1.1
Accept: application/xml; detail=statistics+nics+disks
```

### 7.3.4. Searching Collections with Queries

A `GET` request on a "collection/search" link results in a search query of that collection. The API only returns resources within the collection that satisfy the search query constraints.

```
GET /api/collection?search={query} HTTP/1.1
Accept: application/xml

HTTP/1.1 200 OK
Content-Type: application/xml

<collection>
    <resource id="resource_id" href="/api/collection/resource_id">
        ...
    </resource>
    ...
</collection>
```
7.3.5. Maximum Results Parameter

Use the max URL parameter to limit the list of results. Previous to Red Hat Enterprise Virtualization 3.4, the default size of the result was limited by the SearchResultsLimit parameter. From Red Hat Enterprise Virtualization 3.4, this parameter does not affect the REST API and an API search query without specifying the max parameter will return all values. Specifying the max parameter is recommended to prevent API search queries from slowing UI performance.

```
GET /api/collection;max=1 HTTP/1.1
Accept: application/xml

HTTP/1.1 200 OK
Content-Type: application/xml

<collection>
  <resource id="resource_id" href="/api/collection/resource_id">
    <name>Resource-Name</name>
    <description>A description of the resource</description>
    ...
  </resource>
</collection>
```

7.3.6. Case Sensitivity

All search queries are case sensitive by default. The URL syntax provides a Boolean option to toggle case sensitivity.

**Example 7.2. Case insensitive search query**

```
GET /api/collection;case-sensitive=false?search={query} HTTP/1.1
Accept: application/xml
```

7.3.7. Query Syntax

The API uses the URI templates to perform a search query with a GET request:

```
GET /api/collection?search={query} HTTP/1.1
Accept: application/xml
```

The query template value refers to the search query the API directs to the collection. This query uses the same format as Red Hat Enterprise Virtualization Query Language:

```
(criteria) [sortby (element) asc|desc]
```

The sortby clause is optional and only needed when ordering results.

**Table 7.5. Example search queries**

<table>
<thead>
<tr>
<th>Collection</th>
<th>Criteria</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collection</td>
<td>Criteria</td>
<td>Result</td>
</tr>
<tr>
<td>------------</td>
<td>----------</td>
<td>--------</td>
</tr>
<tr>
<td>hosts</td>
<td>vms.status=up</td>
<td>Displays a list of all hosts running virtual machines that are <em>up</em>.</td>
</tr>
<tr>
<td>vms</td>
<td>domain=qa.company.com</td>
<td>Displays a list of all virtual machines running on the specified domain.</td>
</tr>
<tr>
<td>vms</td>
<td>users.name=mary</td>
<td>Displays a list of all virtual machines belonging to users with the user name <em>mary</em>.</td>
</tr>
<tr>
<td>events</td>
<td>severity&gt;normal sortby time</td>
<td>Displays the list of all <em>events</em> with severity higher than <em>normal</em> and sorted by the <em>time</em> element values.</td>
</tr>
<tr>
<td>events</td>
<td>severity&gt;normal sortby time desc</td>
<td>Displays the list of all <em>events</em> with severity higher than <em>normal</em> and sorted by the <em>time</em> element values in descending order.</td>
</tr>
</tbody>
</table>

The API requires the *query* template to be URL-encoded to translate reserved characters, such as operators and spaces.

**Example 7.3. URL-encoded search query**

```
GET /api/vms?search=name%3Dvm1 HTTP/1.1
Accept: application/xml
```

### 7.3.8. Wildcards

Search queries substitute part of a value with an asterisk as a wildcard.

**Example 7.4. Wildcard search query for name=vm***

```
GET /api/vms?search=name%3Dvm* HTTP/1.1
Accept: application/xml
```

This query would result in all virtual machines with names beginning with *vm*, such as *vm1*, *vm2*, *vma* or *vm-webserver*.

**Example 7.5. Wildcard search query for name=v*1**

```
GET /api/vms?search=name%3Dv*1 HTTP/1.1
Accept: application/xml
```
This query would result in all virtual machines with names beginning with v and ending with 1, such as vm1, vr1 or virtualmachine1.

### 7.3.9. Pagination

Some Red Hat Enterprise Virtualization environments contain large collections of resources. However, the API only displays a default number of resources for one search query to a collection. To display more than the default, the API separates collections into pages via a search query containing the page command.

**Example 7.6. Paginating resources**

This example paginates resources in a collection. The URL-encoded request is:

```
GET /api/collection?search=page%201 HTTP/1.1
Accept: application/xml
```

Increase the page value to view the next page of results:

```
GET /api/collection?search=page%202 HTTP/1.1
Accept: application/xml
```

Use the page command in conjunction with other commands in a search query. For example:

```
GET /api/collection?search=sortby%20element%20asc%20page%202 HTTP/1.1
Accept: application/xml
```

This query displays the second page in a collection listing ordered by a chosen element.

---

**IMPORTANT**

The REST APIs are stateless; it is not possible to retain a state between different requests since all requests are independent from each other. As a result, if a status change occurs between your requests, then the page results may be inconsistent.

For example, if you request a specific page from a list of VMs, and a status change occurs before you can request the next page, then your results may be missing entries or contain duplicated entries.

### 7.3.10. Creating a Resource in a Collection

Create a new resource with a POST request to the collection URI containing a representation of the new resource.

A POST request requires a Content-Type header. This informs the API of the representation MIME type in the body content as part of the request.

Include an Accept HTTP header to define the MIME type for the response format.

Each resource type has its own specific required properties. The client supplies these properties when creating a new resource. Refer to the individual resource type documentation for more details.
If a required property is absent, the creation fails with a representation indicating the missing elements.

POST /api/[collection] HTTP/1.1
Accept: [MIME type]
Content-Type: [MIME type]

[body]

7.3.11. Asynchronous Requests

The API performs asynchronous POST requests unless the user overrides them with an Expect: 201-created header.

For example, certain resources, such as Virtual Machines, Disks, Snapshots and Templates, are created asynchronously. A request to create an asynchronous resource results in a 202 Accepted status. The initial document structure for a 202 Accepted resource also contains a creation_status element and link for creation status updates. For example:

POST /api/collection HTTP/1.1
Accept: application/xml
Content-Type: application/xml

<resource>
  <name>Resource-Name</name>
</resource>

HTTP/1.1 202 Accepted
Content-Type: application/xml

<resource id="resource_id" href="/api/collection/resource_id">
  <name>Resource-Name</name>
  <creation_status>
    <state>pending</state>
  </creation_status>
  <link rel="creation_status" href="/api/collection/resource_id/creation_status/creation_status_id"/>
  ...
</resource>

A GET request to the creation_status link provides a creation status update:

GET /api/collection/resource_id/creation_status/creation_status_id HTTP/1.1
Accept: application/xml

HTTP/1.1 200 OK
Content-Type: application/xml

<creation id="creation_status_id" href="/api/collection/resource_id/creation_status/creation_status_id">
  <status>
Overriding the asynchronous resource creation requires an **Expect: 201-created** header:

```
POST /api/collection HTTP/1.1
Accept: application/xml
Content-Type: application/xml
Expect: 201-created

<resource>
    <name>Resource-Name</name>
</resource>
```

### 7.4. RESOURCES

#### 7.4.1. Resources

Resources are data sources in a RESTful web service. Each resource type contains a set of common parameters that the REST API abstracts to form a **resource representation**, usually in XML or JSON. Users can view a resource representation, then edit the parameters and send the representation back to the resource’s URL within the API, which modifies the resource. Users can also delete individual resources through REST.

A RESTful web service also groups resources into **collections**. Users can view a representation of all resources in a collection. Users also send resource representations to a specific collection to create a new resource within that particular collection.

#### 7.4.2. Retrieving a Resource

Obtain the state of a resource with a **GET** request on a URI obtained from a collection listing.

Include an **Accept** HTTP header to define the MIME type for the response format.

```
GET /api/[collection]/[resource_id] HTTP/1.1
Accept: [MIME type]
```

You can obtain additional information from some resources using the **All-Content: true** header. The RESTful Service Description Language describes which links support this header.

```
GET /api/[collection]/[resource_id] HTTP/1.1
Accept: [MIME type]
All-Content: true
```

#### 7.4.3. Updating a Resource

Modify resource properties with a **PUT** request containing an updated description from a previous **GET** request for the resource URI. Details on modifiable properties are found in the individual resource type documentation.
A **PUT** request requires a **Content-Type** header. This informs the API of the representation MIME type in the body content as part of the request.

Include an **Accept** HTTP header to define the MIME type for the response format.

```plaintext
PUT /api/collection/resource_id HTTP/1.1
Accept: [MIME type]
Content-Type: [MIME type]

[body]
```

This does not include immutable resource properties that an API user has attempted to modify. If an attempt is made to modify a **strictly** immutable resource property, the API reports a conflict with an error message representation in the response body.

Properties omitted from the representation are ignored and not changed.

### 7.4.4. Deleting a Resource

Delete a resource with a **DELETE** request sent to its URI.

Include an **Accept** HTTP header to define the MIME type for the response format.

```plaintext
DELETE /api/[collection]/[resource_id] HTTP/1.1
Accept: [MIME type]
```

Some cases require optional body content in the **DELETE** request to specify additional properties. A **DELETE** request with optional body content requires a **Content-Type** header to inform the API of the representation MIME type in the body content. If a **DELETE** request contains no body content, omit the **Content-Type** header.

### 7.4.5. Sub-Collection Relationships

A sub-collection relationship defines a hierarchical link between a resource and a sub-collection. The sub-collection exists or has some meaning in the context of a parent resource. For example, a virtual machine contains network interfaces, which means the API maps the relationship between the virtual machine resource and the network interfaces sub-collection.

Sub-collections are used to model the following relationships types:

- Where one parent resource can contain several child resources and vice versa. For example, a virtual machine can contain several disks and some disks are shared among multiple virtual machines.

- Where mapped resources are dependent on a parent resource. Without the parent resource, the dependent resource cannot exist. For example, the link between a virtual machine and snapshots.

- Where mapped resources exist independently from parent resources but data is still associated with the relationship. For example, the link between a cluster and a network.

The API defines a relationship between a resource and a sub-collection using the **link rel** attribute:

```plaintext
GET /api/collection/resource_id HTTP/1.1
```
The API user now queries the sub-collection.

```
GET /api/collection/resource_id/subcollection HTTP/1.1
Accept: application/xml

HTTP/1.1 200 OK
Content-Type: application/xml

<subcollection>
  <subresource id="subresource_id"
    href="/api/collection/resource_id/subcollection/subresource_id">
    ...
  </subresource>
  ...
</subcollection>
```

### 7.4.6. XML Element Relationships

XML element links act as an alternative to sub-collections to express relationships between resources. XML element links are simply elements with a "href" attribute that points to the linked element.

XML element links are used to model simple 1:N mappings between resources without a dependency and without data associated with the relationship. For example, the relationship between a host and a cluster.

Examples of such relationships include:

- Backlinks from a resource in a sub-collection to a parent resource; or
- Links between resources with an arbitrary relationship.

**Example 7.7. Backlinking from a sub-collection resource to a resource using an XML element**

```
GET /api/collection/resource_id/subcollection/subresource_id HTTP/1.1

HTTP/1.1 200 OK
Content-Type: application/xml

<subcollection>
  <subresource id="subresource_id"
    href="/api/collection/resource_id/subcollection/subresource_id">
    <resource id="resource_id" href="/api/collection/resource_id"/>
    ...
  </subresource>
  ...
</subcollection>
```
7.4.7. Actions

Most resources include a list of action links to provide functions not achieved through the standard HTTP methods.

```
<resource>
  ...
  <actions>
    <link rel="start" href="/api/collection/resource_id/start"/>
    <link rel="stop" href="/api/collection/resource_id/stop"/>
  ...
</actions>
  ...
</resource>
```

The API invokes an action with a **POST** request to the supplied URI. The body of the **POST** requires an **action** representation encapsulating common and task-specific parameters.

### Table 7.6. Common action parameters

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>async</td>
<td><strong>true</strong> if the server responds immediately with <strong>202 Accepted</strong> and an action representation contains a <strong>href</strong> link to be polled for completion.</td>
</tr>
<tr>
<td>grace_period</td>
<td>a grace period in milliseconds, which must expire before the action is initiated.</td>
</tr>
</tbody>
</table>

Individual actions and their parameters are documented in the individual resource type's documentation. Some parameters are mandatory for specific actions and their absence is indicated with a **fault** response.

An action also requires a **Content-Type**: **application/xml** header since the **POST** request requires an XML representation in the body content.

When the action is initiated asynchronously, the immediate **202 Accepted** response provides a link to monitor the status of the task:

```
POST /api/collection/resource_id/action HTTP/1.1
Content-Type: application/xml
Accept: application/xml

?action>
  <async>true</async>
</action>
```

HTTP/1.1 202 Accepted
Content-Type: application/xml
A subsequent **GET** on the action URI provides an indication of the status of the asynchronous task.

### Table 7.7. Action statuses

<table>
<thead>
<tr>
<th>Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>pending</strong></td>
<td>Task has not yet started.</td>
</tr>
<tr>
<td><strong>in_progress</strong></td>
<td>Task is in operation.</td>
</tr>
<tr>
<td><strong>complete</strong></td>
<td>Task completed successfully.</td>
</tr>
<tr>
<td><strong>failed</strong></td>
<td>Task failed. The returned <strong>action</strong> representation would contain a <strong>fault</strong> describing the failure.</td>
</tr>
</tbody>
</table>

Once the task has completed, the action is retained for an indeterminate period. Once this has expired, subsequent **GETs** are **301 Moved Permanently** redirected back to the target resource.

```xml
<action id="action_id"
   href="/api/collection/resource_id/action/action_id"/>
   <async>true</async>

...</action>
```

An action representation also includes some links that are identified by the **rel** attribute:

### Table 7.8. Action relationships

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>parent</strong></td>
<td>A link back to the resource of this action.</td>
</tr>
<tr>
<td><strong>replay</strong></td>
<td>A link back to the original action URI. POSTing to this URI causes the action to be re-initiated.</td>
</tr>
</tbody>
</table>
7.4.8. Permissions

Each resource contains a permissions sub-collection. Each permission contains a user, an assigned role and the specified resource. For example:

GET /api/collection/resource_id/permissions HTTP/1.1
Accept: application/xml

HTTP/1.1 200 OK
Content-Type: application/xml

<permissions>
  <permission id="permission-id"
    href="/api/collection/resource_id/permissions/permission_id">
    <role id="role_id" href="/api/roles/role_id"/>
    <user id="user_id" href="/api/users/user_id"/>
    <resource id="resource_id" href="/api/collection/resource_id"/>
  </permission>
  ...
</permissions>

A resource acquires a new permission when an API user sends a POST request with a permission representation and a Content-Type: application/xml header to the resource's permissions sub-collection. Each new permission requires a role and a user:

POST /api/collection/resource_id/permissions HTTP/1.1
Content-Type: application/xml
Accept: application/xml

<permission>
  <role id="role_id"/>
  <user id="user_id"/>
</permission>

HTTP/1.1 201 Created
Content-Type: application/xml

<permission id="permission_id"
  href="/api/resources/resource_id/permissions/permission_id">
  <role id="role_id" href="/api/roles/role_id"/>
  <user id="user_id" href="/api/users/user_id"/>
  <resource id="resource_id" href="/api/collection/resource_id"/>
</permission>

7.4.9. Handling Errors

Some errors require further explanation beyond a standard HTTP status code. For example, the API reports an unsuccessful resource state update or action with a fault representation in the response entity body. The fault contains a reason and detail strings. Clients must accommodate failed requests via extracting the fault or the expected resource representation depending on the response status code. Such cases are clearly indicated in the individual resource documentation.

PUT /api/collection/resource_id HTTP/1.1
Accept: application/xml
CHAPTER 7. COMMON FEATURES

Content-Type: application/xml

<resource>
  <id>id-update-test</id>
</resource>

HTTP/1.1 409 Conflict
Content-Type: application/xml

<fault>
  <reason>Broken immutability constraint</reason>
  <detail>Attempt to set immutable field: id</detail>
</fault>
CHAPTER 8. THE BACKUP AND RESTORE API

The backup and restore API is a collection of functions that allows you to perform full or file-level backup and restoration of virtual machines. The API combines several components of Red Hat Enterprise Virtualization, such as live snapshots and the REST API, to create and work with temporary volumes that can be attached to a virtual machine containing backup software provided by an independent software provider.

For supported third-party backup vendors, consult the Red Hat Enterprise Virtualization Ecosystem at Red Hat Marketplace.

8.1. BACKING UP A VIRTUAL MACHINE

Use the backup and restore API to back up a virtual machine. This procedure assumes you have two virtual machines: the virtual machine to back up, and a virtual machine on which the software for managing the backup is installed.

Procedure 8.1. Backing Up a Virtual Machine

1. Using the REST API, create a snapshot of the virtual machine to back up:

   ```
   POST /api/vms/11111111-1111-1111-1111-111111111111/snapshots/
   HTTP/1.1
   Accept: application/xml
   Content-type: application/xml

   <snapshot>
     <description>BACKUP</description>
   </snapshot>
   ```

   **NOTE**

   When you take a snapshot of a virtual machine, a copy of the configuration data of the virtual machine as at the time the snapshot was taken is stored in the data attribute of the configuration attribute in initialization under the snapshot.

   **IMPORTANT**

   You cannot take snapshots of disks that are marked as shareable or that are based on direct LUN disks.

2. Retrieve the configuration data of the virtual machine from the data attribute under the snapshot:

   ```
   GET /api/vms/11111111-1111-1111-1111-111111111111/snapshots/11111111-1111-1111-1111-111111111111 HTTP/1.1
   Accept: application/xml
   Content-type: application/xml
   ```

3. Identify the disk ID and snapshot ID of the snapshot:
HTTP/1.1
Accept: application/xml
Content-type: application/xml

4. Attach the snapshot to the backup virtual machine and activate the disk:

POST /api/vms/2222222-2222-2222-2222-222222222222/disks/ HTTP/1.1
Accept: application/xml
Content-type: application/xml

    <disk id="11111111-1111-1111-1111-111111111111">
        <snapshot id="11111111-1111-1111-1111-111111111111"/>
        <active>true</active>
    </disk>

5. Use the backup software on the backup virtual machine to back up the data on the snapshot disk.

6. Detach the snapshot disk from the backup virtual machine:

DELETE /api/vms/2222222-2222-2222-2222-222222222222/disks/11111111-1111-1111-1111-111111111111 HTTP/1.1
Accept: application/xml
Content-type: application/xml

    <action>
        <detach>true</detach>
    </action>

7. Optionally, delete the snapshot:

DELETE /api/vms/11111111-1111-1111-1111-111111111111/snapshots/11111111-1111-1111-1111-111111111111 HTTP/1.1
Accept: application/xml
Content-type: application/xml

You have backed up the state of a virtual machine at a fixed point in time using backup software installed on a separate virtual machine.

8.2. RESTORING A VIRTUAL MACHINE

Restore a virtual machine that has been backed up using the backup and restore API. This procedure assumes you have a backup virtual machine on which the software used to manage the previous backup is installed.

Procedure 8.2. Restoring a Virtual Machine

1. Attach the disk to the backup virtual machine:

    POST /api/vms/2222222-2222-2222-2222-222222222222/disks/ HTTP/1.1
    Accept: application/xml
2. Use the backup software to restore the backup to the disk.

3. Detach the disk from the backup virtual machine:

   DELETE /api/vms/22222222-2222-2222-2222-222222222222/disks/11111111-1111-1111-1111-111111111111 HTTP/1.1
   Accept: application/xml
   Content-type: application/xml

   <action>
   <detach>true</detach>
   </action>

4. Create a new virtual machine using the configuration data of the virtual machine being restored:

   POST /api/vms/ HTTP/1.1
   Accept: application/xml
   Content-type: application/xml

   <vm>
   <cluster>
   <name>cluster_name</name>
   </cluster>
   <name>NAME</name>
   ...
   </vm>

5. Attach the disk to the new virtual machine:

   POST /api/vms/33333333-3333-3333-3333-333333333333/disks/ HTTP/1.1
   Accept: application/xml
   Content-type: application/xml

   <disk id="11111111-1111-1111-1111-111111111111">
   </disk>

You have restored a virtual machine using a backup that was created using the backup and restore API.
CHAPTER 9. DATA CENTERS

9.1. DATA CENTER ELEMENTS

The **datacenters** collection provides information about the data centers in a Red Hat Enterprise Virtualization environment. An API user accesses this information through the rel="datacenters" link obtained from the entry point URI.

The following table shows specific elements contained in a data center resource representation.

### Table 9.1. Data center elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>string</td>
<td>A plain text, human-readable name for the data center. The name is unique across all data center resources.</td>
<td>![Warning]</td>
</tr>
<tr>
<td>description</td>
<td>string</td>
<td>A plain text, human-readable description of the data center</td>
<td>![Warning]</td>
</tr>
<tr>
<td>link rel=&quot;storagedomains&quot;</td>
<td>relationship</td>
<td>A link to the sub-collection for storage domains attached to this data center.</td>
<td>![Warning]</td>
</tr>
<tr>
<td>link rel=&quot;clusters&quot;</td>
<td>relationship</td>
<td>A link to the sub-collection for clusters attached to this data center.</td>
<td>![Warning]</td>
</tr>
<tr>
<td>link rel=&quot;networks&quot;</td>
<td>relationship</td>
<td>A link to the sub-collection for networks available to this data center.</td>
<td>![Warning]</td>
</tr>
<tr>
<td>link rel=&quot;permissions&quot;</td>
<td>relationship</td>
<td>A link to the sub-collection for data center permissions.</td>
<td>![Warning]</td>
</tr>
<tr>
<td>link rel=&quot;quotas&quot;</td>
<td>relationship</td>
<td>A link to the sub-collection for quotas associated with this data center.</td>
<td>![Warning]</td>
</tr>
<tr>
<td>local</td>
<td>Boolean: true or false</td>
<td>Specifies whether the data center is a local data center, such as created in all-in-one instances.</td>
<td>![Warning]</td>
</tr>
<tr>
<td>storage_format</td>
<td>enumerated</td>
<td>Describes the storage format version for the data center. A list of enumerated values are available in capabilities.</td>
<td>![Warning]</td>
</tr>
</tbody>
</table>
### 9.2. XML REPRESENTATION OF A DATA CENTER

**Example 9.1. An XML representation of a data center**

```xml
<data_center href="/api/datacenters/00000000-0000-0000-0000-000000000000"
    id="00000000-0000-0000-0000-000000000000">  
    <name>Default</name>  
    <description>The default Data Center</description>  
    <local>false</local>  
    <storage_format>v3</storage_format>  
    <version major="3" minor="4"/>  
    <supported_versions>  
        <version major="3" minor="4"/>  
    </supported_versions>  
    <status>  
        <state>up</state>  
    </status>  
</data_center>
```

The **status** contains one of the following enumerated values: uninitialized, up, maintenance, not_operational, problematic and contend. These states are listed in data_center_states under capabilities.
9.3. JSON REPRESENTATION OF A DATA CENTER

Example 9.2. A JSON representation of a data center

```json
{
    "data_center" : [ {
        "local" : "false",
        "storage_format" : "v3",
        "version" : {
            "major" : "3",
            "minor" : "5"
        },
        "supported_versions" : {
            "version" : [ {
                "major" : "3",
                "minor" : "5"
            } ]
        },
        "status" : {
            "state" : "up"
        },
        "mac_pool": {
          "href": "/api/macpools/00000000-0000-0000-0000-000000000000",
          "id": "00000000-0000-0000-0000-000000000000"
        },
        "name" : "Default",
        "description" : "The default Data Center",
        "href" : "/api/datacenters/00000002-0002-0002-0002-000000000255",
        "id" : "00000002-0002-0002-0002-000000000255",
        "link" : [ {
            "href" : "/api/datacenters/00000002-0002-0002-0002-000000000255/storagedomains",
            "rel" : "storagedomains"
        }, {
            "href" : "/api/datacenters/00000002-0002-0002-0002-000000000255/clusters",
            "rel" : "clusters"
        }, {
            "href" : "/api/datacenters/00000002-0002-0002-0002-000000000255/networks",
            "rel" : "networks"
        }, {
            "href" : "/api/datacenters/00000002-0002-0002-0002-000000000255/permissions",
            "rel" : "permissions"
        }, {
            "href" : "/api/datacenters/00000002-0002-0002-0002-000000000255/quotas",
```
9.4. METHODS

9.4.1. Creating a New Data Center

Creation of a new data center requires the name and local elements.

Example 9.3. Creating a data center

POST /api/datacenters HTTP/1.1
Accept: application/xml
Content-type: application/xml

<data_center>
  <name>NewDatacenter</name>
  <local>false</local>
</data_center>

9.4.2. Updating a Data Center

The name, description, storage_type, version, storage_format and mac_pool elements are updatable post-creation.

Example 9.4. Updating a data center

PUT /api/datacenters/00000000-0000-0000-0000-000000000000 HTTP/1.1
Accept: application/xml
Content-type: application/xml

<data_center>
  <name>UpdatedName</name>
  <description>An updated description for the data center</description>
</data_center>

9.4.3. Removing a Data Center
Removal of a data center requires a **DELETE** request.

**Example 9.5. Removing a data center**

DELETE /api/datacenters/00000000-0000-0000-0000-000000000000 HTTP/1.1

HTTP/1.1 204 No Content

---

**9.5. SUB-COLLECTIONS**

**9.5.1. Storage Domains Sub-Collection**

**9.5.1.1. Storage Domains Sub-Collection**

Each data center contains a sub-collection for attached storage domains. An API user interacts with this sub-collection using the standard REST methods.

An attached storage domain has a similar representation to a top-level storage domain, with the exception that it has a data center specific **status** and set of actions. States for the **status** element are listed in **storage_domain_states** under **capabilities**.

**IMPORTANT**

The API as documented in this section is experimental and subject to change. It is not covered by the backwards compatibility statement.

**9.5.1.2. Attaching and Detaching a Storage Domain**

A data center is only ready for use when at least one storage domain is attached, which an API user **POSTs** to the data center's storage domains sub-collection.

When attaching a storage domain, its **id** or **name** must be supplied. An example of attaching a storage domain to a data center:

**Example 9.6. Attach a storage domain to a data center**

POST /api/datacenters/d70d5e2d-b8ad-494a-a4d2-c7a5631073c4/storagedomains HTTP/1.1
Accept: application/xml
Content-type: application/xml

<storage_domain id="fabe0451-701f-4235-8f7e-e20e458819ed"/>

HTTP/1.1 201 Created
Location: /datacenters/d70d5e2d-b8ad-494a-a4d2-c7a5631073c4/storagedomains/fabe0451-701f-4235-8f7e-e20e458819ed
Content-Type: application/xml

<storage_domain id="fabe0451-701f-4235-8f7e-e20e458819ed"
href="/api/datacenters/d70d5e2d-b8ad-494a-a4d2-c7a5631073c4/storagedomains/"
Detach a storage domain from a data center with a DELETE request. Include an optional async element for this request to be asynchronous.

**Example 9.7. Detach a storage domain from a data center**

DELETE /api/datacenters/d70d5e2d-b8ad-494a-a4d2-c7a5631073c4/storagedomains/fabe0451-701f-4235-8f7e-e20e458819ed HTTP/1.1
Accept: application/xml
Content-type: application/xml

<action>
  <async>true</async>
</action>

9.5.1.3. Actions

9.5.1.3.1. Activate Storage Domain Action

An attached storage domain requires activation on a data center before use. The activate action does not take any action specific parameters.

**Example 9.8. Action to active a storage domain on a datacenter**

POST /api/datacenters/d70d5e2d-b8ad-494a-a4d2-c7a5631073c4/storagedomains/fabe0451-701f-4235-8f7e-e20e458819ed
9.5.1.3.2. Deactivate Storage Domain Action

An attached storage domain is deactivated on a data center before removal. The deactivate action does not take any action specific parameters.

Example 9.9. Action to deactivate a storage domain on a datacenter

```
POST /api/datacenters/d70d5e2d-b8ad-494a-a4d2-c7a5631073c4/storagedomains/fabe0451-701f-4235-8f7e-e20e458819ed/deactivate HTTP/1.1
Accept: application/xml
Content-type: application/xml
<action/>
```

9.5.2. Network Sub-Collection

9.5.2.1. Networks Sub-Collection

Networks associated with a data center are represented with the networks sub-collection. The representation of a data center's network sub-collection contains the following elements:

Table 9.2. Network elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>string</td>
<td>A plain text, human readable name for the network.</td>
</tr>
<tr>
<td>description</td>
<td>string</td>
<td>A plain text, human readable description of the network.</td>
</tr>
<tr>
<td>rel=&quot;permissions&quot;</td>
<td>relationship</td>
<td>A link to the permissions sub-collection for the network.</td>
</tr>
<tr>
<td>rel=&quot;vnicprofiles&quot;</td>
<td>relationship</td>
<td>A link to the vnicprofiles sub-collection for the network.</td>
</tr>
<tr>
<td>rel=&quot;labels&quot;</td>
<td>relationship</td>
<td>A link to the labels sub-collection for the network.</td>
</tr>
<tr>
<td>Element</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>data_center_id</td>
<td>relationship</td>
<td>A reference to the data center of which the network is a member.</td>
</tr>
<tr>
<td>stp</td>
<td>Boolean: true or false</td>
<td>Specifies whether spanning tree protocol is enabled for the network.</td>
</tr>
<tr>
<td>mtu</td>
<td>integer</td>
<td>Specifies the maximum transmission unit for the network.</td>
</tr>
</tbody>
</table>
| usages       | complex     | Defines a set of usage elements for the network. Users can define networks as vm and display networks at this level.

In the REST API, you can manipulate the networks sub-collection with the standard REST methods. For example, the POST method can be used to update a network id or name

**Example 9.10. Associating a network resource with a data center**

```
POST /api/datacenters/00000000-0000-0000-0000-000000000000/networks
HTTP/1.1
Accept: application/xml
Content-Type: application/xml

<network id="da05ac09-00be-45a1-b0b5-4a6a2438665f">
    <name>ovirtmgmt</name>
</network>

HTTP/1.1 201 Created
Location: http://{host}/clusters/00000000-0000-0000-0000-000000000000/networks/00000000-0000-0000-0000-000000000000/content-Type: application/xml

<network href="/api/networks/00000000-0000-0000-0000-000000000000" id="00000000-0000-0000-0000-000000000000">
    <name>Network_001</name>
    <link href="/api/networks/00000000-0000-0000-0000-000000000000/permissions" rel="permissions"/>
    <link href="/api/networks/00000000-0000-0000-0000-000000000000/vnicprofiles" rel="vnicprofiles"/>
    <link href="/api/networks/00000000-0000-0000-0000-000000000000/labels" rel="labels"/>
    <data_center href="/api/datacenters/00000000-0000-0000-0000-000000000000" id="00000000-0000-0000-0000-000000000000"/>
    <stp>false</stp>
    <mtu>0</mtu>
</usages>
```
Update the resource with a **PUT** request. The maximum transmission unit of a network is set using a **PUT** request to specify the integer value of the `mtu` element.

**Example 9.11. Setting the network maximum transmission unit**

```
PUT /api/datacenters/00000000-0000-0000-0000-000000000000/networks/00000000-0000-0000-0000-000000000000 HTTP/1.1
Accept: application/xml
Content-Type: application/xml

<network>
  <mtu>1500</mtu>
</network>
```

An association is removed with a **DELETE** request to the appropriate element in the collection.

**Example 9.12. Removing a network association from a data center**

```
DELETE /api/datacenters/00000000-0000-0000-0000-000000000000/networks/00000000-0000-0000-0000-000000000000 HTTP/1.1
HTTP/1.1 204 No Content
```

### 9.5.3. Quotas Sub-Collection

#### 9.5.3.1. Quotas Sub-Collection

The quotas sub-collection lists restrictions that Red Hat Enterprise Virtualization Manager implements on resources. An API user views this sub-collection and its resources using the **GET** method.

**Example 9.13. An XML representation of a quota**

```
<quota href="/api/datacenters/56087282-d7a6-11e1-af44-001a4a400e0c/quotas/e13ff85a-b2ba-4f7b-8010-e0d057c03dfe" id="e13ff85a-b2ba-4f7b-8010-e0d057c03dfe">
  <name>MyQuota</name>
  <description>A quota for my Red Hat Enterprise Virtualization environment</description>
  <data_center href="/api/datacenters/56087282-d7a6-11e1-af44-001a4a400e0c" id="56087282-d7a6-11e1-af44-001a4a400e0c"/>
</quota>
```
Creation of a new quota requires the **name** and **description** elements.

### Example 9.14. Creating a quota

**POST /api/datacenters/56087282-d7a6-11e1-af44-001a4a400e0c/quotas**

HTTP/1.1

Accept: application/xml

Content-type: application/xml

```xml
<quota>
  <name>VMQuota</name>
  <description>My new quota for virtual machines</description>
</quota>
```

Removal of a quota requires a **DELETE** request.

### Example 9.15. Removing a quota

**DELETE /api/datacenters/01a45ff0-915a-11e0-8b87-5254004ac988/quotas/e13ff85a-b2ba-4f7b-8010-e0d057c03dfe HTTP/1.1**

HTTP/1.1 204 No Content

### 9.6. ACTIONS

#### 9.6.1. Force Remove Data Center Action

An API user forces the removal of a data center when encountering unresolvable problems with storage domains, such as the loss of connection to a master storage domain or a lack of available hosts when deleting storage domains. The API includes a **force** action to help with these situations.

This action removes database entries associated with a chosen data center before the API removes the data center from the Red Hat Enterprise Virtualization environment. This means the API removes the data center regardless of associated storage domains.

This action requires a **DELETE** method. The request body contains an **action** representation with the **force** parameter set to **true**. The request also requires an additional **Content-type:** application/xml header to process the XML representation in the body.

### Example 9.16. Force remove action on a data center

**DELETE /api/datacenters/00000000-0000-0000-0000-000000000000 HTTP/1.1**

Accept: application/xml

Content-type: application/xml

```xml
<action>
  <force>true</force>
</action>
```
This action:

- Deletes all database information for **data** storage domains associated the data center;
- Deletes all database information for resources, such as virtual machines and templates, on **data** storage domains associated the data center;
- Detaches **iso** and **export** storage domains from the data center; and
- Deletes the database information for the data center.

This action overrides the requirement for a data center to be empty before deletion.

**IMPORTANT**

This action only removes the database entries for resources associated with the data center. The **data** storage domains associated with the data center require manual format before reuse. Metadata for **iso** and **export** domains require manual cleaning prior to use on another data center.
CHAPTER 10. CLUSTERS

10.1. CLUSTER ELEMENTS

The clusters collection provides information about clusters in a Red Hat Enterprise Virtualization environment. An API user accesses this information through the rel="clusters" link obtained from the entry point URI.

The following table shows specific elements contained in a cluster resource representation.

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>string</td>
<td>A user-supplied, human-readable name for the cluster. The name is unique across all cluster resources.</td>
<td></td>
</tr>
<tr>
<td>description</td>
<td>string</td>
<td>A free-form, user-supplied, human-readable description of the cluster.</td>
<td></td>
</tr>
<tr>
<td>link rel=&quot;networks&quot;</td>
<td>relationship</td>
<td>A link to the sub-collection for networks associated with this cluster.</td>
<td></td>
</tr>
<tr>
<td>link rel=&quot;permissions&quot;</td>
<td>relationship</td>
<td>A link to the sub-collection for cluster permissions.</td>
<td></td>
</tr>
<tr>
<td>link rel=&quot;glustervolumes&quot;</td>
<td>relationship</td>
<td>A link to the sub-collection for Red Hat Gluster Storage volumes associated with this cluster.</td>
<td></td>
</tr>
<tr>
<td>link rel=&quot;glusterhooks&quot;</td>
<td>relationship</td>
<td>A link to the sub-collection for Red Hat Gluster Storage volume hooks associated with this cluster.</td>
<td></td>
</tr>
<tr>
<td>link rel=&quot;affinitygroups&quot;</td>
<td>relationship</td>
<td>A link to the sub-collection for virtual machine affinity groups associated with this cluster.</td>
<td></td>
</tr>
<tr>
<td>cpu id=</td>
<td>complex</td>
<td>A server CPU reference that defines the CPU type all hosts must support in the cluster.</td>
<td></td>
</tr>
<tr>
<td>data_center_id=</td>
<td>GUID</td>
<td>A reference to the data center membership of this cluster.</td>
<td></td>
</tr>
<tr>
<td>Element</td>
<td>Type</td>
<td>Description</td>
<td>Properties</td>
</tr>
<tr>
<td>---------------------------</td>
<td>---------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>memory_policy</td>
<td>complex</td>
<td>Defines the cluster’s policy on host memory utilization.</td>
<td></td>
</tr>
<tr>
<td>scheduling_policy</td>
<td>complex</td>
<td>Defines the load-balancing or power-saving modes for hosts in the cluster.</td>
<td></td>
</tr>
<tr>
<td>version_major= minor=</td>
<td>complex</td>
<td>The compatibility level of the cluster.</td>
<td></td>
</tr>
<tr>
<td>supported_versions</td>
<td>complex</td>
<td>A list of possible version levels for the cluster.</td>
<td></td>
</tr>
<tr>
<td>error_handling</td>
<td>complex/enumerated</td>
<td>Defines virtual machine handling when a host within a cluster becomes non-operational. Requires a single on_error element containing an enumerated type property listed in capabilities.</td>
<td></td>
</tr>
<tr>
<td>virt_service</td>
<td>Boolean</td>
<td>Defines whether to expose virtualization services for this cluster.</td>
<td></td>
</tr>
<tr>
<td>gluster_service</td>
<td>Boolean</td>
<td>Defines whether to expose Red Hat Gluster Storage services for this cluster.</td>
<td></td>
</tr>
<tr>
<td>threads_as_cores</td>
<td>Boolean</td>
<td>Defines whether hosts can run virtual machines with a total number of processor cores greater than the number of cores in the host.</td>
<td></td>
</tr>
<tr>
<td>tunnel_migration</td>
<td>Boolean</td>
<td>Defines whether virtual machines use a libvirt-to-libvirt tunnel during migration.</td>
<td></td>
</tr>
<tr>
<td>trusted_service</td>
<td>Boolean</td>
<td>Defines whether an OpenAttestation server is used to verify hosts.</td>
<td></td>
</tr>
<tr>
<td>ballooning_enabled</td>
<td>Boolean</td>
<td>Defines whether ballooning is enabled for the cluster.</td>
<td></td>
</tr>
<tr>
<td>ksm</td>
<td>Boolean</td>
<td>Defines whether ksm is enabled for the cluster.</td>
<td></td>
</tr>
</tbody>
</table>
NOTE
When a host's free memory drops below 20%, ballooning commands like
mom.Controllers.Balloon - INFO Ballooning guest:half1 from 1096400
to 1991580 are logged to /etc/vdsm/mom.conf. /etc/vdsm/mom.conf is the
Memory Overcommit Manager log file. An event will also be added to the event log if a
virtual machine does not respect a balloon.

10.2. MEMORY POLICY ELEMENTS
The memory_policy element contains the following elements:

Table 10.2. Memory policy elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>overcommit percent=</td>
<td>complex</td>
<td>The percentage of host memory allowed in use before no more virtual machines can start on a host. Virtual machines can use more than the available host memory due to memory sharing under KSM. Recommended values include 100 (None), 150 (Server Load) and 200 (Desktop Load).</td>
<td></td>
</tr>
<tr>
<td>transparent_hugepages</td>
<td>complex</td>
<td>Define the enabled status of Transparent Hugepages. The status is either true or false. Check capabilities feature set to ensure your version supports transparent hugepages.</td>
<td></td>
</tr>
</tbody>
</table>

10.3. SCHEDULING POLICY ELEMENTS
The scheduling_policy element contains the following elements:

Table 10.3. Scheduling policy elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>policy</td>
<td>enumerated</td>
<td>The VM scheduling mode for hosts in the cluster. A list of enumerated types are listed in capabilities.</td>
<td></td>
</tr>
</tbody>
</table>
**thresholds low= high= duration=**

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>thresholds low= high= duration=</td>
<td>complex</td>
<td>Defines CPU limits for the host. The <strong>high</strong> attribute controls the highest CPU usage percentage the host can have before being considered overloaded. The <strong>low</strong> attribute controls the lowest CPU usage percentage the host can have before being considered underutilized. The <strong>duration</strong> attribute refers to the number of seconds the host needs to be overloaded before the scheduler starts and moves the load to another host.</td>
<td>[🔒]</td>
</tr>
</tbody>
</table>

### 10.4. XML REPRESENTATION OF A CLUSTER

**Example 10.1. An XML representation of a cluster**

```xml
<cluster id="00000000-0000-0000-0000-000000000000" href="/api/clusters/00000000-0000-0000-0000-000000000000">
  <name>Default</name>
  <description>The default server cluster</description>
  <link rel="networks" href="/api/clusters/00000000-0000-0000-0000-000000000000/networks"/>
  <link rel="permissions" href="/api/clusters/00000000-0000-0000-0000-000000000000/permissions"/>
  <link rel="glustervolumes" href="/api/clusters/00000000-0000-0000-0000-000000000000/glustervolumes"/>
  <link rel="glusterhooks" href="/api/clusters/00000000-0000-0000-0000-000000000000/glusterhooks"/>
  <link rel="affinitygroups" href="/api/clusters/00000000-0000-0000-0000-000000000000/affinitygroups"/>
  <cpu id="Intel Penryn Family"/>
  <architecture>X86_64</architecture>
  <data_center id="00000000-0000-0000-0000-000000000000" href="/api/datacenters/00000000-0000-0000-0000-000000000000"/>
  <memory_policy>
    <overcommit percent="100"/>
    <transparent_hugepages>
      <enabled>false</enabled>
    </transparent_hugepages>
  </memory_policy>
  <scheduling_policies>
    <policy>evenly_distributed</policy>
    <thresholds low="10" high="75" duration="120"/>
  </scheduling_policies>
  <version minor="0" major="3"/>
</cluster>
```
10.5. JSON REPRESENTATION OF A CLUSTER

Example 10.2. A JSON representation of a cluster

```json
{
  "cluster" : [ {
    "cpu" : {
      "architecture" : "X86_64",
      "id" : "Intel Penryn Family"
    },
    "data_center" : {
      "href" : "/api/datacenters/00000002-0002-0002-0002-000000000255",
      "id" : "00000002-0002-0002-0002-000000000255"
    },
    "memory_policy" : {
      "overcommit" : {
        "percent" : "100"
      },
      "transparent_hugepages" : {
        "enabled" : "true"
      }
    },
    "scheduling_policy" : {
      "policy" : "none",
      "name" : "none",
      "href" : "/api/schedulingpolicies/b4ed2332-a7ac-4d5f-9596-99a439cb2812",
      "id" : "b4ed2332-a7ac-4d5f-9596-99a439cb2812"
    },
    "version" : {
      "major" : "3",
      "minor" : "5"
    },
    "error_handling" : {
      "on_error" : "migrate"
    }
  }
]  
```
"virt_service": "true",
"gluster_service": "false",
"threads_as_cores": "false",
"tunnel_migration": "false",
"trusted_service": "false",
"ha_reservation": "false",
"optional_reason": "false",
"ballooning_enabled": "false",
"ksm": {
    "enabled": "true"
},
"required_rng_sources": { },
"name": "Default",
"description": "The default server cluster",
"href": "/api/clusters/00000001-0001-0001-0001-0000000002fb",
"id": "00000001-0001-0001-0001-0000000002fb",
"link": [ {
    "href": "/api/clusters/00000001-0001-0001-0001-0000000002fb/networks",
    "rel": "networks"
}, {
    "href": "/api/clusters/00000001-0001-0001-0001-0000000002fb/permissions",
    "rel": "permissions"
}, {
    "href": "/api/clusters/00000001-0001-0001-0001-0000000002fb/glustervolumes",
    "rel": "glustervolumes"
}, {
    "href": "/api/clusters/00000001-0001-0001-0001-0000000002fb/glusterhooks",
    "rel": "glusterhooks"
}, {
    "href": "/api/clusters/00000001-0001-0001-0001-0000000002fb/affinitygroups",
    "rel": "affinitygroups"
}, {
    "href": "/api/clusters/00000001-0001-0001-0001-0000000002fb/cpuprofiles",
    "rel": "cpuprofiles"
} ]
]

10.6. METHODS

10.6.1. Creating a Cluster

Creation of a new cluster requires the name, cpu id= and datacenter elements. Identify the datacenter with either the id attribute or name element.

Example 10.3. Creating a cluster
POST /api/clusters HTTP/1.1
Accept: application/xml
Content-type: application/xml

<cluster>
  <name>cluster1</name>
  <cpu id="Intel Penryn Family"/>
  <data_center id="00000000-0000-0000-0000-000000000000"/>
</cluster>

10.6.2. Updating a Cluster

The name, description, cpu id= and error_handling elements are updatable post-creation.

Example 10.4. Updating a cluster

PUT /api/clusters/00000000-0000-0000-0000-000000000000 HTTP/1.1
Accept: application/xml
Content-type: application/xml

<cluster>
  <description>Cluster 1</description>
</cluster>

10.6.3. Removing a Cluster

Removal of a cluster requires a DELETE request.

Example 10.5. Removing a cluster

DELETE /api/clusters/00000000-0000-0000-0000-000000000000 HTTP/1.1
HTTP/1.1 204 No Content

10.7. SUB-COLLECTIONS

10.7.1. Networks Sub-Collection

10.7.1.1. Networks Sub-Collection

Networks associated with a cluster are represented with the networks sub-collection. Every host within a cluster connects to these associated networks.

The representation of a cluster's network sub-collection is the same as a standard network resource except for the following additional elements:

Table 10.4. Additional network elements
<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>cluster id=</td>
<td>relationship</td>
<td>A reference to the cluster of which this network is a member.</td>
<td></td>
</tr>
<tr>
<td>required</td>
<td>Boolean</td>
<td>Defines required or optional network status.</td>
<td></td>
</tr>
<tr>
<td>display</td>
<td>Boolean</td>
<td>Defines the display network status. Used for backward compatibility.</td>
<td></td>
</tr>
<tr>
<td>usages</td>
<td>complex</td>
<td>Defines a set of usage elements for the network. Users can define networks as VM and DISPLAY networks at this level.</td>
<td></td>
</tr>
</tbody>
</table>

An API user manipulates the networks sub-collection with the standard REST methods. POSTing a network id or name reference to the networks sub-collection associates the network with the cluster.

**Example 10.6. Associating a network resource with a cluster**

```plaintext
POST /api/clusters/99408929-82cf-4dc7-a532-9d998063fa95/networks
HTTP/1.1
Accept: application/xml
Content-Type: application/xml


<network id="da05ac09-00be-45a1-b0b5-4a6a2438665f">
  <name>ovirtmgmt</name>
</network>
```

HTTP/1.1 201 Created
Location: http://{host}/clusters/99408929-82cf-4dc7-a532-9d998063fa95/networks/da05ac09-00be-45a1-b0b5-4a6a2438665f
Content-Type: application/xml

```plaintext
<network id="da05ac09-00be-45a1-b0b5-4a6a2438665f"
href="/api/clusters/99408929-82cf-4dc7-a532-9d998063fa95/networks/da05ac09-00be-45a1-b0b5-4a6a2438665f">
  <name>ovirtmgmt</name>
  <status>
    <state>operational</state>
  </status>
  <description>Display Network</description>
  <cluster id="99408929-82cf-4dc7-a532-9d998063fa95"
href="/api/clusters/99408929-82cf-4dc7-a532-9d998063fa95"/>
  <data_center id="d70d5e2d-b8ad-494a-a4d2-c7a5631073c4"
href="/api/datacenters/d70d5e2d-b8ad-494a-a4d2-c7a5631073c4"/>
  <required>true</required>
  <usages>
    <usage>VM</usage>
  </usages>
</network>
```
Update the resource with a **PUT** request.

### Example 10.7. Setting the display network status

```xml
PUT /api/clusters/99408929-82cf-4dc7-a532-9d998063fa95/networks/da05ac09-00be-45a1-b0b5-4a6a2438665f HTTP/1.1
Accept: application/xml
Content-Type: application/xml

<network>
    <required>false</required>
    <usages>
        <usage>VM</usage>
        <usage>DISPLAY</usage>
    </usages>
</network>
```

The required or optional network status is set using a **PUT** request to specify the Boolean value (true or false) of the **required** element.

### Example 10.8. Setting optional network status

```xml
PUT /api/clusters/99408929-82cf-4dc7-a532-9d998063fa95/networks/da05ac09-00be-45a1-b0b5-4a6a2438665f HTTP/1.1
Accept: application/xml
Content-Type: application/xml

<network>
    <required>false</required>
</network>
```

An association is removed with a **DELETE** request to the appropriate element in the collection.

### Example 10.9. Removing a network association from a cluster

```xml
DELETE /api/clusters/99408929-82cf-4dc7-a532-9d998063fa95/networks/da05ac09-00be-45a1-b0b5-4a6a2438665f HTTP/1.1
HTTP/1.1 204 No Content
```

### 10.7.2. Storage Volumes Sub-Collection

#### 10.7.2.1. Red Hat Gluster Storage Volumes Sub-Collection

Red Hat Enterprise Virtualization provides a means for creating and managing Red Hat Gluster Storage volumes. Red Hat Gluster Storage volumes are associated with clusters and are represented with the **glustervolumes** sub-collection.
The representation of a Red Hat Gluster Storage volume resource in the `glustervolumes` sub-collection is defined using the following elements:

**Table 10.5. Gluster volume elements**

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>volume_type</code></td>
<td>enumerated</td>
<td>Defines the volume type. See the <code>capabilities</code> collection for a list of volume types.</td>
<td></td>
</tr>
<tr>
<td><code>bricks</code></td>
<td>relationship</td>
<td>The sub-collection for the Red Hat Gluster Storage bricks. When creating a new volume, the request requires a set of <code>brick</code> elements to create and manage in this cluster. Requires the <code>server_id</code> of the Red Hat Gluster Storage server and a <code>brick_dir</code> element for the brick directory.</td>
<td></td>
</tr>
<tr>
<td><code>transport_types</code></td>
<td>complex</td>
<td>Defines a set of volume <code>transport_type</code> elements. See the <code>capabilities</code> collection for a list of available transport types.</td>
<td></td>
</tr>
<tr>
<td><code>replica_count</code></td>
<td>integer</td>
<td>Defines the file replication count for a replicated volume.</td>
<td></td>
</tr>
<tr>
<td><code>stripe_count</code></td>
<td>integer</td>
<td>Defines the stripe count for a striped volume</td>
<td></td>
</tr>
<tr>
<td><code>options</code></td>
<td>complex</td>
<td>A set of additional Red Hat Gluster Storage <code>option</code> elements. Each <code>option</code> includes an option <code>name</code> and a <code>value</code>.</td>
<td></td>
</tr>
</tbody>
</table>

**Example 10.10. An XML representation of a Red Hat Gluster Storage volume**

```xml
<gluster_volume id="99408929-82cf-4dc7-a532-9d998063fa95" href="/api/clusters/99408929-82cf-4dc7-a532-9d998063fa95/glustervolume/e199f877-900a-4e30-8114-8e3177f47651">  
  <name>GlusterVolume1</name>  
  <link rel="bricks" href="/api/clusters/99408929-82cf-4dc7-a532-9d998063fa95/glustervolume/e199f877-900a-4e30-8114-8e3177f47651/bricks"/>  
  <volume_type>DISTRIBUTED_REPLICATE</volume_type>  
  <transport_types>    
    <transport_type>TCP</transport_type>  
  </transport_types>  
  <replica_count>2</replica_count>
</gluster_volume>
```
Create a Red Hat Gluster Storage volume via a **POST** request with the required **name**, **volume_type** and **bricks** to the sub-collection.

**Example 10.11. Creating a Red Hat Gluster Storage volume**

```
POST /api/clusters/99408929-82cf-4dc7-a532-9d998063fa95/glustervolumes
HTTP/1.1
Accept: application/xml
Content-Type: application/xml

<gluster_volume>
    <name>GlusterVolume1</name>
    <volume_type>DISTRIBUTED_REPLICATE</volume_type>
    <bricks>
        <brick>
            <server_id>server1</server_id>
            <brick_dir>/exp1</brick_dir>
        </brick>
    </bricks>
</gluster_volume>
```

Remove a Red Hat Gluster Storage volume with a **DELETE** request.

**Example 10.12. Removing a Red Hat Gluster Storage volume**

```
DELETE /api/clusters/99408929-82cf-4dc7-a532-9d998063fa95/glustervolumes/e199f877-900a-4e30-8114-8e3177f47651
HTTP/1.1

HTTP/1.1 204 No Content
```

**IMPORTANT**

Resources in the **glustervolumes** sub-collection cannot be updated.

### 10.7.2.2. Bricks Sub-Collection

The **glustervolumes** sub-collection contains its own **bricks** sub-collection to define individual bricks in a Red Hat Gluster Storage volume. Additional information can be retrieved for **GET** requests using the **All-Content: true** header.
The representation of a volume's **bricks** sub-collection is defined using the following elements:

### Table 10.6. Brick elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>server_id</td>
<td>string</td>
<td>A reference to the Red Hat Gluster Storage server.</td>
<td></td>
</tr>
<tr>
<td>brick_dir</td>
<td>string</td>
<td>Defines a brick directory on the Red Hat Gluster Storage server.</td>
<td></td>
</tr>
<tr>
<td>replica_count</td>
<td>integer</td>
<td>Defines the file replication count for the brick in the volume.</td>
<td></td>
</tr>
<tr>
<td>stripe_count</td>
<td>integer</td>
<td>Defines the stripe count for the brick in the volume</td>
<td></td>
</tr>
</tbody>
</table>

Create new bricks via a **POST** request with the required **server_id** and **brick_dir** to the sub-collection.

#### Example 10.13. Adding a brick

```
POST /api/clusters/99408929-82cf-4dc7-a532-9d998063fa95/glustervolumes/e199f877-900a-4e30-8114-8e3177f47651/bricks HTTP/1.1
Accept: application/xml
Content-Type: application/xml

<brick>
  <server_id>server1</server_id>
  <brick_dir>/exp1</brick_dir>
</brick>
```

Remove a brick with a **DELETE** request.

#### Example 10.14. Removing a brick

```
DELETE /api/clusters/99408929-82cf-4dc7-a532-9d998063fa95/glustervolumes/e199f877-900a-4e30-8114-8e3177f47651/bricks/0a473ebe-01d2-444d-8f58-f565a436b8eb HTTP/1.1
HTTP/1.1 204 No Content
```
10.7.2.3. Actions

10.7.2.3.1. Start Action

The **start** action makes a Gluster volume available for use.

**Example 10.15. Starting a Volume**

```
POST /api/clusters/99408929-82cf-4dc7-a532-9d998063fa95/glustervolumes/e199f877-900a-4e30-8114-8e3177f47651/start
HTTP/1.1
Accept: application/xml
Content-Type: application/xml

<action/>
```

Use an optional **force** Boolean element to force the action for a running volume. This is useful for starting disabled brick processes in a running volume.

10.7.2.3.2. Stop Action

The **stop** action deactivates a Gluster volume.

**Example 10.16. Stopping a Volume**

```
POST /api/clusters/99408929-82cf-4dc7-a532-9d998063fa95/glustervolumes/e199f877-900a-4e30-8114-8e3177f47651/stop
HTTP/1.1
Accept: application/xml
Content-Type: application/xml

<action/>
```

Use an optional **force** Boolean element to brute force the stop action.

10.7.2.3.3. Set Option Action

The **setoption** action sets a volume option.

**Example 10.17. Set an option**

```
POST /api/clusters/99408929-82cf-4dc7-a532-9d998063fa95/glustervolumes/e199f877-900a-4e30-8114-8e3177f47651/setoption
HTTP/1.1
Accept: application/xml
Content-Type: application/xml
```

10.7.2.3.4. Reset Option Action

The `resetoption` action resets a volume option.

**Example 10.18. Reset an option**

```plaintext
POST /api/clusters/99408929-82cf-4dc7-a532-9d998063fa95/glustervolumes/e199f877-900a-4e30-8114-8e3177f47651/resetoption HTTP/1.1
Accept: application/xml
Content-Type: application/xml

<action>
  <option>
    <name>cluster.min-free-disk</name>
    <value>536870912</value>
  </option>
</action>
```

10.7.2.3.5. Reset All Options Action

The `resetalloptions` action resets all volume options.

**Example 10.19. Reset all options**

```plaintext
POST /api/clusters/99408929-82cf-4dc7-a532-9d998063fa95/glustervolumes/e199f877-900a-4e30-8114-8e3177f47651/resetalloptions HTTP/1.1
Accept: application/xml
Content-Type: application/xml

<action/>
```

10.7.3. Affinity Groups Sub-Collection

10.7.3.1. Affinity Group Sub-Collection

The representation of a virtual machine affinity group resource in the `affinitygroups` sub-collection is defined using the following elements:

**Table 10.7. Affinity group elements**
<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>string</td>
<td>A plain text, human readable name for the affinity group.</td>
<td></td>
</tr>
<tr>
<td>cluster</td>
<td>relationship</td>
<td>A reference to the cluster to which the affinity group applies.</td>
<td></td>
</tr>
<tr>
<td>positive</td>
<td>Boolean: true or false</td>
<td>Specifies whether the affinity group applies positive affinity or negative affinity to virtual machines that are members of that affinity group.</td>
<td></td>
</tr>
<tr>
<td>enforcing</td>
<td>Boolean: true or false</td>
<td>Specifies whether the affinity group uses hard or soft enforcement of the affinity applied to virtual machines that are members of that affinity group.</td>
<td></td>
</tr>
</tbody>
</table>

Example 10.20. An XML representation of a virtual machine affinity group

```xml
<affinity_group href="/api/clusters/00000000-0000-0000-0000-000000000000/affinitygroups/00000000-0000-0000-0000-000000000000" id="00000000-0000-0000-0000-000000000000">
  <name>AF_GROUP_001</name>
  <cluster href="/api/clusters/00000000-0000-0000-0000-000000000000" id="00000000-0000-0000-0000-000000000000"/>
  <positive>true</positive>
  <enforcing>true</enforcing>
</affinity_group>
```

Create a virtual machine affinity group via a **POST** request with the required **name** attribute.

Example 10.21. Creating a virtual machine affinity group

```bash
POST https://XX.XX.XX.XX/api/clusters/00000000-0000-0000-0000-000000000000/affinitygroups HTTP/1.1
Accept: application/xml
Content-Type: application/xml

<affinity_group>
  <name>AF_GROUP_001</name>
  <positive>true</positive>
  <enforcing>true</enforcing>
</affinity_group>
```

Remove a virtual machine affinity group with a **DELETE** request.

Example 10.22. Removing a virtual machine affinity group
DELETE https://XX.XX.XX.XX/api/clusters/00000000-0000-0000-0000-000000000000/affinitygroups/00000000-0000-0000-0000-000000000000
HTTP/1.1

HTTP/1.1 204 No Content
CHAPTER 11. NETWORKS

11.1. NETWORK ELEMENTS

The networks collection provides information about the logical networks in a Red Hat Enterprise Virtualization environment. An API user accesses this information through the rel="networks" link obtained from the entry point URI.

The following table shows specific elements contained in a network resource representation.

Table 11.1. Network elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>link rel=&quot;vnicprofiles&quot;</td>
<td>relationship</td>
<td>A link to the sub-collection for VNIC profiles attached to this logical network.</td>
<td></td>
</tr>
<tr>
<td>link rel=&quot;labels&quot;</td>
<td>relationship</td>
<td>A link to the sub-collection for labels attached to this logical network.</td>
<td></td>
</tr>
<tr>
<td>data_center id=</td>
<td>GUID</td>
<td>A reference to the data center of which this cluster is a member.</td>
<td>REVIEW</td>
</tr>
<tr>
<td>vlan id=</td>
<td>integer</td>
<td>A VLAN tag.</td>
<td></td>
</tr>
<tr>
<td>stp</td>
<td>Boolean: true or false</td>
<td>true if Spanning Tree Protocol is enabled on this network.</td>
<td></td>
</tr>
<tr>
<td>mtu</td>
<td>integer</td>
<td>Sets the maximum transmission unit for the logical network. If omitted, the logical network uses the default value.</td>
<td></td>
</tr>
<tr>
<td>status</td>
<td>One of operational or non_operational</td>
<td>The status of the network. These states are listed in network_states under capabilities.</td>
<td>WARNING</td>
</tr>
<tr>
<td>usages</td>
<td>complex</td>
<td>Defines a set of usage elements for the network. Users can define networks as VM networks at this level.</td>
<td></td>
</tr>
</tbody>
</table>

IMPORTANT

The API as documented in this section is experimental and subject to change. It is not covered by the backwards compatibility statement.

11.2. XML REPRESENTATION OF A NETWORK RESOURCE
Example 11.1. An XML representation of a network resource

```xml
<network href="/api/networks/00000000-0000-0000-0000-000000000000"
    id="00000000-0000-0000-0000-000000000000">
    <name>ovirtmgmt</name>
    <description>Management Network</description>
    <link href="/api/networks/00000000-0000-0000-0000-000000000000/permissions"
        rel="permissions"/>
    <link href="/api/networks/00000000-0000-0000-0000-000000000000/vnicprofiles"
        rel="vnicprofiles"/>
    <link href="/api/networks/00000000-0000-0000-0000-000000000000/labels"
        rel="labels"/>
    <data_center href="/api/datacenters/00000000-0000-0000-0000-000000000000"
        id="00000000-0000-0000-0000-000000000000"/>
    <stp>false</stp>
    <mtu>0</mtu>
    <usages>
        <usage>vm</usage>
    </usages>
</network>
```

11.3. JSON REPRESENTATION OF A NETWORK RESOURCE

Example 11.2. A JSON representation of a network resource

```json
{
    "network" : [ {
        "data_center" : {
            "href" : "/api/datacenters/00000000-0002-0002-0002-000000000255",
            "id" : "00000000-0002-0002-0002-000000000255"
        },
        "stp" : "false",
        "mtu" : "0",
        "usages" : {
            "usage" : [ "vm" ]
        },
        "name" : "ovirtmgmt",
        "description" : "Management Network",
        "href" : "/api/networks/00000000-0000-0000-0000-000000000009",
        "id" : "00000000-0000-0000-0000-000000000009",
        "link" : [ {
            "href" : "/api/networks/00000000-0000-0000-0000-000000000009/permissions",
            "rel" : "permissions"
        }, {
            "href" : "/api/networks/00000000-0000-0000-0000-000000000009/vnicprofiles",
            "rel" : "vnicprofiles"
        }, {
            "href" : "/api/networks/00000000-0000-0000-0000-000000000009/labels",
            "rel" : "labels"
        }]
    }
}
```
11.4. METHODS

11.4.1. Creating a Network Resource

Creation of a new network requires the name and datacenter elements.

Example 11.3. Creating a network resource

```plaintext
POST /api/networks HTTP/1.1
Accept: application/xml
Content-type: application/xml

<network>
  <name>network 1</name>
  <data_center id="00000000-0000-0000-0000-000000000000"/>
</network>
```

11.4.2. Updating a Network Resource

The name, description, ip, vlan, stp and display elements are updatable post-creation.

Example 11.4. Updating a network resource

```plaintext
PUT /api/networks/00000000-0000-0000-0000-000000000000 HTTP/1.1
Accept: application/xml
Content-type: application/xml

<network>
  <description>Network 1</description>
</network>
```

11.4.3. Removing a Network Resource

Removal of a network requires a DELETE request.

Example 11.5. Removing a network

```
DELETE /api/networks/00000000-0000-0000-0000-000000000000 HTTP/1.1
HTTP/1.1 204 No Content
```
11.5.1. Network VNIC Profile Sub-Collection

VNIC (Virtual Network Interface Controller) profiles, also referred to as virtual machine interface profiles, are customized profiles applied to users and groups to limit network bandwidth. Each vnicprofile contains the following elements:

Table 11.2. Elements for vnic profiles

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>string</td>
<td>The unique identifier for the profile.</td>
</tr>
<tr>
<td>description</td>
<td>string</td>
<td>A plain text description of the profile.</td>
</tr>
<tr>
<td>network</td>
<td>string</td>
<td>The unique identifier of the logical network to which the profile applies.</td>
</tr>
<tr>
<td>port_mirroring</td>
<td>Boolean: true or false</td>
<td>The default is false.</td>
</tr>
</tbody>
</table>

Example 11.6. An XML representation of the network’s vnicprofile sub-collection

```xml
<vnic_profile href= "/api/vnicprofiles/f9c2f9f1-3ae2-4100-a9a5-285ebb755c0d" id="f9c2f9f1-3ae2-4100-a9a5-285ebb755c0d">
  <name>Peanuts</name>
  <description>shelled</description>
  <network href= "/api/networks/00000000-0000-0000-0000-000000000009" id="00000000-0000-0000-0000-000000000009"/>
  <port_mirroring>false</port_mirroring>
</vnic_profile>
</vnic_profiles>
```

11.5.2. Network Labels Sub-Collection

Network labels are plain text, human-readable labels that allow you to automate the association of logical networks with physical host network interfaces. Each label contains the following elements:

Table 11.3. Elements for labels

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>network</td>
<td>string</td>
<td>The href and id of the networks to which the label is attached.</td>
</tr>
</tbody>
</table>

Example 11.7. An XML representation of the network's labels sub-collection

```xml
<labels>
  <label href="/api/networks/00000000-0000-0000-0000-000000000000/labels/eth0" id="eth0">
```

CHAPTER 11. NETWORKS
11.5.3. Methods

11.5.3.1. Attach Label to Logical Network Action

You can attach labels to a logical network to automate the association of that logical network with physical host network interfaces to which the same label has been attached.

Example 11.8. Action to attach a label to a logical network

```
POST /api/networks/00000000-0000-0000-0000-000000000000/labels/ HTTP/1.1
Accept: application/xml
Content-type: application/xml

<label id="Label_001" />
```

11.5.3.2. Removing a Label From a Logical Network

Removal of a label from a logical network requires a DELETE request.

Example 11.9. Removing a label from a logical network

```
DELETE /api/networks/00000000-0000-0000-0000-000000000000/labels/[label_id] HTTP/1.1

HTTP/1.1 204 No Content
CHAPTER 12. STORAGE DOMAINS

12.1. STORAGE DOMAIN ELEMENTS

The `storagedomains` collection provides information about the storage domains in a Red Hat Enterprise Virtualization environment. An API user accesses this information through the `rel="storagedomains"` link obtained from the entry point URI.

The following table shows specific elements contained in a storage domain resource representation.

Table 12.1. Storage domain elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>link rel=&quot;permissions&quot;</td>
<td>relationship</td>
<td>A link to the sub-collection for storage domain permissions.</td>
<td></td>
</tr>
<tr>
<td>link rel=&quot;files&quot;</td>
<td>relationship</td>
<td>A link to the <code>files</code> sub-collection for this storage domain.</td>
<td></td>
</tr>
<tr>
<td>link rel=&quot;vms&quot;</td>
<td>relationship</td>
<td>A link to the <code>vms</code> sub-collection for a storage domain with <code>type</code> set to <code>export</code>.</td>
<td></td>
</tr>
<tr>
<td>link rel=&quot;templates&quot;</td>
<td>relationship</td>
<td>A link to the <code>templates</code> sub-collection for a storage domain with <code>type</code> set to <code>export</code>.</td>
<td></td>
</tr>
<tr>
<td>type</td>
<td>enumerated</td>
<td>The storage domain type. A list of enumerated values are available in <code>capabilities</code>.</td>
<td></td>
</tr>
<tr>
<td>external_status</td>
<td>complex/enum.</td>
<td>The storage domain health status as reported by external systems and plug-ins. The <code>state</code> element contains an enumerated value of <code>ok</code>, <code>info</code>, <code>warning</code>, <code>error</code>, or <code>failure</code>.</td>
<td></td>
</tr>
<tr>
<td>master</td>
<td>Boolean: true or false</td>
<td><code>true</code> if this is the master storage domain of a data center.</td>
<td></td>
</tr>
<tr>
<td>host</td>
<td>complex</td>
<td>A reference to the host on which this storage domain should be initialized. The only restriction on this host is that it should have access to the physical storage specified.</td>
<td></td>
</tr>
<tr>
<td>Element</td>
<td>Type</td>
<td>Description</td>
<td>Properties</td>
</tr>
<tr>
<td>----------------------</td>
<td>-----------------</td>
<td>------------------------------------------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>storage</td>
<td>complex</td>
<td>Describes the underlying storage of the storage domain.</td>
<td>![Warning]</td>
</tr>
<tr>
<td>available</td>
<td>integer</td>
<td>Space available in bytes.</td>
<td>![Lock]</td>
</tr>
<tr>
<td>used</td>
<td>integer</td>
<td>Space used in bytes.</td>
<td>![Lock]</td>
</tr>
<tr>
<td>committed</td>
<td>integer</td>
<td>Space committed in bytes.</td>
<td>![Lock]</td>
</tr>
<tr>
<td>storage_format</td>
<td>enumerated</td>
<td>Describes the storage format version for the storage domain. A list of</td>
<td>![Warning]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>enumerated values are available in capabilities.</td>
<td>![Lock]</td>
</tr>
<tr>
<td>wipe_after_delete</td>
<td>Boolean: true or false</td>
<td>Sets the wipe after delete option by default on the storage domain. This option can be edited after the domain is created, but doing so will not change the wipe after delete property of disks that already exist.</td>
<td>![Lock]</td>
</tr>
<tr>
<td>warning_low_space_indicator</td>
<td>integer</td>
<td>A percentage value that sets the warning low space indicator option. If the free space available on the storage domain is below this percentage, warning messages are displayed to the user and logged.</td>
<td>![Lock]</td>
</tr>
<tr>
<td>critical_space_action_blocker</td>
<td>integer</td>
<td>A value in GB that sets the critical space action blocker option. If the free space available on the storage domain is below this value, error messages are displayed to the user and logged, and any new action that consumes space, even temporarily, will be blocked.</td>
<td>![Lock]</td>
</tr>
</tbody>
</table>

**IMPORTANT**

The API as documented in this chapter is experimental and subject to change. It is not covered by the backwards compatibility statement.

12.2. XML REPRESENTATION OF A STORAGE DOMAIN
Example 12.1. An XML representation of a storage domain

```xml
<storage_domain id="fabe0451-701f-4235-8f7e-e20e458819ed"
href="/api/storagedomains/fabe0451-701f-4235-8f7e-e20e458819ed">
  <name>data0</name>
  <link rel="permissions"
href="/api/storagedomains/be24cd98-8e23-49c7-b425-1a12bd12abb0/permissions"/>
  <link rel="files"
href="/api/storagedomains/be24cd98-8e23-49c7-b425-1a12bd12abb0/files"/>
  <type>data</type>
  <master>true</master>
  <storage>
    <type>nfs</type>
    <address>172.31.0.6</address>
    <path>/exports/RHEVX/images/0</path>
  </storage>
  <available>156766306304</available>
  <used>433791696896</used>
  <committed>617401548800</committed>
  <storage_format>v1</storage_format>
  <wipe_after_delete>true</wipe_after_delete>
  <warning_low_space_indicator>10</warning_low_space_indicator>
  <critical_space_action_blocker>5</critical_space_action_blocker>
</storage_domain>
```

12.3. JSON REPRESENTATION OF A STORAGE DOMAIN

Example 12.2. A JSON representation of a storage domain

```json
{
  "storage_domain" : [ {
    "type" : "data",
    "master" : "false",
    "storage" : {
      "address" : "192.0.2.0",
      "type" : "nfs",
      "path" : "/storage/user/nfs"
    },
    "available" : 193273528320,
    "used" : 1719869184,
    "committed" : 0,
    "storage_format" : "v3",
    "name" : "NFS_01",
    "href" : "/api/storagedomains/8827b158-6d2e-442d-a7ee-c6fd4718aaba",
    "id" : "8827b158-6d2e-442d-a7ee-c6fd4718aaba",
    "link" : [ {
      "href" : "/api/storagedomains/8827b158-6d2e-442d-a7ee-c6fd4718aaba/permissions",
      "rel" : "permissions"
    }, {
      "href" : "/api/storagedomains/8827b158-6d2e-442d-a7ee-c6fd4718aaba/files"
    }] } ]
```

12.4. METHODS

12.4.1. Creating a Storage Domain

Creation of a new storage domain requires the name, type, host and storage elements. Identify the host element with the id attribute or name element.

In Red Hat Enterprise Virtualization 3.6 and later you can enable the wipe after delete option by default on the storage domain. To configure this specify <wipe_after_delete> in the POST request. This option can be edited after the domain is created, but doing so will not change the wipe after delete property of disks that already exist.

**Example 12.3. Creating a storage domain**

```xml
POST /api/storagedomains HTTP/1.1
Accept: application/xml
Content-type: application/xml

<storage_domain>
  <name>data1</name>
  <type>data</type>
  <host id="2ab5e1da-b726-4276-4274-bbf7-0a42b16a0fc3"/>
  <storage>
    <type>nfs</type>
    <address>172.31.0.6</address>
    <path>/exports/RHEVX/images/0</path>
  </storage>
</storage_domain>
```

The API user attaches the storage domain to a data center after creation.

12.4.2. Updating a Storage Domain
Only the name and wipe after delete elements are updatable post-creation. Changing the wipe after delete element will not change the wipe after delete property of disks that already exist.

Example 12.4. Updating a storage domain

```
PUT /api/storagedomains HTTP/1.1
Accept: application/xml
Content-type: application/xml

<storage_domain>
  <name>data2</name>
  ...
  <wipe_after_delete>true</wipe_after_delete>
  ...
</storage_domain>
```

12.4.3. Removing a Storage Domain

Removal of a storage domain requires a DELETE request.

Example 12.5. Removing a storage domain

```
DELETE /api/storagedomains/fabe0451-701f-4235-8f7e-e20e458819ed HTTP/1.1
HTTP/1.1 204 No Content
```

12.5. STORAGE TYPES

12.5.1. Storage Types

The storage element contains a type element, which is an enumerated value found under the capabilities collection.

The storage element also contains additional elements specific to each storage type. The next few sections examine these additional storage type elements.

12.5.2. NFS Storage

The following table contains nfs specific elements in a storage description.

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>address</td>
<td>string</td>
<td>The host name or IP address of the NFS server.</td>
<td>锁定图标</td>
</tr>
</tbody>
</table>
12.5.3. PosixFS Storage

The following table contains posixfs specific elements in a storage description.

Table 12.3. PosixFS specific elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>address</td>
<td>string</td>
<td>The host name or IP address of the PosixFS server.</td>
<td></td>
</tr>
<tr>
<td>path</td>
<td>string</td>
<td>The path of PosixFS mountable directory on the server.</td>
<td></td>
</tr>
<tr>
<td>vfs_type</td>
<td>string</td>
<td>The Linux-supported file system type of the PosixFS share.</td>
<td></td>
</tr>
<tr>
<td>mount_options</td>
<td>string</td>
<td>The options for mounting the PosixFS share.</td>
<td></td>
</tr>
</tbody>
</table>

12.5.4. iSCSI and FCP Storage

The following table contains iscsi and fcp specific elements in a storage description.

Table 12.4. iSCSI and FCP specific elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>logical_unit id=</td>
<td>complex</td>
<td>The id of the logical unit. A storage domain also accepts multiple iSCSI or FCP logical units.</td>
<td></td>
</tr>
<tr>
<td>override_luns</td>
<td>Boolean</td>
<td>Defines whether to replace all logical unit settings with new settings. Set to true to override.</td>
<td></td>
</tr>
</tbody>
</table>

The logical_unit contains a set of sub-elements.

Table 12.5. Logical unit elements
In the case of iSCSI, if a logical_unit description also contains details of the iSCSI target with the LUN in question, the target performs an automatic login when the storage domain is created.

### 12.5.5. LocalFS Storage

The localfs specific elements in a storage description are:

Table 12.6. Localfs specific elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>path</td>
<td>string</td>
<td>The path of local storage domain on the host.</td>
<td>lock</td>
</tr>
</tbody>
</table>
A localfs storage domain requires a data center with storage_type set to localfs. This data center only contains a single host cluster, and the host cluster only contains a single host.

12.6. EXPORT STORAGE DOMAINS

12.6.1. Export Storage Domains

Storage domains with type set to export contain vms and templates sub-collections, which list the import candidate VMs and templates stored on that particular storage domain.

Example 12.6. Listing the virtual machines sub-collection of an export storage domain

GET /api/storagedomains/fabe0451-701f-4235-8f7e-e20e458819ed/vms
Accept: application/xml
HTTP/1.1 200 OK
Content-Type: application/xml

<vms>
  <vm id="082c794b-771f-452f-83c9-b2b5a19c0399"
    href="/api/storagedomains/fabe0451-701f-4235-8f7e-e20e458819ed/
    vms/082c794b-771f-452f-83c9-b2b5a19c0399">
    <name>vm1</name>
    ...
  <storage_domain id="fabe0451-701f-4235-8f7e-e20e458819ed"
    href="/api/storagedomains/fabe0451-701f-4235-8f7e-
    e20e458819ed"/>
  <actions>
    <link rel="import" href="/api/storagedomains/
    fabe0451-701f-4235-8f7e-e20e458819ed/vms/
    082c794b-771f-452f-83c9-b2b5a19c0399/import"/>
  </actions>
  </vm>
</vms>

VMs and templates in these collections have a similar representation to their counterparts in the top-level VMs and templates collection, except they also contain a storage_domain reference and an import action.

The import action imports a virtual machine or a template from an export storage domain. The destination cluster and storage domain is specified with cluster and storage_domain references.

Include an optional name element to give the virtual machine or template a specific name.

Example 12.7. Action to import a virtual machine from an export storage domain

POST /api/storagedomains/fabe0451-701f-4235-8f7e-e20e458819ed/vms/
082c794b-771f-452f-83c9-b2b5a19c0399/import HTTP/1.1
Accept: application/xml
Content-type: application/xml

&action>
Example 12.8. Action to import a template from an export storage domain

POST /api/storagedomains/fabe0451-701f-4235-8f7e-e20e458819ed/templates/082c794b-771f-452f-83c9-b2b5a19c0399/import HTTP/1.1
Accept: application/xml
Content-type: application/xml

Include an optional `clone` Boolean element to import the virtual machine as a new entity.

Example 12.9. Action to import a virtual machine as a new entity

POST /api/storagedomains/fabe0451-701f-4235-8f7e-e20e458819ed/vms/082c794b-771f-452f-83c9-b2b5a19c0399/import HTTP/1.1
Accept: application/xml
Content-type: application/xml

Include an optional `disks` element to choose which disks to import using individual `disk id` elements.

Example 12.10. Selecting disks for an import action
POST /api/storagedomains/fabe0451-701f-4235-8f7e-e20e458819ed/vms/082c794b-771f-452f-83c9-b2b5a19c0399/import HTTP/1.1
Accept: application/xml
Content-type: application/xml

<action>
  <cluster>
    <name>Default</name>
  </cluster>
  <vm>
    <name>MyVM</name>
  </vm>
  ...
  <disks>
    <disk id="4825ffda-a997-4e96-ae27-5503f1851d1b"/>
  </disks>
</action>

Delete a virtual machine or template from an export storage domain with a DELETE request.

Example 12.11. Delete virtual machine from an export storage domain

DELETE /api/storagedomains/fabe0451-701f-4235-8f7e-e20e458819ed/vms/082c794b-771f-452f-83c9-b2b5a19c0399 HTTP/1.1
Accept: application/xml

HTTP/1.1 204 No Content

12.7. GLANCE IMAGE STORAGE DOMAINS

12.7.1. Glance Image Storage Domains

Storage domains with type set to Image represent instances of an OpenStack image service that has been added to the Red Hat Enterprise Virtualization environment as an external provider. These Glance image storage domains contain an images sub-collection with virtual machine images that have been exported to or can be imported from that Glance image storage domain.

Example 12.12. Listing the images sub-collection of a Glance image storage domain

GET /api/storagedomains/00000000-0000-0000-0000-000000000000/images
Accept: application/xml

HTTP/1.1 200 OK
Content-Type: application/xml

<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<images>
  <image href="/api/storagedomains/00000000-0000-0000-0000-000000000000/images/00000000-0000-0000-0000-000000000000" id="00000000-0000-0000-0000-000000000000"/>
</images>
The `import` action imports a virtual machine image from a Glance image storage domain. The destination storage domain is specified with a `storage_domain` reference, and the destination cluster with a `cluster` reference.

Include an optional `name` element to give the virtual machine or template a specific name.

**Example 12.13. Action to import a virtual machine from a Glance image storage domain**

```xml
POST /api/storagedomains/00000000-0000-0000-0000-000000000000/images/
00000000-0000-0000-0000-000000000000/import HTTP/1.1
Accept: application/xml
Content-type: application/xml

<action>
  <storage_domain>
    <name>images0</name>
  </storage_domain>
  <cluster>
    <name>images0</name>
  </cluster>
</action>
```

You can also import images as templates by specifying the `import_as_template` reference:

**Example 12.14. Action to import a virtual machine from a Glance image storage domain as a template**

```xml
POST /api/storagedomains/00000000-0000-0000-0000-000000000000/images/
00000000-0000-0000-0000-000000000000/import HTTP/1.1
Accept: application/xml
Content-type: application/xml

<action>
  <storage_domain>
    <name>images0</name>
  </storage_domain>
  <cluster>
    <name>images0</name>
  </cluster>
  <import_as_template/>
</action>
```
12.8. IMPORTING A BLOCK STORAGE DOMAIN

12.8.1. Importing a Block Storage Domain

An existing block storage domain with type set to iscsi or fcp can be imported to the engine using the REST API. The ability to import storage domains allows you to recover data in the event of a failure in the engine database, and to migrate data from one data center or environment to another.

This procedure assumes the storage domain is not attached to a data center or host in any environment. Moreover, to import and attach an existing block storage domain to a data center, the target data center must be initialized, and must have a compatibility level of 3.5 or higher.

Procedure 12.1. Importing a block storage domain

1. Discover the targets on your iSCSI storage server:

   POST /api/hosts/052a880a-53e0-4fe3-9ed5-01f939d1df66/iscsidiscover
   Accept: application/xml
   Content-Type: application/xml

   <action>
     <iscsi>
       <address>192.0.2.0</address>
       <port>3260</port>
     </iscsi>
   </action>

2. Get a list of storage domains that are candidates to be imported, using the iSCSI targets discovered in the previous step:

   POST /api/storagedomains/00000000-0000-0000-000000000000/images/00000000-0000-0000-000000000000/import HTTP/1.1
   Accept: application/xml
   Content-type: application/xml

   <action>
     <storage_domain>
       <name>images0</name>
     </storage_domain>
     <cluster>
       <name>images0</name>
     </cluster>
     <import_as_template>true</import_as_template>
   </action>
The response shows a list of storage domains not associated with a host, similar to the following:

```xml
<action>
  <iscsi>
    <address>192.0.2.0</address>
  </iscsi>
  <storage_domains>
    <storage_domain id="6ab65b16-0f03-4b93-85a7-5bc3b8d52be0">
      <name>scsi4</name>
      <type>data</type>
      <external_status>
        <state>ok</state>
      </external_status>
      <master>false</master>
      <storage>
        <type>iscsi</type>
        <volume_group id="OlKkwa-VmEM-abW7-hPiv-BGrw-sQ2E-vTdAy1"/>
      </storage>
      <available>0</available>
      <used>0</used>
      <committed>0</committed>
      <storage_format>v3</storage_format>
    </storage_domain>
  </status>
  <state>complete</state>
</action>
```

3. Import the iSCSI storage domains to the host:

```bash
POST /api/storagedomains/ HTTP/1.1
Accept: application/xml
Content-type: application/xml

<storage_domain id="6ab65b16-0f03-4b93-85a7-5bc3b8d52be0">
  <import>true</import>
  <host id="052a880a-53e0-4fe3-9ed5-01f939d1df66" />  
  <type>data</type>
  <storage>
    <type>iscsi</type>
  </storage>
</storage_domain>
```
You have now imported the block storage domain to your host.

You may now wish to attach the storage domain to the host, and find any unregistered disks. Attach the storage domain and associated disks with the following steps:

### Procedure 12.2. Attaching a block storage domain

1. Attach the storage domain to your data center:

   ```
   POST /api/datacenters/01a45ff0-915a-45e0-8d56-5253234ac988/storagedomains
   Accept: application/xml
   Content-Type: application/xml

   <storage_domain>
     <name>scsi4</name>
   </storage_domain>
   ```

2. Find the unregistered disks on the storage domain:

   ```
   GET /api/storagedomains/6ab65b16-0f03-4b93-85a7-5bc3b8d52be0/disks;unregistered
   Accept: application/xml
   Content-Type: application/xml
   ```

   This will return information about any unregistered disks on the storage domain, with a response similar to:

   ```
   <disk href="/api/storagedomains/6ab65b16-0f03-4b93-85a7-5bc3b8d52be0/disks/b662f6da-3e97-4bb6-8a50-bda9980a6e83" id="b662f6da-3e97-4bb6-8a50-bda9980a6e83">
     <actions>
       <link href="/api/storagedomains/6ab65b16-0f03-4b93-85a7-5bc3b8d52be0/disks/b662f6da-3e97-4bb6-8a50-bda9980a6e83/export" rel="export"/>
     </actions>
     <name>disk1</name>
     <description/>
     <link href="/api/storagedomains/6ab65b16-0f03-4b93-85a7-5bc3b8d52be0/disks/b662f6da-3e97-4bb6-8a50-bda9980a6e83/permissions" rel="permissions"/>
     <link href="/api/storagedomains/6ab65b16-0f03-4b93-85a7-5bc3b8d52be0/disks/b662f6da-3e97-4bb6-8a50-bda9980a6e83/statistics" rel="statistics"/>
     <alias>disk1</alias>
     <image_id>930d653e-2a11-45ce-8042-9935584a3f87</image_id>
     <storage_domain href="/api/storagedomains/6ab65b16-0f03-4b93-85a7-5bc3b8d52be0" id="8ac10e5-7cc9-4b1c-9c97-f121a9e4679a"/>
   </storage_domain>
   ```
3. Attach the disk to the storage domain:

```xml
POST /api/storagedomains/6ab65b16-0f03-4b93-85a7-5bc3b8d52be0/disks;unregistered
Accept: application/xml
Content-Type: application/xml

<disk id='b662f6da-3e97-4bb6-8a50-bda9980a6e83'></disk>
```

The disk is now attached to the imported block storage domain.

### 12.9. SUB-COLLECTIONS

#### 12.9.1. Files Sub-Collection

The **files** sub-collection under each storage domain provides a way for clients to list available files. This sub-collection is specifically targeted to ISO storage domains, which contain ISO images and virtual floppy disks (VFDs) that an administrator uploads through Red Hat Enterprise Virtualization Manager.

The addition of a CD-ROM device to a VM requires an ISO image from the **files** sub-collection of an ISO storage domain.

**Example 12.15. Listing the files sub-collection of an ISO storage domain**

```xml
GET /api/storagedomains/00f0d9ce-da15-4b9e-9e3e-3c898fa8b6da/files
HTTP/1.1
Accept: application/xml

HTTP/1.1 200 OK
Content-Type: application/xml

<files>
  <file id="en_winxp_pro_with_sp2.iso" href="/api/storagedomains/00f0d9ce-da15-4b9e-9e3e-3c898fa8b6da/files/en_winxp_pro_with_sp2.iso">
    <name>en_winxp_pro_with_sp2.iso</name>
    <type>iso</type>
    <storage_domain id="00f0d9ce-da15-4b9e-9e3e-3c898fa8b6da" href="/api/storagedomains/00f0d9ce-da15-4b9e-9e3e-3c898fa8b6da"/>
  </file>
</files>
```
Like other resources, files have opaque id and href attributes. The name element contains the filename.

12.10. ACTIONS

12.10.1. Importing an Existing Storage Domain

The API provides a user with the ability to remove an ISO or Export storage domain from one Red Hat Enterprise Virtualization Manager instance without re-formatting the underlying storage and import it into another instance. Importing is achieved similarly to adding a new storage domain, except the name is not specified.

Example 12.16. Importing an existing export storage domain

POST /api/storagedomains HTTP/1.1
Accept: application/xml
Content-Type: application/xml

<storage_domain>
    <type>export</type>
    <storage>
        <type>nfs</type>
        <address>172.31.0.6</address>
        <path>/exports/RHEVX/export-domain</path>
    </storage>
    <host id="2ab5e1da-b726-4276-4274-bbf7-0a42b16a0fc3"/>
</storage_domain>

HTTP/1.1 201 Created
Content-Type: application/xml

<storage_domain id="fabe0451-701f-4235-8f7e-e20e458819ed"
    href="/api/storagedomains/fabe0451-701f-4235-8f7e-e20e458819ed">
    <name>export1</name>
    ...
</storage_domain>

12.10.2. Deleting a Storage Domain
A `storage_domain` reference is passed in the body of a `DELETE` request for a storage domain. The `storage_domain` reference is in the following form:

```xml
<storage_domain>
    <host id="..."/>
</storage_domain>
```

OR

```xml
<storage_domain>
    <host>
        <name>...</name>
    </host>
</storage_domain>
```

**Format Storage Domain**

An API user provides an optional `format` element to specify whether or not to format the storage domain after deletion.

**Example 12.17. Formatting a storage domain after deletion**

```xml
<storage_domain>
    <host id="..."/>
    <format>true</format>
</storage_domain>
```

If no `format` element is passed, the storage domain remains unformatted.

**Logical Removal of Storage Domain**

The API also provides a function for the logical removal of the storage domain. This retains the storage domain's data for import. Use the `destroy` element to logically remove the storage domain and retain the data.

**Example 12.18. Logical removal of a storage domain**

```xml
<storage_domain>
    <host id="..."/>
    <destroy>true</destroy>
</storage_domain>
```

**12.10.3. Refreshing the LUN Size**

Users can refresh the LUN size after increasing the size of the underlying LUN on the storage server. The `refreshluns` action forces a rescan of the provided LUNs and updates the database with the new size if required.

**Example 12.19. Refreshing the LUN Size**

```bash
POST /api/storagedomains/262b056b-aede-40f1-9666-
```
<action>
  <logical_units>
    <logical_unit id="1IET_00010001"/>
    <logical_unit id="1IET_00010002"/>
  </logical_units>
</action>
CHAPTER 13. STORAGE CONNECTIONS

13.1. STORAGE CONNECTION ELEMENTS

Table 13.1. Storage Connection Base Elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>type</td>
<td>One of nfs, posixfs, local, or iscsi</td>
<td>The type of storage domain.</td>
<td><img src="image" alt="Unlock" /></td>
</tr>
<tr>
<td>address</td>
<td>string</td>
<td>The hostname or IP address of the storage domain.</td>
<td>(Only required for NFS and iSCSI)</td>
</tr>
<tr>
<td>host</td>
<td>string</td>
<td>The id or name of the hypervisor. The host is optional. Providing it will attempt a connection to the storage via the host; not providing it will lead to persisting storage details in the database.</td>
<td><img src="image" alt="Unlock" /></td>
</tr>
</tbody>
</table>

Table 13.2. Storage Connection File-based Storage Elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>path</td>
<td>string</td>
<td>The mounted file path of the storage domain. The path cannot be updated to one already used by a storage connection.</td>
<td><img src="image" alt="Unlock" /></td>
</tr>
<tr>
<td>mount_options</td>
<td>string</td>
<td>The options for mounting the PosixFS share.</td>
<td><img src="image" alt="Unlock" /></td>
</tr>
<tr>
<td>vfs_type</td>
<td>string</td>
<td>The Linux-supported file system type of the PosixFS share.</td>
<td><img src="image" alt="Unlock" /></td>
</tr>
<tr>
<td>nfs_version</td>
<td>string</td>
<td>The version of NFS used.</td>
<td></td>
</tr>
<tr>
<td>nfs_timeo</td>
<td>integer</td>
<td>The amount of time, in deciseconds, the NFS client will wait for a request to complete.</td>
<td></td>
</tr>
</tbody>
</table>
### Element List

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>nfs_retrans</code></td>
<td>integer</td>
<td>The number of retransmissions the NFS client will attempt to complete a request.</td>
<td></td>
</tr>
</tbody>
</table>

#### Table 13.3. Storage Connection iSCSI elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>port</td>
<td>integer</td>
<td>The TCP port used for the iSCSI storage domain.</td>
<td></td>
</tr>
<tr>
<td>target</td>
<td>string</td>
<td>The target IQN for the storage device.</td>
<td></td>
</tr>
<tr>
<td>username</td>
<td>string</td>
<td>A CHAP user name for logging into a target.</td>
<td></td>
</tr>
<tr>
<td>password</td>
<td>string</td>
<td>A CHAP password for logging into a target.</td>
<td></td>
</tr>
</tbody>
</table>

### 13.2. XML REPRESENTATION OF A STORAGE CONNECTION RESOURCE

#### Example 13.1. An XML representation of a storage connection resource

```xml
<storage_connections>
  <storage_connection href= "/api/storageconnections/608c5b96-9939-4331-96b5-197f28aa2e35" id="608c5b96-9939-4331-96b5-197f28aa2e35">
    <address>domain.example.com</address>
    <type>nfs</type>
    <path>/var/lib/exports/iso</path>
  </storage_connection>
  <storage_connection href= "/api/storageconnections/2ebb3f78-8c22-4666-8df4-e4bb7fec6b3a" id="2ebb3f78-8c22-4666-8df4-e4bb7fec6b3a">
    <address>domain.example.com</address>
    <type>posixfs</type>
    <path>/export/storagedata/username/data</path>
    <vfs_type>nfs</vfs_type>
  </storage_connection>
</storage_connections>
```

### 13.3. METHODS

#### 13.3.1. Creating a New Storage Connection
Creating a new storage connection requires a POST request.

It is possible to create a new storage connection without adding a storage domain. The host id or name is optional; providing it will attempt a connection to the storage via the host.

**Example 13.2. Creating a New Storage Connection**

```xml
POST /api/storageconnections HTTP/1.1
Accept: application/xml
Content-type: application/xml

<storage_connection>
  <type>nfs</type>
  <address>domain.example.com</address>
  <path>/export/storagedata/username/data</path>
  <host>
    <name>Host_Name</name>
  </host>
</storage_connection>
```

13.3.2. Deleting a Storage Connection

Deleting a storage connection requires a DELETE request. A storage connection can only be deleted if neither storage domain nor LUN disks reference it.

The host name or id is optional; providing it unmounts the connection from that host.

**Example 13.3. Deleting Storage Connection**

```xml
DELETE /api/storageconnections/Storage_Connection_ID HTTP/1.1
Accept: application/xml
Content-type: application/xml

<host>
  <name>Host_Name</name>
</host>
```

13.3.3. Updating a Storage Connection

Updating an existing storage connection requires a PUT request. The storage domain must be in either maintenance mode or unattached to successfully update the connection.

Providing the host name or id is optional; if provided, the host attempts a connection to the updated storage details.

**Example 13.4. Updating a Storage Connection**

```xml
PUT /api/storageconnections/Storage_Connection_ID HTTP/1.1
Accept: application/xml
Content-type: application/xml
```
13.3.4. Updating an iSCSI Storage Connection

Updating an existing iSCSI storage connection requires a **PUT** request. An iSCSI storage domain must be in maintenance mode or unattached to successfully update the connection.

**Example 13.5. Updating a Storage Connection**

```plaintext
PUT /api/storageconnections/Storage_Connection_ID HTTP/1.1
Accept: application/xml
Content-type: application/xml

<storage_connection>
  <port>3456</port>
</storage_connection>
```

13.3.5. Adding New Storage Domain with Existing Storage Connection

Adding a new storage domain with existing storage connection requires a **POST** request. This is only applicable with file-based storage domains: **NFS**, **POSIX**, and **local**.

**Example 13.6. Adding a New Storage Domain with Existing Storage Connection**

```plaintext
POST /api/storagedomains HTTP/1.1
Accept: application/xml
Content-type: application/xml

<storage_domain>
  <name>New_Domain</name>
  <type>data</type>
  <storage id="Storage_Connection_ID"/>
  <host>
    <name>Host_Name</name>
  </host>
</storage_domain>
```

13.3.6. Attaching an Additional Storage Connection to iSCSI Storage

Attaching an additional storage connection to an iSCSI storage domain requires a **POST** request.

**Example 13.7. Attaching an Additional Storage Connection to iSCSI Storage**

```plaintext
POST /api/storagedomains/iSCSI_Domain_ID/storageconnections HTTP/1.1
```
13.3.7. Detaching a Storage Connection from iSCSI Storage

Detaching a storage connection from an iSCSI storage domain requires a DELETE request.

Example 13.8. Detaching a Storage Connection from iSCSI Storage

```
DELETE /api/storagedomains/iSCSI_Domain_ID/storageconnections/Storage_Connection_ID HTTP/1.1
Accept: application/xml
Content-type: application/xml
```

13.3.8. Defining Credentials to an iSCSI Target

When an iSCSI storage domain is added using the Administration Portal, only a single user name and password can be specified for that domain. However, some setups require that each host in the cluster use a separate user name and password. Specific credentials can be applied to each iSCSI target per host by using the `storageconnectionextensions` element.

Example 13.9. Defining credentials to an iSCSI target

```
POST /api/hosts/2ab5e1da-b726-4274-bbf7-0a42b16a0fc3/storageconnectionextensions HTTP/1.1
Accept: application/xml
Content-type: application/xml

<storageconnectionextension>
    <target>iqn.2010.05.com.example:iscsi.targetX</target>
    <username>jimmy</username>
    <password>p@55w0Rd!</password>
</storageconnectionextension>
```
CHAPTER 14. HOSTS

14.1. HOST ELEMENTS

The hosts collection provides information about the hosts in a Red Hat Enterprise Virtualization environment. An API user accesses this information through the rel="hosts" link obtained from the entry point URI.

Additional information can be retrieved for GET requests using the All-Content: true header.

The following table shows specific elements contained in a host resource representation.

Table 14.1. Host elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>link rel=&quot;storage&quot;</td>
<td>relationship</td>
<td>A link to the storage sub-collection for host storage.</td>
<td></td>
</tr>
<tr>
<td>link rel=&quot;nics&quot;</td>
<td>relationship</td>
<td>A link to the nics sub-collection for host network interfaces.</td>
<td></td>
</tr>
<tr>
<td>link rel=&quot;numanodes&quot;</td>
<td>relationship</td>
<td>A link to the numanodes sub-collection for host NUMA nodes.</td>
<td></td>
</tr>
<tr>
<td>link rel=&quot;tags&quot;</td>
<td>relationship</td>
<td>A link to the tags sub-collection for host tags.</td>
<td></td>
</tr>
<tr>
<td>link rel=&quot;permissions&quot;</td>
<td>relationship</td>
<td>A link to the permissions sub-collection for host permissions.</td>
<td></td>
</tr>
<tr>
<td>link rel=&quot;statistics&quot;</td>
<td>relationship</td>
<td>A link to the statistics sub-collection for host statistics.</td>
<td></td>
</tr>
<tr>
<td>link rel=&quot;hooks&quot;</td>
<td>relationship</td>
<td>A link to the hooks sub-collection for host hooks.</td>
<td></td>
</tr>
<tr>
<td>link rel=&quot;fenceagents&quot;</td>
<td>relationship</td>
<td>A link to the fenceagents sub-collection for host fence agents.</td>
<td></td>
</tr>
<tr>
<td>link rel=&quot;katelloerrata&quot;</td>
<td>relationship</td>
<td>A link to the katelloerrata sub-collection for host errata.</td>
<td></td>
</tr>
<tr>
<td>link rel=&quot;devices&quot;</td>
<td>relationship</td>
<td>A link to the devices sub-collection for host devices.</td>
<td></td>
</tr>
<tr>
<td>Element</td>
<td>Type</td>
<td>Description</td>
<td>Properties</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>link rel=&quot;networkattachments&quot;</td>
<td>relationship</td>
<td>A link to the networkattachments sub-collection for host network configuration.</td>
<td></td>
</tr>
<tr>
<td>link rel=&quot;unmanagednetworks&quot;</td>
<td>relationship</td>
<td>A link to the unmanagednetworks sub-collection for unmanaged networks on the host.</td>
<td></td>
</tr>
<tr>
<td>link rel=&quot;storageconnectionextensions&quot;</td>
<td>relationship</td>
<td>A link to the storageconnectionextensions sub-collection for host storage connection extensions.</td>
<td></td>
</tr>
<tr>
<td>name</td>
<td>string</td>
<td>The unique identifier for the host.</td>
<td></td>
</tr>
<tr>
<td>root_password</td>
<td>string</td>
<td>The root password of this host, by convention only included in the client-provided host representation on creation.</td>
<td></td>
</tr>
<tr>
<td>comment</td>
<td>string</td>
<td>Any comments regarding the host.</td>
<td></td>
</tr>
<tr>
<td>address</td>
<td>string</td>
<td>The IP address or hostname of the host.</td>
<td></td>
</tr>
<tr>
<td>certificate</td>
<td>complex</td>
<td>A reference to the host certificate details, including organization and subject.</td>
<td></td>
</tr>
<tr>
<td>status</td>
<td>See below</td>
<td>The host status.</td>
<td></td>
</tr>
<tr>
<td>external_status</td>
<td>complex/numerated</td>
<td>The host health status as reported by external systems and plug-ins. The state element contains an enumerated value of ok, info, warning, error, or failure.</td>
<td></td>
</tr>
<tr>
<td>cluster id=</td>
<td>GUID</td>
<td>A reference to the cluster that includes this host.</td>
<td></td>
</tr>
<tr>
<td>port</td>
<td>integer</td>
<td>The listen port of the VDSM daemon running on this host.</td>
<td></td>
</tr>
<tr>
<td>Element</td>
<td>Type</td>
<td>Description</td>
<td>Properties</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>type</td>
<td>One of <code>rhel</code> or <code>rhev-h</code></td>
<td>The host type.</td>
<td></td>
</tr>
<tr>
<td>storage_manager priority=</td>
<td>Boolean: true or false</td>
<td>Specifies whether the host is a storage manager.</td>
<td></td>
</tr>
<tr>
<td>version major=</td>
<td>complex</td>
<td>The compatibility level of the host.</td>
<td></td>
</tr>
<tr>
<td>minor=</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>build=</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>revision=</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>full_version=</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>hardware_information</td>
<td>complex</td>
<td>Information regarding the hardware of the host, including <code>manufacturer</code>, <code>version</code>, <code>serial_number</code>, <code>product_name</code>, <code>uuid</code>, and <code>family</code>.</td>
<td></td>
</tr>
<tr>
<td>ksm</td>
<td>Boolean: true or false</td>
<td><code>true</code> if Kernel SamePage Merging (KSM) is enabled.</td>
<td></td>
</tr>
<tr>
<td>transparent_huge_pages</td>
<td>Boolean: true or false</td>
<td><code>true</code> if Transparent Hugepages is enabled.</td>
<td></td>
</tr>
<tr>
<td>iscsi</td>
<td>complex</td>
<td>The SCSI <code>initiator</code> for the host.</td>
<td></td>
</tr>
<tr>
<td>ssh</td>
<td>complex</td>
<td>Details regarding the SSH connection with the host, including <code>port</code> and <code>fingerprint</code>.</td>
<td></td>
</tr>
<tr>
<td>Element</td>
<td>Type</td>
<td>Description</td>
<td>Properties</td>
</tr>
<tr>
<td>-----------------</td>
<td>---------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>cpu</td>
<td>complex</td>
<td>Statistics for the host CPU. Includes sub-elements for the CPU's name, topology cores=, topology sockets=, topology threads= and speed. The topology cores= aggregates the total cores while the topology sockets= aggregates the total physical CPUs. The total cores available to virtual machines equals the number of sockets multiplied by the cores per socket.</td>
<td></td>
</tr>
<tr>
<td>memory</td>
<td>integer</td>
<td>The total amount of host memory in bytes.</td>
<td></td>
</tr>
<tr>
<td>max_scheduling_memory</td>
<td>integer</td>
<td>The maximum amount of memory that can be used in scheduling in bytes.</td>
<td></td>
</tr>
<tr>
<td>summary</td>
<td>complex</td>
<td>Summary statistics of the virtual machines on the host. Includes sub-elements for numbers of active, migrating and total VMs.</td>
<td></td>
</tr>
<tr>
<td>os type=</td>
<td>complex</td>
<td>Details regarding the operating system installed on the host, including version full_version=.</td>
<td></td>
</tr>
<tr>
<td>libvirt_version</td>
<td>complex</td>
<td>The libvirt compatibility level of the host.</td>
<td></td>
</tr>
</tbody>
</table>

The status contains one of the following enumerative values: down, error, initializing, installing, install_failed, maintenance, non_operational, non_responsive, pending_approval, preparing_for_maintenance, connecting, reboot, unassigned and up. These states are listed in host_states under capabilities.

### 14.2. XML REPRESENTATION OF A HOST

**Example 14.1. An XML representation of a host**

```xml
<host href="/api/hosts/00000000-0000-0000-0000-000000000000" id="00000000-0000-0000-0000-000000000000">
    <actions>
        <link href="/api/hosts/00000000-0000-0000-0000-000000000000/upgrade" rel="upgrade"/>
        <link href="/api/hosts/00000000-0000-0000-0000-000000000000/setupnetworks" rel="setupnetworks"/>
    </actions>
```

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<link href="/api/hosts/00000000-0000-0000-0000-000000000000/fence" rel="fence"/>
<link href="/api/hosts/00000000-0000-0000-0000-000000000000/refresh" rel="refresh"/>
<link href="/api/hosts/00000000-0000-0000-0000-000000000000/install" rel="install"/>
<link href="/api/hosts/00000000-0000-0000-0000-000000000000/activate" rel="activate"/>
<link href="/api/hosts/00000000-0000-0000-0000-000000000000/deactivate" rel="deactivate"/>
<link href="/api/hosts/00000000-0000-0000-0000-000000000000/approve" rel="approve"/>
<link href="/api/hosts/00000000-0000-0000-0000-000000000000/forceselectspm" rel="forceselectspm"/>
<link href="/api/hosts/00000000-0000-0000-0000-000000000000/enrollcertificate" rel="enrollcertificate"/>
<link href="/api/hosts/00000000-0000-0000-0000-000000000000/iscsilogin" rel="iscsilogin"/>
<link href="/api/hosts/00000000-0000-0000-0000-000000000000/unregisteredstoragedomainsdiscover" rel="unregisteredstoragedomainsdiscover"/>
<link href="/api/hosts/00000000-0000-0000-0000-000000000000/iscsidiscover" rel="iscsidiscover"/>
<link href="/api/hosts/00000000-0000-0000-0000-000000000000/commitnetconfig" rel="commitnetconfig"/>

</actions>

<name>host1</name>

<link href="/api/hosts/00000000-0000-0000-0000-000000000000/storage" rel="storage"/>
<link href="/api/hosts/00000000-0000-0000-0000-000000000000/nics" rel="nics"/>
<link href="/api/hosts/00000000-0000-0000-0000-000000000000/numanodes" rel="numanodes"/>
<link href="/api/hosts/00000000-0000-0000-0000-000000000000/tags" rel="tags"/>
<link href="/api/hosts/00000000-0000-0000-0000-000000000000/permissions" rel="permissions"/>
<link href="/api/hosts/00000000-0000-0000-0000-000000000000/statistics" rel="statistics"/>
<link href="/api/hosts/00000000-0000-0000-0000-000000000000/hooks" rel="hooks"/>
<link href="/api/hosts/00000000-0000-0000-0000-000000000000/fenceagents" rel="fenceagents"/>
<link href="/api/hosts/00000000-0000-0000-0000-000000000000/katelloerrata" rel="katelloerrata"/>
<link href="/api/hosts/00000000-0000-0000-0000-000000000000/devices" rel="devices"/>
<link href="/api/hosts/00000000-0000-0000-0000-000000000000/networkattachments" rel="networkattachments"/>
<link href="/api/hosts/00000000-0000-0000-0000-000000000000/unmanagednetworks" rel="unmanagednetworks"/>
<link href="/api/hosts/00000000-0000-0000-0000-000000000000/storageconnectionextensions" rel="storageconnectionextensions"/>

<address>host1.example.com</address>

<certificate>
CHAPTER 14. HOSTS
14.3. JSON REPRESENTATION OF A HOST

Example 14.2. A JSON representation of a host

```json
{
  "host" : [ {
    "address" : "198.51.100.0",
    "certificate" : { 
      "organization" : "example.com",
      "subject" : "O=example.com,CN=192.0.2.0"
    },
    "status" : {
      "state" : "up"
    },
    "cluster" : {
      "href" : "/api/clusters/00000001-0001-0001-0001-0000000002fb",
      "id" : "00000001-0001-0001-0001-0000000002fb"
    },
    "port" : "54321",
    "type" : "rhel",
    "storage_manager" : { 
      "value" : "true",
      "priority" : "5"
    },
    "spm" : { 
      "priority" : "5"
    },
    "version" : {
      "major" : "4",
      "minor" : "16",
      "build" : "8",
      "revision" : "1",
      "full_version" : "vdsm-4.16.8.1-6.el6ev"
    },
    "hardware_information" : {

```
"manufacturer" : "System Manufacturer To Be Filled By O.E.M.",
"version" : "System Version To Be Filled By O.E.M.",
"serial_number" : "Serial Number To Be Filled By O.E.M.",
"product_name" : "Product Name To Be Filled By O.E.M.",
"uuid" : "9fa0a1a2-a3a4-a5a6-a7a8-a9aaabacadae",
"family" : "Family To Be Filled By O.E.M.",
"supported_rng_sources" : {
"source" : [ "RANDOM" ]
},
"power_management" : {
"enabled" : "false",
"options" : {
"option" : [ {
"name" : "secure",
"value" : "false"
} ]
},
"automatic_pm_enabled" : "true",
"kdump_detection" : "true",
"type" : "apc"
},
"ksm" : {
"enabled" : "false"
},
"transparent_hugepages" : {
"enabled" : "true"
},
"iscsi" : {
"initiator" : "iqn.1994-05.com.example:795610ff2632"
},
"ssh" : {
"port" : "22",
},
"cpu" : {
"topology" : {
"sockets" : "1",
"cores" : "4",
"threads" : "1"
},
"name" : "Intel(R) Core(TM)2 Quad CPU  Q9550  @ 2.83GHz",
"speed" : 2833
},
"memory" : 2989490176,
"max_scheduling_memory" : 2584739840,
"summary" : {
"active" : "0",
"migrating" : "0",
"total" : "0"
},
"protocol" : "stomp",
"os" : {
"version" : {
"full_version" : "6Server - 6.6.0.2.el6"
}
},
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"type": "RHEL",

"libvirt_version": {
  "major": "0",
  "minor": "10",
  "build": "2",
  "revision": "0",
  "full_version": "libvirt-0.10.2-46.el6_6.2"
},

"kdump_status": "disabled",

"selinux": {
  "mode": "enforcing"
},

"auto_numa_status": "unknown",

"numa_supported": "false",

"live_snapshot_support": "true",

"actions": {
  "link": [
    {
      "href": "/api/hosts/ea7aa772-d2af-4a5c-9350-d86f005c93fe/fence",
      "rel": "fence"
    },
    {
      "href": "/api/hosts/ea7aa772-d2af-4a5c-9350-d86f005c93fe/approve",
      "rel": "approve"
    },
    {
      "href": "/api/hosts/ea7aa772-d2af-4a5c-9350-d86f005c93fe/forceselectspm",
      "rel": "forceselectspm"
    },
    {
      "href": "/api/hosts/ea7aa772-d2af-4a5c-9350-d86f005c93fe/iscsilogin",
      "rel": "iscsilogin"
    },
    {
      "href": "/api/hosts/ea7aa772-d2af-4a5c-9350-d86f005c93fe/iscsidiscover",
      "rel": "iscsidiscover"
    },
    {
      "href": "/api/hosts/ea7aa772-d2af-4a5c-9350-d86f005c93fe/commitnetconfig",
      "rel": "commitnetconfig"
    },
    {
      "href": "/api/hosts/ea7aa772-d2af-4a5c-9350-d86f005c93fe/deactivate",
      "rel": "deactivate"
    },
    {
      "href": "/api/hosts/ea7aa772-d2af-4a5c-9350-d86f005c93fe/install",
      "rel": "install"
    },
    {
      "href": "/api/hosts/ea7aa772-d2af-4a5c-9350-d86f005c93fe/activate",
      "rel": "activate"
    }
  ]
},

"name": "Host-07"
14.4. POWER MANAGEMENT ELEMENTS

The **power_management** element provides users with the ability to set a power management configuration, which is required for host fencing. Certain sub-elements are required when configuring **power_management**.

Table 14.2. Power management options

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>type=</td>
<td>fencing device</td>
<td>A list of valid fencing device codes are available in the <strong>capabilities</strong> collection.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>code</td>
<td></td>
<td></td>
</tr>
<tr>
<td>enabled</td>
<td>Boolean: true or</td>
<td>Indicates whether power management configuration is enabled or disabled.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>false</td>
<td></td>
<td></td>
</tr>
<tr>
<td>address</td>
<td>string</td>
<td>The host name or IP address of the host.</td>
<td></td>
</tr>
<tr>
<td>Element</td>
<td>Type</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td>--------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>username</td>
<td>string</td>
<td>A valid user name for power management.</td>
<td></td>
</tr>
<tr>
<td>password</td>
<td>string</td>
<td>A valid, robust password for power management.</td>
<td></td>
</tr>
<tr>
<td>options</td>
<td>complex</td>
<td>Fencing options for the selected type= specified with the option name=&quot;&quot; and value=&quot;&quot; strings.</td>
<td></td>
</tr>
<tr>
<td>agents</td>
<td>complex</td>
<td>Specifies fence agent options when multiple fences are used. Use the order sub-element to prioritize the fence agents. Agents are run sequentially according to their order until the fence action succeeds. When two or more fence agents have the same order, they are run concurrently. Other sub-elements include type, ip, user, password, and options.</td>
<td></td>
</tr>
<tr>
<td>automatic_pm_enabled</td>
<td>Boolean: true or false</td>
<td>Toggles the automated power control of the host in order to save energy. When set to true, the host will be automatically powered down if the cluster's load is low, and powered on again when required. This is set to true when a host is created, unless disabled by the user.</td>
<td></td>
</tr>
<tr>
<td>kdump_detection</td>
<td>Boolean: true or false</td>
<td>Toggles whether to determine if kdump is running on the host before it is shut down. When set to true, the host will not shut down during a kdump process. This is set to true when a host has power management enabled, unless disabled by the user.</td>
<td></td>
</tr>
</tbody>
</table>

The options element requires a list of option sub-elements. Each option requires a name and type attributes. Certain options are only available for specific fencing types as defined in the capabilities collection.

A new host includes an optional power_management configuration when POSTing to the host resource. The power_management configuration is updatable using a PUT request.
Example 14.3. An XML representation of a host's power management configuration

```xml
<host id="2ab5e1da-b726-4274-bbf7-0a42b16a0fc3"
     href="/api/hosts/2ab5e1da-b726-4274-bbf7-0a42b16a0fc3">
  <name>host1</name>
  ...
  <power_management type="ilo">
    <enabled>true</enabled>
    <address>192.168.1.107</address>
    <username>admin</username>
    <password>p@55w0Rd!</password>
    <options>
      <option name="secure" value="true"/>
      <option name="port" value="54345"/>
      <option name="slot" value="3"/>
    </options>
  </power_management>
  <agents>
    <agent id="07f0b9ce-923a-4a96-a532-3c898fa8b6da">
      <type>apc</type>
      <order>1</order>
      <ip>192.168.1.111</ip>
      <user>example</user>
      <password>p@55w0rd!</password>
      <port>9</port>
      <options>
        <option name="power_wait" value="5"/>
        <option name="secure" value="false"/>
      </options>
    </agent>
    <agent id="50c71ba2-8495-11e0-b931-e20e458819ed">
      <type>rsa</type>
      <order>2</order>
      <ip>192.168.1.112</ip>
      <user>example</user>
      <password>p@55w0rd!</password>
      <port>9</port>
      <options>
        <option name="power_wait" value="5"/>
        <option name="secure" value="false"/>
      </options>
    </agent>
  </agents>
  <automatic_pm_enabled>true</automatic_pm_enabled>
  <kdump_detection>true</kdump_detection>
</host>
```

14.5. MEMORY MANAGEMENT ELEMENTS

The API provides two configuration settings for a host's memory management.

**Kernel SamePage Merging (KSM)** reduces references to memory pages from multiple identical pages to a single page reference. This helps with optimization for memory density. KSM uses the `ksm` element.
Example 14.4. Setting KSM memory management

PUT /api/hosts/2ab5e1da-b726-4274-bbf7-0a42b16a0fc3 HTTP/1.1
Accept: application/xml
Content-Type: application/xml

<host id="2ab5e1da-b726-4274-bbf7-0a42b16a0fc3"
href="/api/hosts/2ab5e1da-b726-4274-bbf7-0a42b16a0fc3">
  <ksm>true</ksm>
</host>

Transparent Hugepage support expands the size of memory pages beyond the standard 4kB limit. This reduces memory consumption and increases host performance. Transparent Hugepage support uses the transparent_hugepages element.

Example 14.5. Setting Transparent Hugepage memory management

PUT /api/hosts/2ab5e1da-b726-4274-bbf7-0a42b16a0fc3 HTTP/1.1
Accept: application/xml
Content-Type: application/xml

<host id="2ab5e1da-b726-4274-bbf7-0a42b16a0fc3"
href="/api/hosts/2ab5e1da-b726-4274-bbf7-0a42b16a0fc3">
  <transparent_hugepages>true</transparent_hugepages>
</host>

Availability of Transparent Hugepage support is found in the capabilities collection.

14.6. METHODS

14.6.1. Creating a Host

Creation of a new host requires the name, address and root_password elements.

Example 14.6. Creating a host

POST /api/hosts HTTP/1.1
Accept: application/xml
Content-type: application/xml

<head>
  <name>host2</name>
  <address>host2.example.com</address>
  <root_password>p@55w0Rd!</root_password>
</head>

New host creation applies only to the addition of Red Hat Enterprise Linux hosts. Red Hat Enterprise Virtualization Manager detects hypervisor hosts automatically and requires approval for their use.
The **root_password** element is only included in the client-provided initial representation and is not exposed in the representations returned from subsequent requests.

### 14.6.2. Updating a Host

The **name**, **description**, **cluster**, **power_management**, **transparent_hugepages** and **ksm** elements are updatable post-creation.

**Example 14.7. Updating a host**

```plaintext
POST /api/hosts/00000000-0000-0000-0000-000000000000 HTTP/1.1
Accept: application/xml
Content-type: application/xml

<host>
  <name>host3</name>
</host>
```

### 14.6.3. Removing a Host

Removal of a host requires a **DELETE** request.

**Example 14.8. Removing a host**

```plaintext
DELETE /api/hosts/00000000-0000-0000-0000-000000000000 HTTP/1.1
HTTP/1.1 204 No Content
```

### 14.7. SUB-COLLECTIONS

#### 14.7.1. Host Network Attachments Sub-Collection

The **network_attachments** sub-collection represents the network configuration of the host. Each **network_attachment** element represents a network attached to the host and contains the following elements:

**Table 14.3. Elements for a host's network attachments**

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>network id=</td>
<td>GUID</td>
<td>A reference to the network to which the host is attached.</td>
<td>⚠️</td>
</tr>
<tr>
<td>host_nic id=</td>
<td>GUID</td>
<td>A reference to the host network interface to which the network is attached.</td>
<td>⚠️</td>
</tr>
</tbody>
</table>
The IP configuration of the network. Each *ip_address_assignment* contains *assignment_method* and *ip address= netmask= gateway=* sub-elements.

Defines custom property keys for the network. Each *property* contains *name* and *value* sub-elements. See Section 14.7.2.3.2, “Network Attachment Custom Properties”.

A read-only list of configuration properties for the network attachment. The *in_sync* boolean is *false* when the network attachment is out of sync with the logical network definition of the data center. Each *reported_configuration* contains *name, expected_value, actual_value*, and *in_sync* sub-elements.

A reference to the host.

Example 14.9. An XML representation of a network attachment on a host

```xml
<network_attachment href="/api/hosts/00000000-0000-0000-0000-000000000000/networkattachments/00000000-0000-0000-0000-000000000000" id="00000000-0000-0000-0000-000000000000">
  <network href="/api/networks/00000000-0000-0000-0000-000000000009" id="00000000-0000-0000-0000-000000000009"/>
  <host_nic href="/api/hosts/00000000-0000-0000-0000-000000000000/nics/00000000-0000-0000-0000-000000000000" id="00000000-0000-0000-0000-000000000000"/>
  <ip_address_assignments>
    <ip_address_assignment>
      <ip address="XX.XX.XX.XX" netmask="255.255.255.0" gateway="XX.XX.XX.XX"/>
      <assignment_method>dhcp</assignment_method>
    </ip_address_assignment>
  </ip_address_assignments>
  <reported_configurations>
    <in_sync>true</in_sync>
    <reported_configuration>
      <name>mtu</name>
    </reported_configuration>
  </reported_configurations>
</network_attachment>
```
When attaching a network to a host, the **network** and **host_nic** elements are required, with either an **id** or a **name**. The **host_nic** ID can refer to either an unused network interface card or a bond.

**Example 14.10. Attach a network to a host**

```
POST /api/hosts/00000000-0000-0000-0000-000000000000/nics/00000000-0000-0000-0000-000000000000/networkattachments HTTP/1.1
Accept: application/xml
Content-type: application/xml

<network_attachment>
  <network id="00000000-0000-0000-0000-000000000000"/>
  <host_nic id="00000000-0000-0000-0000-000000000000"/>
</network_attachment>
```

The **host_nic**, **ip_address_assignments**, and **properties** elements are updatable post-creation. Changing the **host_nic** ID moves the network to a different network interface card.

**Example 14.11. Modifying a host network attachment**

```
PUT /api/hosts/00000000-0000-0000-0000-000000000000/nics/00000000-0000-0000-0000-000000000000/networkattachments/00000000-0000-0000-0000-000000000000 HTTP/1.1
Accept: application/xml
Content-type: application/xml

<network_attachment>
```
<host_nic id="00000000-0000-0000-0000-000000000000"/>
<ip_address_assignments>
  <ip_address_assignment>
    <ip_address="XX.XX.XX.XX" netmask="255.255.255.0"
    gateway="XX.XX.XX.XX"/>
    <assignment_method>static</assignment_method>
  </ip_address_assignment>
</ip_address_assignments>

Detach a network from the host with a DELETE request on the network attachment.

Example 14.12. Detach a network from a host

DELETE /api/hosts/00000000-0000-0000-0000-000000000000/nics/00000000-0000-0000-0000-000000000000/networkattachments/00000000-0000-0000-0000-000000000000 HTTP/1.1
Accept: application/xml
Content-type: application/xml

HTTP/1.1 204 No Content

IMPORTANT

Changes to network attachment configuration must be explicitly committed. See Section 14.8.9, “Commit Host Network Configuration Action”.

14.7.2. Host Network Interface Sub-Collection

14.7.2.1. Host Network Interface Sub-Collection

The nics sub-collection represents a host's physical network interfaces. Additional information can be retrieved for GET requests using the All-Content: true header. Each host_nic element in the representation acts as a network interface and contains the following elements:

Table 14.4. Elements for a host's network interfaces

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Element</td>
<td>Type</td>
<td>Description</td>
<td>Properties</td>
</tr>
<tr>
<td>--------------------------</td>
<td>------------------</td>
<td>----------------------------------------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>name</td>
<td>string</td>
<td>The name of the host network interface, e.g. <code>eth0</code>.</td>
<td></td>
</tr>
<tr>
<td>link rel=&quot;statistics&quot;</td>
<td>relationship</td>
<td>A link to the <code>statistics</code> sub-collection for a host's network interface statistics.</td>
<td></td>
</tr>
<tr>
<td>link rel=&quot;labels&quot;</td>
<td>relationship</td>
<td>A link to the <code>labels</code> sub-collection for a host's network interface labels.</td>
<td></td>
</tr>
<tr>
<td>link rel=&quot;networkattachment&quot;</td>
<td>relationship</td>
<td>A link to the <code>networkattachments</code> sub-collection for a host's network interface configuration.</td>
<td></td>
</tr>
<tr>
<td>link rel=&quot;master&quot;</td>
<td>relationship</td>
<td>A reference to the master bonded interface, if this is a slave interface.</td>
<td></td>
</tr>
<tr>
<td>host id=</td>
<td>GUID</td>
<td>A reference to the host.</td>
<td></td>
</tr>
<tr>
<td>network id=</td>
<td>GUID</td>
<td>A reference to the network, if any, that the interface is attached.</td>
<td></td>
</tr>
<tr>
<td>mac address=</td>
<td>string</td>
<td>The MAC address of the interface.</td>
<td></td>
</tr>
<tr>
<td>ip address= netmask=</td>
<td>complex</td>
<td>The IP level configuration of the interface.</td>
<td></td>
</tr>
<tr>
<td>gateway= mtu=</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mtu</td>
<td>complex</td>
<td>The maximum transmission unit for the interface.</td>
<td></td>
</tr>
<tr>
<td>boot_protocol</td>
<td>enumerated</td>
<td>The protocol for IP address assignment when the host is booting. A list of enumerated values is available in <code>capabilities</code>.</td>
<td></td>
</tr>
<tr>
<td>status</td>
<td>enumerated</td>
<td>The link status for the network interface. These states are listed in <code>host_nic_states</code> under <code>capabilities</code>.</td>
<td></td>
</tr>
<tr>
<td>Element</td>
<td>Type</td>
<td>Description</td>
<td>Properties</td>
</tr>
<tr>
<td>-----------</td>
<td>---------</td>
<td>-----------------------------------------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>vlan id</td>
<td>integer</td>
<td>The VLAN which this interface represents.</td>
<td>[a]</td>
</tr>
<tr>
<td>bonding</td>
<td>complex</td>
<td>A list of options and slave NICs for bonded interfaces.</td>
<td>[c]</td>
</tr>
<tr>
<td>bridged</td>
<td>Boolean</td>
<td>Defines the bridged network status. Set to true for a bridged network and false for a bridgeless network.</td>
<td>[a] Only required when adding bonded interfaces. Other interfaces are read-only and cannot be added. [b] Only required when adding bonded interfaces. Other interfaces are read-only and cannot be added. [c] Only required when adding bonded interfaces. Other interfaces are read-only and cannot be added.</td>
</tr>
</tbody>
</table>

**Example 14.13. An XML representation of a network interface on a host**

```xml
<host_nic id="00000000-0000-0000-0000-000000000000"
  href="/api/hosts/00000000-0000-0000-0000-000000000000/nics/
  00000000-0000-0000-0000-000000000000">
  <actions>
    <link rel="attach"
      href="/api/hosts/00000000-0000-0000-0000-000000000000/nics/
      00000000-0000-0000-0000-000000000000/attach"/>
    <link rel="detach"
      href="/api/hosts/00000000-0000-0000-0000-000000000000/nics/
      00000000-0000-0000-0000-000000000000/detach"/>
  </actions>
  <name>bond0</name>
  <link href="/api/hosts/00000000-0000-0000-0000-000000000000/nics/
  00000000-0000-0000-0000-000000000000/statistics"
    rel="statistics"/>
  <link href="/api/hosts/00000000-0000-0000-0000-000000000000/nics/
  00000000-0000-0000-0000-000000000000/labels"
    rel="labels"/>
  <link href="/api/hosts/00000000-0000-0000-0000-000000000000/nics/
  00000000-0000-0000-0000-000000000000/networkattachments"
    rel="networkattachments"/>
  <host href="/api/hosts/00000000-0000-0000-0000-000000000000"
    id="00000000-0000-0000-0000-000000000000"/>
  <network href="/api/networks/00000000-0000-0000-0000-000000000000"
    id="00000000-0000-0000-0000-000000000000"/>
  <mac address="00:00:00:00:00:00"/>
  <ip address="XX.XX.XX.XX" netmask="255.255.255.0"
    gateway="XX.XX.XX.XX"/>
  <boot_protocol>dhcp</boot_protocol>
</host_nic>
```
In the REST API, you can only create bonded interfaces. See Section 14.7.2.2, "Bonded Interfaces". All other network interfaces contain updatable `network`, `ip` and `boot_protocol` elements.

Modify a network interface with a **PUT** request.

```
PUT /api/hosts/00000000-0000-0000-0000-000000000000/nics/00000000-0000-0000-0000-000000000000 HTTP/1.1
Accept: application/xml
Content-type: application/xml

<host_nic>
  <ip address="XX.XX.XX.XX" netmask="255.255.255.0" gateway="XX.XX.XX.XX"/>
  <boot_protocol>static</boot_protocol>
</host_nic>
```

Remove a network interface with a **DELETE** request.

```
DELETE /api/hosts/00000000-0000-0000-0000-000000000000/nics/00000000-0000-0000-0000-000000000000 HTTP/1.1
HTTP/1.1 204 No Content
```

**14.7.2.2. Bonded Interfaces**

A bonded interface is represented as a `host_nic` resource containing a `bonding` element.

**Table 14.5. Bonded interface properties**

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
</table>

---

```
<status>
  <state>up</state>
</status>

<bonding>
  <options>
    <option name="mode" value="4" type="Dynamic link aggregation (802.3ad)"/>
    <option name="miimon" value="100"/>
  </options>
  <slaves>
    <host_nic id="00000000-0000-0000-0000-000000000000"/>
    <host_nic id="00000000-0000-0000-0000-000000000000"/>
  </slaves>
</bonding>

<mtu>1500</mtu>
<brided>true
<custom_configuration>false
</host_nic>
```
### An API user creates a new bond when creating a new host_nic (POST) or updating a host_nic (PUT).

Use either the id or name elements to identify the slave host_nic elements. When adding a new network interface, the name and network elements are required. Identify the network element with the id attribute or name element.


```
POST /api/hosts/00000000-0000-0000-0000-000000000000/nics HTTP/1.1
Accept: application/xml
Content-Type: application/xml

:host_nic
  <name>bond4</name>
  <network id="00000000-0000-0000-0000-000000000000"/>
  <bonding>
    <slaves>
      <host_nic id="00000000-0000-0000-0000-000000000000"/>
      <host_nic id="00000000-0000-0000-0000-000000000000"/>
    </slaves>
  </bonding>
</host_nic>
```

**IMPORTANT**

bond0, bond1, bond2, bond3 and bond4 are the only valid names for a bonded interface.

#### Example 14.15. Removing a bonded interface

Remove a bonded interface with a DELETE request.

```
DELETE /api/hosts/00000000-0000-0000-0000-000000000000/nics/00000000-
```
IMPORTANT

Changes to bonded interface configuration must be explicitly committed. See Section 14.8.9, “Commit Host Network Configuration Action”.

14.7.2.3. Network Interface Network Attachments

14.7.2.3.1. Network Interface Network Attachments

Each network interface on a host exposes a network_attachments sub-collection representing the network interface card's network attachments. Each network_attachment represents a network attached to the network interface and contains the following elements:

Table 14.6. Elements for a host network interface’s network attachments

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>network_id=</td>
<td>GUID</td>
<td>A reference to the network to which the interface is attached.</td>
<td></td>
</tr>
<tr>
<td>host_nic_id=</td>
<td>GUID</td>
<td>A reference to the host network interface.</td>
<td></td>
</tr>
<tr>
<td>ip_address_assignments</td>
<td>complex</td>
<td>The IP configuration of the network. Each ip_address_assignment contains assignment_method and ip_address= netmask= gateway= sub-elements.</td>
<td></td>
</tr>
<tr>
<td>properties</td>
<td>complex</td>
<td>Defines custom property keys for the network. Each property contains name and value sub-elements.</td>
<td></td>
</tr>
<tr>
<td>reported_configurations</td>
<td>complex</td>
<td>A read-only list of configuration properties for the network attachment. The in_sync boolean is false when the network attachment contains uncommitted network configuration. Each reported_configuration contains name, expected_value, actual_value, and in_sync sub-elements.</td>
<td></td>
</tr>
</tbody>
</table>

Example 14.16. An XML representation of a network attachment on a network interface card
When attaching a network to a network interface card, the network element is required, with either an id or a name.

Example 14.17. Attach a network to a host network interface card

POST /api/hosts/00000000-0000-0000-0000-000000000000/nics/00000000-0000-0000-0000-000000000000/networkattachments HTTP/1.1
Accept: application/xml
Content-type: application/xml
The **ip_address_assignments** and **properties** elements are updatable post-creation.

**Example 14.18. Modifying a network attachment**

```xml
PUT /api/hosts/00000000-0000-0000-0000-000000000000/nics/00000000-0000-0000-0000-000000000000/networkattachments/00000000-0000-0000-0000-000000000000 HTTP/1.1
Accept: application/xml
Content-type: application/xml

<networkattachment>
  <ip_address_assignments>
    <ip_address_assignment>
      <ip address="XX.XX.XX.XX" netmask="255.255.255.0" gateway="XX.XX.XX.XX"/>
      <assignment_method>static</assignment_method>
    </ip_address_assignment>
  </ip_address_assignments>
</networkattachment>
```

Detach a network from the network interface card with a **DELETE** request on the network attachment.

**Example 14.19. Detach a network from a host network interface card**

```xml
DELETE /api/hosts/00000000-0000-0000-0000-000000000000/nics/00000000-0000-0000-0000-000000000000/networkattachments/00000000-0000-0000-0000-000000000000 HTTP/1.1
Accept: application/xml
Content-type: application/xml

HTTP/1.1 204 No Content
```

**IMPORTANT**

Changes to network attachment configuration must be explicitly committed. See Section 14.8.9, “Commit Host Network Configuration Action”.

**14.7.2.3.2. Network Attachment Custom Properties**

Custom properties can be applied to network attachments. Each property contains **name** and **value** sub-elements. To amend the custom properties, perform a **PUT** request on a network attachment, or a **POST** request with the **setupnetworks** action.

**Table 14.7. Elements for custom bridge options for a host’s network interface**
<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>string</td>
<td>The unique identifier for the property. Bridge options have the set name of <code>bridge_opts</code>.</td>
</tr>
<tr>
<td>value</td>
<td>string</td>
<td>The bridge options, represented by a valid key and value with the following syntax: [key]=[value]. Separate multiple entries with a whitespace character. The following keys are valid, with the values provided as examples:</td>
</tr>
</tbody>
</table>
You can attach labels to a host network interface card to automate the association of that network interface card with logical networks to which the same label has been attached.

**Example 14.21. Attaching a label to a network interface card**

```plaintext
POST /api/hosts/00000000-0000-0000-0000-000000000000/nics/00000000-0000-0000-0000-000000000000/labels HTTP/1.1
Accept: application/xml
Content-type: application/xml

<label id="Label_001" />
```

Removal of a label from a physical host network interface card requires a **DELETE** request.

**Example 14.22. Removing a label from a network interface card**

```plaintext
DELETE /api/hosts/00000000-0000-0000-0000-000000000000/nics/00000000-0000-0000-0000-000000000000/labels/00000000-0000-0000-0000-000000000000 HTTP/1.1

HTTP/1.1 204 No Content
```

**14.7.2.5. Network Interface Statistics**

Each host’s network interface exposes a **statistics** sub-collection for a host’s network interface statistics. Each **statistic** contains the following elements:

**Table 14.8. Elements for a host’s network interface statistics**

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>string</td>
<td>The unique identifier for the statistic entry.</td>
</tr>
<tr>
<td>description</td>
<td>string</td>
<td>A plain text description of the statistic.</td>
</tr>
<tr>
<td>unit</td>
<td>string</td>
<td>The unit or rate to measure the statistical values.</td>
</tr>
<tr>
<td>type</td>
<td>One of <strong>GAUGE</strong> or <strong>COUNTER</strong></td>
<td>The type of statistic measures.</td>
</tr>
<tr>
<td>values type=</td>
<td>One of <strong>INTEGER</strong> or <strong>DECIMAL</strong></td>
<td>The data type for the statistical values that follow.</td>
</tr>
<tr>
<td>value</td>
<td>complex</td>
<td>A data set that contains <strong>datum</strong>.</td>
</tr>
<tr>
<td>datum</td>
<td>see values type</td>
<td>An individual piece of data from a <strong>value</strong>.</td>
</tr>
<tr>
<td>host_nic id=</td>
<td>relationship</td>
<td>A relationship to the containing <strong>host_nic</strong> resource.</td>
</tr>
</tbody>
</table>
The following table lists the statistic types for network interfaces on hosts.

### Table 14.9. Host NIC statistic types

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>data.current.rx</td>
<td>The rate in bytes per second of data received.</td>
</tr>
<tr>
<td>data.current.tx</td>
<td>The rate in bytes per second of data transmitted.</td>
</tr>
<tr>
<td>data.total.rx</td>
<td>Total received data.</td>
</tr>
<tr>
<td>data.total.tx</td>
<td>Total transmitted data.</td>
</tr>
<tr>
<td>errors.total.rx</td>
<td>Total errors from receiving data.</td>
</tr>
<tr>
<td>errors.total.tx</td>
<td>Total errors from transmitting data.</td>
</tr>
</tbody>
</table>

**Example 14.23. An XML representation of a host's network interface statistics sub-collection**

```xml
<statistics>
    <statistic id="00000000-0000-0000-0000-000000000000"
        href="/api/hosts/00000000-0000-0000-0000-000000000000/nics/
            00000000-0000-0000-0000-000000000000/statistics/
            00000000-0000-0000-0000-000000000000">
        <name>data.current.rx</name>
        <description>Receive data rate</description>
        <values type="DECIMAL">
            <value>
                <datum>0</datum>
            </value>
        </values>
        <type>GAUGE</type>
        <unit>BYTES_PER_SECOND</unit>
        <host_nic id="00000000-0000-0000-0000-000000000000"
            href="/api/hosts/00000000-0000-0000-0000-000000000000/nics/
                00000000-0000-0000-0000-000000000000/statistics/
                00000000-0000-0000-0000-000000000000">
        </host_nic>
    </statistic>
    ...
</statistics>
```

**NOTE**

This statistics sub-collection is read-only.

### 14.7.3. Storage Sub-Collection
The storage sub-collection provides a list of the iSCSI and FCP storage representations available on the host. This storage is used to create storage domains.

Each storage representation in the sub-collection represents a SCSI LUN.

**Example 14.24. An XML representation of the storage sub-collection on a host**

```
<host_storage>
  <storage id="82fb123b-321e-40a1-9889-95dcd2654463" href="/api/hosts/2ab5e1da-b726-4274-bbf7-0a42b16a0fc3/storage/82fb123b-321e-40a1-9889-95dcd2654463">
    <name>LUN0</name>
    <type>iscsi</type>
    <logical_unit id="LUN0">
      <address>mysan.example.com</address>
      <target>iqn.2009-08.com.example:mysan.foobar</target>
    </logical_unit>
  </storage>
</host_storage>
```

**NOTE**

The host_storage collection is read-only.

**IMPORTANT**

The API as documented in this section is experimental and subject to change. It is not covered by the backwards compatibility statement.

### 14.7.4. Host NUMA Nodes Sub-Collection

**14.7.4.1. NUMA Nodes Sub-Collection**

The numanodes sub-collection represents the host's NUMA topology. Each host_numa_node element in the sub-collection represents a NUMA node.

**Example 14.25. An XML representation of the numanodes sub-collection on a host**

```
<host_numa_nodes>
  <host_numa_node href="/api/hosts/f6735fa9-4ee5-47ce-b750-a87863736cc2/numanodes/91d8537c-699e-460b-9a70-285f651e7d68" id="91d8537c-699e-460b-9a70-285f651e7d68">
    <link href="/api/hosts/f6735fa9-4ee5-47ce-b750-a87863736cc2/numanodes/91d8537c-699e-460b-9a70-285f651e7d68/statistics" rel="statistics"/>
    <host href="/api/hosts/f6735fa9-4ee5-47ce-b750-a87863736cc2" id="f6735fa9-4ee5-47ce-b750-a87863736cc2">/
      <index id="0"></index>
      <memory>8157</memory>
      <cpu>
        <cores>
          <core index="0"/>
```
NOTE

The host_numa_nodes sub-collection is read-only.

14.7.4.2. NUMA Node Statistics

Each host NUMA node exposes a statistics sub-collection for NUMA node statistics. Each statistic contains the following elements:

Table 14.10. Elements for a host's NUMA node statistics

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>string</td>
<td>The unique identifier for the statistic entry.</td>
</tr>
<tr>
<td>description</td>
<td>string</td>
<td>A plain text description of the statistic.</td>
</tr>
<tr>
<td>unit</td>
<td>string</td>
<td>The unit or rate to measure the statistical values.</td>
</tr>
<tr>
<td>type</td>
<td>One of GAUGE or COUNTER</td>
<td>The type of statistic measures.</td>
</tr>
</tbody>
</table>
values type= One of INTEGER or DECIMAL
The data type for the statistical values that follow.

value complex A data set that contains datum.
datum see values type An individual piece of data from a value.
host_numa_node id= relationship A relationship to the containing numanode resource.

The following table lists the statistic types for host NUMA nodes.

### Table 14.11. Host NUMA node statistics

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>memory.total</td>
<td>Total memory in bytes on the NUMA node.</td>
</tr>
<tr>
<td>memory.used</td>
<td>Memory in bytes used on the NUMA node.</td>
</tr>
<tr>
<td>memory.free</td>
<td>Memory in bytes free on the NUMA node.</td>
</tr>
<tr>
<td>cpu.current.user</td>
<td>Percentage of CPU usage for users.</td>
</tr>
<tr>
<td>cpu.current.system</td>
<td>Percentage of CPU usage for the system.</td>
</tr>
<tr>
<td>cpu.current.idle</td>
<td>Percentage of idle CPU usage.</td>
</tr>
</tbody>
</table>

**Example 14.26. An XML representation of the host NUMA node’s statistics sub-collection**

```xml
<statistics>
    <statistic href="/api/hosts/f6745fa9-4ee5-47ce-b750-a87863736cc2/numanodes/91d8537c-689e-460b-9a70-285f651e7d68/statistics/7816602b-c05c-3dc7-a4da-3769f7ad8896"
        id="7816602b-c05c-3dc7-a4da-3769f7ad8896">
        <name>memory.total</name>
        <description>Total memory</description>
        <values type="INTEGER">
            <value>
                <datum>8157</datum>
            </value>
        </values>
        <type>GAUGE</type>
        <unit>BYTES</unit>
        <host_numa_node href="/api/hosts/f6745fa9-4ee5-47ce-b750-a87863736cc2/numanodes/91d8537c-689e-460b-9a70-285f651e7d68"
            id="91d8537c-689e-460b-9a70-285f651e7d68"/>
    </statistic>
</statistics>
```
NOTE

A host NUMA node’s statistics sub-collection is read-only.

14.7.5. Host Statistics Sub-Collection

14.7.5.1. Host Statistics Sub-Collection

Each host resource exposes a statistics sub-collection for host-specific statistics. Each statistic contains the following elements:

Table 14.12. Elements for host statistics

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>string</td>
<td>The unique identifier for the statistic entry.</td>
</tr>
<tr>
<td>description</td>
<td>string</td>
<td>A plain text description of the statistic.</td>
</tr>
<tr>
<td>unit</td>
<td>string</td>
<td>The unit or rate to measure the statistical values.</td>
</tr>
<tr>
<td>type</td>
<td>One of GAUGE or COUNTER</td>
<td>The type of statistic measures.</td>
</tr>
<tr>
<td>values type=</td>
<td>One of INTEGER or DECIMAL</td>
<td>The data type for the statistical values that follow.</td>
</tr>
<tr>
<td>value</td>
<td>complex</td>
<td>A data set that contains datum.</td>
</tr>
<tr>
<td>datum</td>
<td>see values type</td>
<td>An individual piece of data from a value.</td>
</tr>
<tr>
<td>host id=</td>
<td>relationship</td>
<td>A relationship to the containing host resource.</td>
</tr>
</tbody>
</table>

The following table lists the statistic types for hosts.

Table 14.13. Host statistic types

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>memory.total</td>
<td>Total memory in bytes on the host.</td>
</tr>
<tr>
<td>memory.used</td>
<td>Memory in bytes used on the host.</td>
</tr>
<tr>
<td><strong>Name</strong></td>
<td><strong>Description</strong></td>
</tr>
<tr>
<td>---------------</td>
<td>----------------------------------------------</td>
</tr>
<tr>
<td>memory.free</td>
<td>Memory in bytes free on the host.</td>
</tr>
<tr>
<td>memory.shared</td>
<td>Memory in bytes shared on the host.</td>
</tr>
<tr>
<td>memory.buffers</td>
<td>I/O buffers in bytes.</td>
</tr>
<tr>
<td>memory.cached</td>
<td>OS caches in bytes.</td>
</tr>
<tr>
<td>swap.total</td>
<td>Total swap memory in bytes on the host.</td>
</tr>
<tr>
<td>swap.free</td>
<td>Swap memory in bytes free on the host.</td>
</tr>
<tr>
<td>swap.used</td>
<td>Swap memory in bytes used on the host.</td>
</tr>
<tr>
<td>swap.cached</td>
<td>Swap memory in bytes also cached in host's memory.</td>
</tr>
<tr>
<td>ksm.cpu.current</td>
<td>Percentage of CPU usage for Kernel SamePage Merging.</td>
</tr>
<tr>
<td>cpu.current.user</td>
<td>Percentage of CPU usage for users.</td>
</tr>
<tr>
<td>cpu.current.system</td>
<td>Percentage of CPU usage for system.</td>
</tr>
<tr>
<td>cpu.current.idle</td>
<td>Percentage of idle CPU usage.</td>
</tr>
<tr>
<td>cpu.load.avg.5m</td>
<td>CPU load average per five minutes.</td>
</tr>
</tbody>
</table>

**Example 14.27. An XML representation of the host's statistics sub-collection**

```xml
<statistics>
  <statistic id="4ae97794-f56d-3f05-a9e7-8798887cd1ac"
    href="/api/hosts/2ab5e1da-b726-4274-bbf7-0a42b16a0fc3/
    statistics/4ae97794-f56d-3f05-a9e7-8798887cd1ac">
    <name>memory.total</name>
    <description>Total memory</description>
    <unit>BYTES</unit>
    <type>GAUGE</type>
    <values type="INTEGER">
      <value>
        <datum>3983540224</datum>
      </value>
    </values>
  </statistic>
  ...
</statistics>
```
14.8. ACTIONS

14.8.1. Install VDSM Action

Install VDSM and related software on the host. The host type defines additional parameters for the action.

- **Red Hat Enterprise Linux host** - This host type requires a `root_password` element that refers to the password for the host's root user.

- **Red Hat Enterprise Virtualization Hypervisor host** - This host type requires an `image` element that refers to an ISO file stored on the Red Hat Enterprise Virtualization Manager server.

**Example 14.28. Action to install VDSM to a Red Hat Enterprise Linux host**

```
POST /api/hosts/2ab5e1da-b726-4274-bbf7-0a42b16a0fc3/install HTTP/1.1
Accept: application/xml
Content-type: application/xml

<action>
  <root_password>p@55w0Rd!</root_password>
</action>
```

**Example 14.29. Action to install VDSM to a Red Hat Enterprise Virtualization Hypervisor host**

```
POST /api/hosts/2ab5e1da-b726-4274-bbf7-0a42b16a0fc3/install HTTP/1.1
Accept: application/xml
Content-type: application/xml

<action>
  <image>/usr/share/rhev-hypervisor/rhev-hypervisor.iso</image>
</action>
```

14.8.2. Activate Host Action

Activate the host for use, such as running virtual machines.

**Example 14.30. Action to activate a host**

```
POST /api/hosts/2ab5e1da-b726-4274-bbf7-0a42b16a0fc3/activate HTTP/1.1
Accept: application/xml
Content-type: application/xml

<action/>
```
14.8.3. Host Network Setup Action

Configure multiple network settings on a host. The setupnetworks action can be used for complex network configuration such as moving a network from one network interface to another.

Example 14.31. Action to edit host network configuration

POST /api/hosts/2ab5e1da-b726-4274-bbf7-0a42b16a0fc3/setupnetworks
HTTP/1.1
Accept: application/xml
Content-type: application/xml

<action>
  <modified_network_attachments>
    <network_attachment id="41561e1c-c653-4b45-b9c9-126630e8e3b9">
      <host_nic id="857a46d3-5f64-68bd-f456-c70de5b2d569"/>
    </network_attachment>
    <network_attachment id="3c3f442f-948b-4cdc-9a48-89bb0593cfbd">
      <network id="00000000-0000-0000-0000-000000000010"/>
      <ip address="10.35.1.247" netmask="255.255.254.0" gateway="10.35.1.254"/>
      <properties>
        <property>
          <name>bridge_opts</name>
          <value>
            forward_delay=1500 group_fwd_mask=0x0 multicast_snooping=1
          </value>
        </property>
      </properties>
    </network_attachment>
  </modified_network_attachments>
  <synchronized_network_attachments>
    <network_attachment id="3c3f442f-948b-4cdc-9a48-89bb0593cfbd"/>
  </synchronized_network_attachments>
  <removed_network_attachments>
    <network_attachment id="7f456dae-c57f-35d5-55a4-20b74dc53af9"/>
  </removed_network_attachments>
  <modified_bonds>
    <host_nic id="a56b212d-2bc4-4120-9136-53be6cab39a">
      <bonding>
        <slaves>
          <host_nic id="75ac21f7-4aa3-405a-a022-341e5f525b85"/>
          <host_nic id="f3dda04c-1233-41af-a111-74327b876487"/>
        </slaves>
      </bonding>
    </host_nic>
  </modified_bonds>
  <removed_bonds>
    <host_nic id="36ab5c7f-647a-bc64-f5e7-ba5d74f8e4ba"/>
  </removed_bonds>
  <modified_labels>
    <label id="Label002">
      <host_nic id="857a46d3-5f64-68bd-f456-c70de5b2d569"/>
    </label>
  </modified_labels>
</action>
This action updates all specified host network resources with standard NIC elements. The request includes additional elements specified in the following table.

**Table 14.14. Elements for multiple host network interface setup**

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>modified_bonds</td>
<td>complex</td>
<td>Creates or updates bonds. Each <code>host_nic</code> element contains standard <code>bonding</code> elements. See Section 14.7.2.2, &quot;Bonded Interfaces&quot;.</td>
</tr>
<tr>
<td>removed_bonds</td>
<td>complex</td>
<td>An ID list of bonds to remove.</td>
</tr>
<tr>
<td>modified_networkAttachments</td>
<td>complex</td>
<td>Adds or updates network attachments on the host. Each <code>network_attachment</code> element contains standard host <code>network_attachment</code> elements. See Section 14.7.1, &quot;Host Network Attachments Sub-Collection&quot;. Changing the <code>host_nic</code> ID moves the network to a different network interface card.</td>
</tr>
<tr>
<td>synchronized_networkAttachments</td>
<td>complex</td>
<td>An ID list of out-of-sync network attachments to synchronize with the logical network definition of the data center.</td>
</tr>
<tr>
<td>removed_networkAttachments</td>
<td>complex</td>
<td>An ID list of network attachments to remove.</td>
</tr>
<tr>
<td>modified_labels</td>
<td>complex</td>
<td>Creates or modifies labels. Each <code>label</code> element contains a <code>label_id</code> (when creating a label) and a <code>host_nic</code> identified by a name or ID. Changing the <code>host_nic</code> ID moves the label to a different network interface card.</td>
</tr>
<tr>
<td>removed_labels</td>
<td>complex</td>
<td>An ID list of labels to remove.</td>
</tr>
</tbody>
</table>
### 14.8.4. Fence Host Action

An API user controls a host's power management device with the `fence` action. The `capabilities` lists available `fence_type` options.

#### Example 14.32. Action to fence a host

```
POST /api/hosts/2ab5e1da-b726-4274-bbf7-0a42b16a0fc3/fence
Accept: application/xml
Content-Type: application/xml

<action>
  <fence_type>start</fence_type>
</action>
```

### 14.8.5. Deactivate Host Action

Deactivate the host to perform maintenance tasks.

#### Example 14.33. Action to deactivate a host

```
POST /api/hosts/2ab5e1da-b726-4274-bbf7-0a42b16a0fc3/deactivate HTTP/1.1
Accept: application/xml
Content-type: application/xml

<action/>
```

### 14.8.6. Approve Host Action

Approve a pre-installed Red Hat Enterprise Virtualization Hypervisor host for usage in the virtualization environment. This action also accepts an optional `cluster` element to define the target cluster for this host.

#### Example 14.34. Action to approve a host

```
POST /api/hosts/2ab5e1da-b726-4274-bbf7-0a42b16a0fc3/approve HTTP/1.1
Accept: application/xml
Content-type: application/xml
```

### 14.8.4. Fence Host Action

An API user controls a host's power management device with the `fence` action. The `capabilities` lists available `fence_type` options.

#### Example 14.32. Action to fence a host

```
POST /api/hosts/2ab5e1da-b726-4274-bbf7-0a42b16a0fc3/fence
Accept: application/xml
Content-Type: application/xml

<action>
  <fence_type>start</fence_type>
</action>
```

### 14.8.5. Deactivate Host Action

Deactivate the host to perform maintenance tasks.

#### Example 14.33. Action to deactivate a host

```
POST /api/hosts/2ab5e1da-b726-4274-bbf7-0a42b16a0fc3/deactivate HTTP/1.1
Accept: application/xml
Content-type: application/xml

<action/>
```

### 14.8.6. Approve Host Action

Approve a pre-installed Red Hat Enterprise Virtualization Hypervisor host for usage in the virtualization environment. This action also accepts an optional `cluster` element to define the target cluster for this host.

#### Example 14.34. Action to approve a host

```
POST /api/hosts/2ab5e1da-b726-4274-bbf7-0a42b16a0fc3/approve HTTP/1.1
Accept: application/xml
Content-type: application/xml
```
14.8.7. Host iSCSI Login Action

The `iscsilogin` action enables a host to login to an iSCSI target. Logging into a target makes the contained LUNs available in the `host_storage` collection.

Example 14.35. Action to enable a host to login to iSCSI target

```
POST /api/hosts/2ab5e1da-b726-4274-bbf7-0a42b16a0fc3/iscsilogin HTTP/1.1
Accept: application/xml
Content-Type: application/xml

<action>
  <iscsi>
    <address>mysan.example.com</address>
    <target>iqn.2009-08.com.example:mysan.foobar</target>
    <username>jimmy</username>
    <password>s3kr37</password>
  </iscsi>
</action>
```

14.8.8. Host iSCSI Discover Action

The `iscsidiscover` action enables an iSCSI portal to be queried for its list of targets.

Example 14.36. Action to query a list of targets for iSCSI portal

```
POST /api/hosts/2ab5e1da-b726-4274-bbf7-0a42b16a0fc3/iscsidiscover HTTP/1.1
Accept: application/xml
Content-Type: application/xml

<action>
  <iscsi>
    <address>mysan.example.com</address>
    <port>3260</port>
  </iscsi>
</action>
```

14.8.9. Commit Host Network Configuration Action

An API user commits the network configuration to persist a host network interface attachment or detachment, or persist the creation and deletion of a bonded interface.
Example 14.37. Action to commit network configuration

POST /api/hosts/2ab5e1da-b726-4274-bbf7-0a42b16a0fc3/commitnetconfig
HTTP/1.1
Accept: application/xml
Content-type: application/xml

[action/]

**IMPORTANT**

Networking configuration is only committed after the Manager has established that host connectivity is not lost as a result of the configuration changes. If host connectivity is lost, the host requires a reboot and automatically reverts to the previous networking configuration.

14.8.10. Setting SPM

Manually set a host as the Storage Pool Manager (SPM).

Example 14.38. Action to Set Host as SPM

POST /api/hosts/2ab5e1da-b726-4274-bbf7-0a42b16a0fc3/forceselectspm
HTTP/1.1
Accept: application/xml
Content-type: application/xml

[action/]
CHAPTER 15. VIRTUAL MACHINES

15.1. VIRTUAL MACHINE ELEMENTS

The `vms` collection provides information about virtual machines in a Red Hat Enterprise Virtualization environment. An API user accesses this information through the `rel="vms"` link obtained from the entry point URI.

Additional information can be retrieved for `GET` requests using the `All-Content: true` header.

The following table shows specific elements contained in a virtual machine resource representation.

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>link rel=&quot;applications&quot;</td>
<td>relationship</td>
<td>A link to the <code>applications</code> sub-collection for virtual machine resources, which shows the applications installed on the virtual machine.</td>
</tr>
<tr>
<td>link rel=&quot;disks&quot;</td>
<td>relationship</td>
<td>A link to the <code>disks</code> sub-collection for virtual machine resources.</td>
</tr>
<tr>
<td>link rel=&quot;nics&quot;</td>
<td>relationship</td>
<td>A link to the <code>nics</code> sub-collection for virtual machine resources.</td>
</tr>
<tr>
<td>link rel=&quot;numanodes&quot;</td>
<td>relationship</td>
<td>A link to the <code>numanodes</code> sub-collection for virtual machine resources.</td>
</tr>
<tr>
<td>link rel=&quot;cdroms&quot;</td>
<td>relationship</td>
<td>A link to the <code>cdroms</code> sub-collection for virtual machine resources.</td>
</tr>
<tr>
<td>link rel=&quot;snapshots&quot;</td>
<td>relationship</td>
<td>A link to the <code>snapshots</code> sub-collection for virtual machine resources.</td>
</tr>
<tr>
<td>link rel=&quot;tags&quot;</td>
<td>relationship</td>
<td>A link to the <code>tags</code> sub-collection for virtual machine resources.</td>
</tr>
<tr>
<td>link rel=&quot;permissions&quot;</td>
<td>relationship</td>
<td>A link to the <code>permissions</code> sub-collection for virtual machine permissions.</td>
</tr>
<tr>
<td>link rel=&quot;statistics&quot;</td>
<td>relationship</td>
<td>A link to the <code>statistics</code> sub-collection for virtual machine resources.</td>
</tr>
<tr>
<td>Element</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>----------</td>
<td>----------</td>
<td>-------------</td>
</tr>
<tr>
<td>link rel=&quot;reporteddevices&quot;</td>
<td>relationship</td>
<td>A link to the <code>reporteddevices</code> sub-collection for virtual machine resources.</td>
</tr>
<tr>
<td>link rel=&quot;watchdogs&quot;</td>
<td>relationship</td>
<td>A link to the <code>watchdogs</code> sub-collection for virtual machine resources.</td>
</tr>
<tr>
<td>link rel=&quot;sessions&quot;</td>
<td>relationship</td>
<td>A link to the <code>sessions</code> sub-collection for virtual machine resources.</td>
</tr>
<tr>
<td>type</td>
<td>enumerated</td>
<td>The virtual machine type. A list of enumerated values are available in <code>capabilities</code>.</td>
</tr>
<tr>
<td>status</td>
<td>See below</td>
<td>The virtual machine status.</td>
</tr>
<tr>
<td>memory</td>
<td>integer</td>
<td>The amount of memory allocated to the guest in bytes.</td>
</tr>
<tr>
<td>cpu</td>
<td>complex</td>
<td>Defines CPU details for the virtual machine. The <code>topology</code> sub-element sets number of logical <code>sockets</code> available to the guest and the number of <code>cores</code> per socket. The total cores available to the virtual machine equals the number of sockets multiplied by the cores per socket. The <code>cputune</code> sub-element maps virtual CPUs to physical host CPUs using a series of <code>vcpupin</code> elements. Each <code>vcpupin</code> elements contains a virtual CPU attribute (<code>vcpu</code>) and an attribute to define which physical to use (<code>cpuset</code>). Set the <code>cpuset</code> to either a single CPU (<code>cpuset=&quot;0&quot;</code>), multiple CPUs (<code>cpuset=&quot;0,2&quot;</code>), a CPU range (<code>cpuset=&quot;0-3&quot;</code>) or a CPU range with exclusion (<code>cpuset=&quot;0-3,^2&quot;</code>). The <code>cpu_mode</code> sub-element defines how closely the virtual CPU relates to the host CPU. It has three values: <code>custom</code> is the default if no mode is given, <code>host_model</code> copies the host CPU as best as libvirt can understand, and <code>host_passthrough</code> passes all aspects of the host to the guest, even those that libvirt does not recognize. However, <code>host_passthrough</code> will prevent migration of that virtual machine.</td>
</tr>
<tr>
<td>os type</td>
<td>string, e.g. RHEL5 or WindowsXP</td>
<td>The guest operating system type.</td>
</tr>
<tr>
<td>Element</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>------------------</td>
<td>-----------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>os boot dev=</td>
<td>enumerated</td>
<td>A list of boot devices described by a dev attribute on a boot element. A list of enumerated values are available in capabilities.</td>
</tr>
<tr>
<td>os kernel</td>
<td>string</td>
<td>A path to a kernel image the virtual machine is configured to boot. This option supports booting a Linux kernel directly rather than through the BIOS bootloader.</td>
</tr>
<tr>
<td>os initrd</td>
<td>string</td>
<td>A path to an initrd image to be used with the previously specified kernel. This option supports booting a Linux kernel directly rather than through the BIOS bootloader.</td>
</tr>
<tr>
<td>os cmdline</td>
<td>string</td>
<td>A kernel command line parameter string to be used with the defined kernel. This option supports booting a Linux kernel directly rather than through the BIOS bootloader.</td>
</tr>
<tr>
<td>high_availability</td>
<td>complex</td>
<td>Set enabled to true if the virtual machine should be automatically restarted if the virtual machine or its host crashes. A priority element controls the order in which virtual machines are re-started.</td>
</tr>
<tr>
<td>display</td>
<td>complex</td>
<td>The display type (either vnc or spice), port, and the number of monitors. The allow_reconnect Boolean value specifies if a client can reconnect to the machine via display. The smartcard_enabled sub-element is a Boolean (true or false) to specify if a Smartcard attached to a client is passed through to a virtual machine. The default is false.</td>
</tr>
<tr>
<td>cluster id=</td>
<td>GUID</td>
<td>A reference to the virtual machine's host cluster.</td>
</tr>
<tr>
<td>template id=</td>
<td>GUID</td>
<td>A reference to the template on which this virtual machine is based.</td>
</tr>
<tr>
<td>domain id=</td>
<td>GUID</td>
<td>A reference to the virtual machine's domain.</td>
</tr>
<tr>
<td>Element</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>------------------</td>
<td>-------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>start_time</td>
<td>xsd:dateTime format: YYYY-MM-DDTh:mm:ss</td>
<td>The date and time at which this virtual machine was started.</td>
</tr>
<tr>
<td>stop_time</td>
<td>xsd:dateTime format: YYYY-MM-DDTh:mm:ss</td>
<td>The date and time at which this virtual machine was stopped.</td>
</tr>
<tr>
<td>creation_time</td>
<td>xsd:dateTime format: YYYY-MM-DDTh:mm:ss</td>
<td>The date and time at which this virtual machine was created.</td>
</tr>
<tr>
<td>origin</td>
<td>One of rhev, ovirt, vmware or xen</td>
<td>The system from which this virtual machine originated.</td>
</tr>
<tr>
<td>stateless</td>
<td>Boolean: true or false</td>
<td>true if the virtual machine is stateless. A stateless virtual machine contains a snapshot of its disk image taken at boot and deleted at shutdown. This means state changes do not persist after a reboot.</td>
</tr>
<tr>
<td>delete_protected</td>
<td>Boolean: true or false</td>
<td>If set to true, the virtual machine cannot be deleted.</td>
</tr>
<tr>
<td>sso</td>
<td>string</td>
<td>A reference to the method of single sign-on for the virtual machine. Includes a method element with an ip attribute.</td>
</tr>
<tr>
<td>placement_policy</td>
<td>complex</td>
<td>Sets the placement policy for virtual machine migration. Requires a default host= and an affinity (one of migratable, user_migratable or pinned). Leave the host element empty to set no preferred host. Use multiple host elements to specify a subset of preferred hosts within a cluster.</td>
</tr>
<tr>
<td>memory_policy</td>
<td>complex</td>
<td>Sets the memory policy for virtual machines. Defines the minimum amount of guaranteed memory on a host in order for the virtual machine to run.</td>
</tr>
<tr>
<td>quota_id=</td>
<td>GUID</td>
<td>Sets a quota for the virtual machine.</td>
</tr>
<tr>
<td>Element</td>
<td>Type</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------</td>
<td>----------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>custom_properties</td>
<td>complex</td>
<td>A set of user-defined environment variable passed as parameters to custom scripts. Each custom_property contains name and value attributes. A list of enumerated values are available in capabilities.</td>
</tr>
<tr>
<td>usb</td>
<td>complex</td>
<td>Defines the USB policy for a virtual machine. Requires an enabled element set to a Boolean value and a type element set to either native or legacy.</td>
</tr>
<tr>
<td>migration_downtime</td>
<td>integer</td>
<td>Represents the maximum number of milliseconds the virtual machine can be down during live migration. A value of 0 means that the VDSM default will be used.</td>
</tr>
<tr>
<td>cpu_profile id=</td>
<td>GUID</td>
<td>A reference to the virtual machine's cpu profile.</td>
</tr>
<tr>
<td>next_run_configuration</td>
<td>Boolean: true or false</td>
<td>true if changes to the virtual machine's configuration will be applied when the virtual machine is next restarted.</td>
</tr>
<tr>
<td>numa_tune_mode</td>
<td>string</td>
<td>Reference to the mode of memory allocation (interleave, strict, or preferred) of the host NUMA node.</td>
</tr>
<tr>
<td>guest_info</td>
<td>complex</td>
<td>A reference to the guest client information. Includes an ip element with an address= attribute.</td>
</tr>
<tr>
<td>vmpool</td>
<td>complex</td>
<td>A reference to the virtual machine pool. This element only appears for virtual machines part of a pool.</td>
</tr>
<tr>
<td>timezone</td>
<td>tz database format: Area/Location</td>
<td>The Sysprep timezone setting for a Windows virtual machine.</td>
</tr>
<tr>
<td>domain</td>
<td>complex</td>
<td>The Sysprep domain setting for a Windows virtual machine. Requires a name from the domains collection.</td>
</tr>
<tr>
<td>initialization</td>
<td>complex</td>
<td>Defines a list of values applied to the virtual machine on boot using Cloud-Init for Linux-based virtual machines, or Sysprep for Windows-based virtual machines.</td>
</tr>
</tbody>
</table>

Cloud-Init
<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>• <strong>host_name</strong>: The host name of the virtual machine.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>timezone</strong>: The time zone for the virtual machine.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>user_name</strong>: The user name for the virtual machine.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>root_password</strong>: The password for the user, or root password if no user is specified.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>authorized_ssh_keys</strong>: SSH keys to be added to the authorized keys file of the virtual machine. You can enter multiple SSH keys by separating each SSH key with a line break.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>regenerate_ssh_keys</strong>: Whether to regenerate SSH key for the virtual machine. Possible values are <strong>true</strong> or <strong>false</strong>.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>dns_servers</strong>: A space-separated list of DNS servers.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>dns_search</strong>: A space-separated list of DNS search domains.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>nic_configurations</strong>: Defines a network interface controller for the virtual machine. Network interface controllers are defined as <strong>nic_configuration</strong> objects under this collection that each specify the <strong>name</strong>, <strong>ip</strong>, <strong>boot_protocol</strong>, and <strong>on_boot</strong>.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>custom_script</strong>: A custom script to run on the virtual machine when it starts.</td>
<td></td>
</tr>
</tbody>
</table>

**Sysprep**

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>• <strong>host_name</strong>: The host name of the virtual machine.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>domain</strong>: The domain of which the virtual machine is a member.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>authorized_ssh_keys</strong>: SSH keys to be added to the authorized keys file of the virtual machine. You can enter multiple SSH keys by separating each SSH key with a line break.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>regenerate_ssh_keys</strong>: Whether to regenerate SSH key for the virtual machine. Possible values are <strong>true</strong> or <strong>false</strong>.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>timezone</strong>: The time zone for the virtual machine.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• <strong>root_password</strong>: The password for the admin user of the virtual machine.</td>
<td></td>
</tr>
<tr>
<td>Element</td>
<td>Type</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>--------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>custom_script</td>
<td></td>
<td>A custom script to run on the virtual machine when it starts.</td>
<td></td>
</tr>
<tr>
<td>input_locale</td>
<td></td>
<td>The locale for user input.</td>
<td></td>
</tr>
<tr>
<td>ui_language</td>
<td></td>
<td>The language used for user interface elements such as buttons and menus.</td>
<td></td>
</tr>
<tr>
<td>system_locale</td>
<td></td>
<td>The locale for the overall system.</td>
<td></td>
</tr>
<tr>
<td>user_locale</td>
<td></td>
<td>The locale for users.</td>
<td></td>
</tr>
<tr>
<td>active_directory_ou</td>
<td></td>
<td>The organizational unit in the Active Directory domain to which the virtual machine belongs.</td>
<td></td>
</tr>
<tr>
<td>org_name</td>
<td></td>
<td>The name of the organization to which the virtual machine belongs.</td>
<td></td>
</tr>
</tbody>
</table>

| payloads         | complex | Defines a set of payload elements to deliver content to a virtual machine upon boot. Each payload requires a type attribute, either cdrom or floppy, and a set of file elements. Within each file element is a name element that specifies the name and location of the file, and a content element that defines the content to deliver to the file. The payloads element is used by the cloud-init feature. When cloud-init is used to configure a virtual machine, a payload is automatically created with the type attribute set to cd-rom and two file sub-elements, openstack/latest/meta_data.json and openstack/latest/user_data, which pass configuration parameters to the virtual machine. |

The status contains one of the following enumerative values: unassigned, down, up, powering_up, powered_down, paused, migrating_from, migrating_to, unknown, not_responding, wait_for_launch, reboot_in_progress, saving_state, restoring_state, suspended, imageIllegal, image_locked or powering_down. These states are listed in vm_states under capabilities.

**15.2. XML REPRESENTATION OF A VIRTUAL MACHINE**

**Example 15.1. An XML representation of a virtual machine**

```xml
<vm id="70b4d9a7-4f73-4def-89ca-24fc5f60e01a"
    href="/api/vms/70b4d9a7-4f73-4def-89ca-24fc5f60e01a">
    <actions>
      <link rel="move"
            href="/api/vms/70b4d9a7-4f73-4def-89ca-24fc5f60e01a/move"/>
      <link rel="ticket"
            href="/api/vms/70b4d9a7-4f73-4def-89ca-24fc5f60e01a/ticket"/>
    </actions>
  </vm>
```
CHAPTER 15. VIRTUAL MACHINES

VM_01

Testing Virtual Machine
<type>server</type>
<status>
  <state>down</state>
</status>
<memory>1073741824</memory>
<cpu>
  <topology sockets="1" cores="1"/>
  <architecture>X86_64</architecture>
</cpu>
<cpu_shares>0</cpu_shares>
<bios>
  <boot_menu>
    <enabled>false</enabled>
  </boot_menu>
</bios>
<os type="other">
  <boot dev="hd"/>
</os>
<high_availability>
  <enabled>false</enabled>
  <priority>1</priority>
</high_availability>
<display>
  <type>spice</type>
  <monitors>1</monitors>
  <single_qxl_pci>false</single_qxl_pci>
  <allow_override>true</allow_override>
  <smartcard_enabled>false</smartcard_enabled>
  <file_transfer_enabled>true</file_transfer_enabled>
  <copy_paste_enabled>true</copy_paste_enabled>
</display>
<cluster href="/api/clusters/00000001-0001-0001-0001-0000000002fb" id="00000001-0001-0001-0001-0000000002fb"/>
<template href="/api/templates/00000000-0000-0000-0000-000000000000" id="00000000-0000-0000-0000-000000000000"/>
<stop_time>2014-12-03T14:25:45.588+10:00</stop_time>
<creation_time>2014-12-03T14:25:45.535+10:00</creation_time>
<origin>ovirt</origin>
<stateless>false</stateless>
<delete_protected>false</delete_protected>
<sso>
  <methods>
    <method id="GUEST_AGENT"/>
  </methods>
</sso>
<timezone>Etc/GMT</timezone>
<placement_policy>
  <affinity>migratable</affinity>
</placement_policy>
<memory_policy>
15.3. XML REPRESENTATION OF ADDITIONAL OVF DATA FOR A VIRTUAL MACHINE

Use a **GET** request for a virtual machine with the **All-Content: true** header to include additional OVF data with the representation of the virtual machine.

The **Accept** header defaults to **application/xml** if left blank, and the data is represented with HTML entities so as not to interfere with the XML tags. Specifying the **Accept: application/json** header will return the data in standard XML tagging. This example representation has been formatted from its standard block format to improve legibility.

**Example 15.2. XML representation of additional ovf data for a virtual machine**

```xml
GET /api/vms/70b4d9a7-4f73-4def-89ca-24fc5f60e01a HTTP/1.1
All-Content: true

<?xml version='1.0' encoding='UTF-8'?><ovf:Envelope xmlns:ovf="http://schemas.dmtf.org/ovf/envelope/1/"
xmlns:rasd="http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/CIM_ResourceAllocationSettingData"
xmlns:vssd="http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/CIM_VirtualSystemSettingData"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
ovf:version="3.5.0.0">
<References/>
<Section xsi:type="ovf:NetworkSection_Type">
  <Info>List of networks</Info>
  <Network ovf:name="Network 1"/>
</Section>
<Section xsi:type="ovf:DiskSection_Type">
  <Info>List of Virtual Disks</Info>
</Section>
<Content ovf:id="out" xsi:type="ovf:VirtualSystem_Type">
  <CreationDate>2014/12/03 04:25:45</CreationDate>
  <ExportDate>2015/02/09 14:12:24</ExportDate>
  <DeleteProtected>false</DeleteProtected>
  <SsoMethod>guest_agent</SsoMethod>
  <IsSmartcardEnabled>false</IsSmartcardEnabled>
  <TimeZone>Etc/GMT</TimeZone>
  <default_boot_sequence>0</default_boot_sequence>
  <Generation>1</Generation>
</Content>
</ovf:Envelope>
```
<VmType>1</VmType>
<MinAllocatedMem>1024</MinAllocatedMem>
<IsStateless>false</IsStateless>
<IsRunAndPause>false</IsRunAndPause>
<AutoStartup>false</AutoStartup>
<Priority>1</Priority>
<CreatedByUserId>fdfc627c-d875-11e0-90f0-83df133b58cc</CreatedByUserId>
<IsBootMenuEnabled>false</IsBootMenuEnabled>
<IsSpiceFileTransferEnabled>true</IsSpiceFileTransferEnabled>
<IsSpiceCopyPasteEnabled>true</IsSpiceCopyPasteEnabled>
>Name>VM_export</Name>
<TemplateId>00000000-0000-0000-0000-000000000000</TemplateId>
<TemplateName>Blank</TemplateName>
<IsInitilized>false</IsInitilized>
<Origin>3</Origin>
<DefaultDisplayType>1</DefaultDisplayType>
<TrustedService>false</TrustedService>
<OriginalTemplateId>00000000-0000-0000-0000-000000000000</OriginalTemplateId>
<OriginalTemplateName>Blank</OriginalTemplateName>
<UseLatestVersion>false</UseLatestVersion>
<Section ovf:id="70b4d9a7-4f73-4def-89ca-24fc5f60e01a" ovf:required="false" xsi:type="ovf:OperatingSystemSection_Type">
  <Info>Guest Operating System</Info>
  <Description>other</Description>
</Section>
<Section xsi:type="ovf:VirtualHardwareSection_Type">
  <Info>1 CPU, 1024 Memeory</Info>
  <System>
    <vssd:VirtualSystemType>ENGINE 3.5.0.0</vssd:VirtualSystemType>
  </System>
  <Item>
    <rasd:Caption>1 virtual cpu</rasd:Caption>
    <rasd:Description>Number of virtual CPU</rasd:Description>
    <rasd:InstanceId>1</rasd:InstanceId>
    <rasd:ResourceType>3</rasd:ResourceType>
    <rasd:num_of_sockets>1</rasd:num_of_sockets>
    <rasd:cpu_per_socket>1</rasd:cpu_per_socket>
  </Item>
  <Item>
    <rasd:Caption>1024 MB of memory</rasd:Caption>
    <rasd:Description>Memory Size</rasd:Description>
    <rasd:InstanceId>2</rasd:InstanceId>
    <rasd:ResourceType>4</rasd:ResourceType>
    <rasd:AllocationUnits>MegaBytes</rasd:AllocationUnits>
    <rasd:VirtualQuantity>1024</rasd:VirtualQuantity>
  </Item>
  <Item>
    <rasd:Caption>USB Controller</rasd:Caption>
    <rasd:InstanceId>3</rasd:InstanceId>
    <rasd:ResourceType>23</rasd:ResourceType>
    <rasd:UsbPolicy>DISABLED</rasd:UsbPolicy>
  </Item>
</Section>
15.4. JSON REPRESENTATION OF A VIRTUAL MACHINE

Example 15.3. A JSON representation of a virtual machine

```
{
    "type": "server",
    "status": {
        "state": "down"
    },
    "stop_reason": "",
    "memory": 1073741824,
    "cpu": {
        "topology": {
            "sockets": "1",
            "cores": "1"
        },
        "architecture": "X86_64"
    },
    "cpu_shares": "0",
    "bios": {
        "boot_menu": {
            "enabled": "false"
        }
    },
    "os": {
        "boot": [{
            "dev": "hd"
        }],
        "type": "other"
    },
    "high_availability": {
        "enabled": "false",
        "priority": "1"
    },
    "display": {
        "type": "spice",
        "monitors": "1",
        "single_xq1_pci": "false",
        "allow_override": "false",
        "smartcard_enabled": "false",
        "file_transfer_enabled": "true",
        "copy_paste_enabled": "true"
    },
    "cluster": {
        "href": "/api/clusters/00000001-0001-0001-0001-0000000002fb",
        "id": "00000001-0001-0001-0001-0000000002fb"
    },
    "template": {
        "href": "/api/templates/00000000-0000-0000-0000-000000000000",
        "id": "00000000-0000-0000-0000-000000000000"
    }
}```
"stop_time" : 1423550982110,
"creation_time" : 1423490033647,
"origin" : "ovirt",
"stateless" : "false",
"delete_protected" : "false",
"sso" : {
    "methods" : {
        "method" : [ {
            "id" : "GUEST_AGENT"
        } ]
    }
},
"timezone" : "Etc/GMT",
"initialization" : {
    "regenerate_ssh_keys" : "false",
    "nic_configurations" : {
    }
},
"placement_policy" : {
    "affinity" : "migratable"
},
"memory_policy" : {
    "guaranteed" : 1073741824,
    "ballooning" : "true"
},
"usb" : {
    "enabled" : "false"
},
"migration_downtime" : ":-1",
"cpu_profile" : {
    "href" : "/api/cpuprofiles/0000001a-001a-001a-001a-0000000002e3",
    "id" : "0000001a-001a-001a-001a-0000000002e3"
},
"next_run_configuration_exists" : "false",
"numa_tune_mode" : "interleave",
"actions" : {
    "link" : [ {
        "href" : "/api/vms/42ec2621-7ad6-4ca2-bd68-973a44b2562e/ticket",
        "rel" : "ticket"
    }, {
        "href" : "/api/vms/42ec2621-7ad6-4ca2-bd68-973a44b2562e/move",
        "rel" : "move"
    }, {
        "href" : "/api/vms/42ec2621-7ad6-4ca2-bd68-973a44b2562e/clone",
        "rel" : "clone"
    }, {
        "href" : "/api/vms/42ec2621-7ad6-4ca2-bd68-973a44b2562e/commit_snapshot",
        "rel" : "commit_snapshot"
    }, {
        "href" : "/api/vms/42ec2621-7ad6-4ca2-bd68-973a44b2562e/preview_snapshot",
        "rel" : "preview_snapshot"
    }, {
        "href" : "/api/vms/42ec2621-7ad6-4ca2-bd68-973a44b2562e/logon",
        "rel" : "logon"
15.5. METHODS

15.5.1. Creating a Virtual Machine

Creating a new virtual machine requires the name, template, and cluster elements. Identify the template and cluster elements with the id attribute or name element. Identify the CPU profile ID with the cpuprofiles attribute.

Example 15.4. Creating a virtual machine with 512 MB that boots from CD-ROM

POST /api/vms HTTP/1.1
Accept: application/xml
Content-type: application/xml

<vm>
  <name>vm2</name>
  <description>Virtual Machine 2</description>
  <type>desktop</type>
  <memory>536870912</memory>
  <cluster>
    <name>default</name>
  </cluster>
  <template>
    <name>Blank</name>
  </template>
  <os>
Example 15.5. Creating a virtual machine with 512 MB that boots from a virtual hard disk

POST /api/vms HTTP/1.1
Accept: application/xml
Content-type: application/xml

<vm>
  <name>vm2</name>
  <description>Virtual Machine 2</description>
  <type>desktop</type>
  <memory>536870912</memory>
  <cluster>
    <name>default</name>
  </cluster>
  <template>
    <name>Blank</name>
  </template>
  <os>
    <boot dev="hd"/>
  </os>
  <cpu_profile id="0000001a-001a-001a-001a-00000000035e"/>
</vm>

NOTE
Memory in the previous example is converted to bytes using the following formula:

\[512\text{MB} \times 1024^2 = 536870912\text{ bytes}\]

15.5.2. Updating a Virtual Machine

The name, description, cluster, type, memory, cpu, os, high_availability, display, timezone, domain, stateless, placement_policy, memory_policy, usb, payloads, origin and custom_properties elements are updatable post-creation.

Example 15.6. Updating a virtual machine to contain 1 GB of memory

PUT /api/vms/082c794b-771f-452f-83c9-b2b5a19c0399 HTTP/1.1
Accept: application/xml
Content-type: application/xml
NOTE
Memory in the previous example is converted to bytes using the following formula:

\[1024 \text{MB} \times 1024^2 = 1073741824 \text{ bytes}\]

NOTE
Memory hot plug is supported from Red Hat Enterprise Virtualization 3.6 onwards. You can use the example above to increase memory while the virtual machine is running.

Example 15.7. Hot plugging vCPUs

Add virtual CPUs to a running virtual machine without having to reboot it. In this example, the number of sockets is changed to 4.

```
PUT /api/vms/082c794b-771f-452f-83c9-b2b5a19c0399 HTTP/1.1
Accept: application/xml
Content-type: application/xml

<vm>
  <cpu>
    <topology>
      <sockets>4</sockets>
      <cores>2</cores>
      <threads>2</threads>
    </topology>
  </cpu>
</vm>
```

NOTE
CPU hot unplug is currently not supported in Red Hat Enterprise Virtualization.

Example 15.8. Pinning a virtual machine to multiple hosts

A virtual machine that is pinned to multiple hosts cannot be live migrated, but in the event of a host failure, any virtual machine configured to be highly available is automatically restarted on one of the other hosts to which the virtual machine is pinned. Multi-host pinning can be used to restrict a virtual machine to hosts with, for example, the same hardware configuration.

```
PUT /api/vms/082c794b-771f-452f-83c9-b2b5a19c0399 HTTP/1.1
Accept: application/xml
Content-type: application/xml

<vm>
```
15.5.3. Removing a Virtual Machine

Removal of a virtual machine requires a DELETE request.

**Example 15.9. Removing a virtual machine**

```
DELETE /api/vms/082c794b-771f-452f-83c9-b2b5a19c0399 HTTP/1.1
HTTP/1.1 204 No Content
```

15.5.4. Removing a Virtual Machine but not the Virtual Disk

Detach the virtual disk prior to removing the virtual machine. This preserves the virtual disk. Removal of a virtual machine requires a DELETE request.

**Example 15.10. Removing a virtual machine**

```
DELETE /api/vms/082c794b-771f-452f-83c9-b2b5a19c0399 HTTP/1.1
Accept: application/xml
Content-type: application/xml

<action>
  <vm>
    <disks>
      <detach_only>true</detach_only>
    </disks>
  </vm>
</action>
```

15.6. SUB-COLLECTIONS

15.6.1. Disks Sub-Collection

15.6.1.1. Disks Sub-Collection
The **disks** sub-collection represents all virtual hard disk devices on a virtual machine. A disk representation contains the following elements:

**Table 15.2. Elements for virtual machine disks**

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>link</td>
<td>relationship</td>
<td>A link to the <code>statistics</code> sub-collection for a virtual machine's disk statistics.</td>
<td></td>
</tr>
<tr>
<td>link</td>
<td>relationship</td>
<td>A link to the <code>permissions</code> sub-collection.</td>
<td>[a]</td>
</tr>
<tr>
<td>alias</td>
<td>string</td>
<td>The unique identifier for the disk. Use <code>alias</code> instead of <code>name</code>.</td>
<td></td>
</tr>
<tr>
<td>image_id</td>
<td>string</td>
<td>A reference to the virtual machine image stored on the defined storage domain.</td>
<td></td>
</tr>
<tr>
<td>storage_domains</td>
<td>complex</td>
<td>The storage domains associated with this disk. Each <code>storage_domain</code> element contains an <code>id</code> attribute with the associated storage domain's GUID. Update this element with POST to perform live migration of a disk from one data storage domain to another.</td>
<td>[a]</td>
</tr>
<tr>
<td>size</td>
<td>integer</td>
<td>Size of the disk in bytes. Deprecated; replaced by <code>provisioned_size</code>.</td>
<td>[a]</td>
</tr>
<tr>
<td>provisioned_size</td>
<td>integer</td>
<td>The provisioned size of the disk in bytes.</td>
<td>[a]</td>
</tr>
<tr>
<td>actual_size</td>
<td>integer</td>
<td>Actual size of the disk in bytes.</td>
<td></td>
</tr>
<tr>
<td>status</td>
<td></td>
<td>The status of the disk device. These states are listed in <code>disk_states</code> under <code>capabilities</code>.</td>
<td>[a]</td>
</tr>
<tr>
<td>interface</td>
<td>enumerated</td>
<td>The type of interface driver used to connect to the disk device. A list of enumerated values is available in <code>capabilities</code>.</td>
<td>[a]</td>
</tr>
<tr>
<td>Element</td>
<td>Type</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>--------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>format</td>
<td>enumerated</td>
<td>The underlying storage format. A list of enumerated values is available in <strong>capabilities</strong>. Copy On Write (COW) allows snapshots, with a small performance overhead. Raw does not allow snapshots, but offers improved performance.</td>
<td></td>
</tr>
<tr>
<td>sparse</td>
<td>Boolean: true or false</td>
<td><strong>true</strong> if the physical storage for the disk should not be preallocated.</td>
<td></td>
</tr>
<tr>
<td>bootable</td>
<td>Boolean: true or false</td>
<td><strong>true</strong> if this disk is to be marked as bootable.</td>
<td></td>
</tr>
<tr>
<td>shareable</td>
<td>Boolean: true or false</td>
<td><strong>true</strong> to share the disk with multiple virtual machines.</td>
<td></td>
</tr>
<tr>
<td>wipe_after_delete</td>
<td>Boolean: true or false</td>
<td><strong>true</strong> if the underlying physical storage for the disk should be zeroed when the disk is deleted. This increases security but is a more intensive operation and may prolong delete times.</td>
<td></td>
</tr>
<tr>
<td>propagate_errors</td>
<td>Boolean: true or false</td>
<td><strong>true</strong> if disk errors should not cause virtual machine to be paused and, instead, disk errors should be propagated to the guest OS.</td>
<td></td>
</tr>
<tr>
<td>vm_id=</td>
<td>GUID</td>
<td>The ID of the containing virtual machine.</td>
<td></td>
</tr>
<tr>
<td>quota_id=</td>
<td>GUID</td>
<td>Sets a quota for the disk.</td>
<td></td>
</tr>
<tr>
<td>lun_storage</td>
<td>complex</td>
<td>A reference to a direct LUN mapping for storage usage. Requires a <strong>logical_unit</strong> element that contains iSCSI or FCP device details.</td>
<td></td>
</tr>
<tr>
<td>active</td>
<td>Boolean</td>
<td>Defines if the disk is connected to the virtual machine.</td>
<td></td>
</tr>
<tr>
<td>read_only</td>
<td>Boolean</td>
<td>Defines if the disk is read-only.</td>
<td></td>
</tr>
<tr>
<td>link rel=&quot;disk_profile&quot;</td>
<td>relationship</td>
<td>A link to the <strong>disk_profile</strong> sub-collection.</td>
<td></td>
</tr>
</tbody>
</table>
Add a new virtual disk. When adding a new internal disk, the **provisioned_size** element is required. Use the **storage_domains** element to specify in which storage domain the disk will be created. Multiple disks for the same virtual machine can reside in different storage domains.
Example 15.12. Creating a new disk device on a virtual machine

POST /api/vms/082c794b-771f-452f-83c9-b2b5a19c0399/disks HTTP/1.1
Accept: application/xml
Content-type: application/xml

<disk>
  <storage_domains>
    <storage_domain id="fabe0451-701f-4235-8f7e-e20e458819ed"/>
  </storage_domains>
  <provisioned_size>8589934592</provisioned_size>
  <type>system</type>
  <interface>virtio</interface>
  <format>cow</format>
  <bootable>true</bootable>
</disk>

Add a new external (direct LUN) disk to a virtual machine. This method requires the lun_storage element and the logical_unit element, which contains iSCSI or FCP device details.

Example 15.13. Creating a new direct LUN disk device on a virtual machine

POST /api/vms/082c794b-771f-452f-83c9-b2b5a19c0399/disks HTTP/1.1
Accept: application/xml
Content-type: application/xml

<disk>
  <interface>virtio</interface>
  <lun_storage>
    <type>iscsi</type>
    <logical_unit id="lun1">
      <address>iscsi.example.com</address>
      <port>3260</port>
      <target>iqn.2010.05.com.example:iscsi.targetX</target>
    </logical_unit>
  </lun_storage>
</disk>

The alias, description, storage_domains, provisioned_size, interface, bootable, shareable, wipe_after_delete and propagate_errors elements are updatable post-creation.

Users can resize virtual disks that are in use by one or more virtual machines, without pausing, hibernating or rebooting the virtual machine(s).

Example 15.14. Updating a virtual machine disk

PUT /api/vms/cdc0b102-fbfe-444a-b9cb-57d2af94f401/disks/ed7feafe-9aaf-458c-809a-ed789cddbd5b4 HTTP/1.1
Accept: application/xml
Content-type: application/xml

<disk>
Example 15.15. Updating a virtual machine disk to 20GB

```
PUT /api/vms/cdc0b102-fbfe-444a-b9cb-57d2af94f401/disks/ed7feafe-9aaf-458c-809a-ed789cdbd5b4 HTTP/1.1
Accept: application/xml
Content-type: application/xml

<disk>
  <provisioned_size>21474836480</provisioned_size>
</disk>
```

**NOTE**

Disk size in the previous example is converted to bytes using the following formula:

\[20480 \text{MB} \times 1024^2 = 21474836480 \text{ bytes}\]

Example 15.16. Renaming a virtual machine disk

```
PUT /api/vms/cdc0b102-fbfe-444a-b9cb-57d2af94f401/disks/ed7feafe-9aaf-458c-809a-ed789cdbd5b4 HTTP/1.1
Accept: application/xml
Content-type: application/xml

<disk>
  <alias>Classic_VM2</alias>
</disk>
```

Removal of a virtual machine disk requires a **DELETE** request.

Example 15.17. Removing a virtual machine disk

```
DELETE /api/vms/cdc0b102-fbfe-444a-b9cb-57d2af94f401/disks/ed7feafe-9aaf-458c-809a-ed789cdbd5b4 HTTP/1.1

HTTP/1.1 204 No Content
```

15.6.1.2. Disk Cloning

Clone a disk from a template with the **clone** element. Set the **clone** element to **true** within the **disks** sub-collection when creating a virtual machine. This clones a disk from the base template and attaches it to the virtual machine.
Example 15.18. Cloning a disk from a template

The following example clones a disk from a template during the creation of a virtual machine.

```
POST /api/vms/082c794b-771f-452f-83c9-b2b5a19c0399 HTTP/1.1
Accept: application/xml
Content-type: application/xml

<vm>
  <name>cloned_vm</name>
  <template id="64d4aa08-58c6-4de2-abc4-89f19003b886"/>
  <cluster id="99408929-82cf-4dc7-a532-9d98063fa95"/>
  <disks>
    <clone>true</clone>
    <disk id="4825ffda-a997-4e96-ae27-5503f1851d1b">
      <format>COW</format>
    </disk>
    <disk id="42aef10d-3dd5-4704-aa73-56a023c1464c">
      <format>COW</format>
    </disk>
  </disks>
</vm>
```

**IMPORTANT**

Search queries for virtual machine disks based upon disk name require the `alias` search parameter instead of `name`.

15.6.1.3. Disk Statistics Sub-Collection

Each virtual machine's disk exposes a `statistics` sub-collection for disk-specific statistics. Each `statistic` contains the following elements:

**Table 15.3. Elements for virtual machine disk statistics**

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>string</td>
<td>The unique identifier for the statistic entry.</td>
</tr>
<tr>
<td>description</td>
<td>string</td>
<td>A plain text description of the statistic.</td>
</tr>
<tr>
<td>unit</td>
<td>string</td>
<td>The unit or rate to measure the statistical values.</td>
</tr>
<tr>
<td>type</td>
<td>One of GAUGE or COUNTER</td>
<td>The type of statistic measures.</td>
</tr>
<tr>
<td>values type</td>
<td>One of INTEGER or DECIMAL</td>
<td>The data type for the statistical values that follow.</td>
</tr>
<tr>
<td>value</td>
<td>complex</td>
<td>A data set that contains datum.</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>datum</td>
<td>see values type</td>
<td>An individual piece of data from a value.</td>
</tr>
<tr>
<td>disk id=</td>
<td>relationship</td>
<td>A relationship to the containing disk resource.</td>
</tr>
</tbody>
</table>

The following table lists the statistic types for virtual machine disks.

### Table 15.4. Virtual machine disk statistic types

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>data.current.read</td>
<td>The data transfer rate in bytes per second when reading from the disk.</td>
</tr>
<tr>
<td>data.current.write</td>
<td>The data transfer rate in bytes per second when writing to the disk.</td>
</tr>
</tbody>
</table>

#### Example 15.19. An XML representation of a virtual machine’s statistics sub-collection

```xml
<statistics>
  <statistic id="33b9212b-f9cb-3fd0-b364-248fb61e1272"
    href="/api/vms/3a42530e-3bc5-4094-829d-489257894c2a/disks/f28ec14c-fc85-43e1-818d-96b49d50e27b/statistics/
    33b9212b-f9cb-3fd0-b364-248fb61e1272">
    <name>data.current.read</name>
    <description>Read data rate</description>
    <values type="DECIMAL">
      <value>
        <datum>0</datum>
      </value>
    </values>
    <type>GAUGE</type>
    <unit>BYTES_PER_SECOND</unit>
    <disk id="f28ec14c-fc85-43e1-818d-96b49d50e27b"
      href="/api/vms/3a42530e-3bc5-4094-829d-489257894c2a/disks/f28ec14c-fc85-43e1-818d-96b49d50e27b"/>
  </statistic>
  ...
</statistics>
```

#### NOTE

This statistics sub-collection is read-only.

### 15.6.1.4. Floating Disk Attach and Detach Actions

Attach a disk from the main rel="disks" collection using a POST request on the virtual machine’s disks sub-collection. Include the id of the disk to attach.
Example 15.20. Attach a floating disk

POST /api/vms/082c794b-771f-452f-83c9-b2b5a19c0399/disks HTTP/1.1
Accept: application/xml
Content-type: application/xml

<disk id="d135f1c5-b5e1-4238-9381-b3277f5a3742">
</disk>

Detach a disk from a virtual machine's disks sub-collection using a DELETE request on the disk resource but ensure to include a detach Boolean element so the disk is not destroyed.

Example 15.21. Detach a disk from a virtual machine

DELETE /api/vms/082c794b-771f-452f-83c9-b2b5a19c0399/disks/
d135f1c5-b5e1-4238-9381-b3277f5a3742 HTTP/1.1
Accept: application/xml
Content-type: application/xml

<action>
  <detach>true</detach>
</action>

15.6.1.5. Disk Activate and Deactivate Actions

Each virtual machine's disk provides a set of activate and deactivate actions to add and remove disks from a virtual machine.

Example 15.22. Action to activate a virtual machine disk

POST /api/vms/082c794b-771f-452f-83c9-b2b5a19c0399/disks/a42ada0e-1d69-410d-a392-a6980d873e5d/activate HTTP/1.1
Accept: application/xml
Content-type: application/xml

<action/>

Example 15.23. Action to deactivate a virtual machine disk

POST /api/vms/082c794b-771f-452f-83c9-b2b5a19c0399/disks/a42ada0e-1d69-410d-a392-a6980d873e5d/deactivate HTTP/1.1
Accept: application/xml
Content-type: application/xml

<action/>

Use these actions to hotplug disks to virtual machines and activate newly attached floating disks.
The hotplugging feature only supports VirtIO disks and virtual machine operating systems that support hotplugging operations. Example operating systems include:

- Red Hat Enterprise Linux 6;
- Red Hat Enterprise Linux 5;
- Windows Server 2008; and,

15.6.2. Network Interfaces Sub-Collection

15.6.2.1. Network Interfaces Sub-Collection

The nics sub-collection represents all network interface devices on a virtual machine. An nic representation contains the following elements:

Table 15.5. Elements for virtual machine network interfaces

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>link</td>
<td>relationship</td>
<td>A link to the statistics sub-collection for a virtual machine’s network interface statistics.</td>
<td></td>
</tr>
<tr>
<td>network id=</td>
<td>GUID</td>
<td>A reference to the network which the interface should be connected. A blank network id is allowed.</td>
<td>![WARNING]</td>
</tr>
<tr>
<td>interface</td>
<td>enumerated</td>
<td>The type of driver used for the nic. A list of enumerated values is available in capabilities.</td>
<td></td>
</tr>
<tr>
<td>mac address=</td>
<td>string</td>
<td>The MAC address of the interface.</td>
<td>![Mandatory]</td>
</tr>
<tr>
<td>port_mirroring</td>
<td>complex</td>
<td>Defines whether the NIC receives mirrored traffic. Define a networks element with a series of network id= references.</td>
<td></td>
</tr>
<tr>
<td>plugged</td>
<td>Boolean</td>
<td>Defines if the NIC is plugged in to the virtual machine.</td>
<td>![Mandatory]</td>
</tr>
<tr>
<td>linked</td>
<td>Boolean</td>
<td>Defines if the NIC is linked to the virtual machine.</td>
<td>![Mandatory]</td>
</tr>
</tbody>
</table>

Example 15.24. An XML representation of a network interface
When adding a new network interface, the name and network elements are required. Identify the network element with the id attribute or name element.

**Example 15.25. Creating a virtual machine NIC**

```xml
POST /api/vms/cdc0b102-fbfe-444a-b9cb-57d2af94f401/nics HTTP/1.1
Accept: application/xml
Content-type: application/xml

<nic>
  <name>nic1</name>
  <network id="00000000-0000-0000-0000-000000000009"/>
</nic>
```

An API user modifies a network interface with a **PUT** request.

**Example 15.26. Updating a virtual machine NIC**

```xml
PUT /api/vms/cdc0b102-fbfe-444a-b9cb-57d2af94f401/nics/7a3cffe5e-3cc4-47c2-8388-9adf16341f5e HTTP/1.1
Accept: application/xml
Content-type: application/xml

<nic>
  <name>nic2</name>
  <network id="00000000-0000-0000-0000-000000000010"/>
  <type>e1000</type>
</nic>
```
An API user removes a network interface with a `DELETE` request.

**Example 15.27. Deleting a virtual machine NIC**

```
DELETE /api/vms/cdc0b102-fbfe-444a-b9cb-57d2af94f401/nics/7a3cff5e-3cc4-47c2-8388-9adf16341f5e HTTP/1.1
```

HTTP/1.1 204 No Content

**IMPORTANT**

The hotplugging feature only supports virtual machine operating systems with hotplugging operations. Example operating systems include:

- Red Hat Enterprise Linux 6;
- Red Hat Enterprise Linux 5;
- Windows Server 2008; and,

### 15.6.2.2. Network Interface Statistics Sub-Collection

Each virtual machine's network interface exposes a statistics sub-collection for network interface statistics. Each statistic contains the following elements:

**Table 15.6. Elements for a virtual machine's network interface statistics**

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>string</td>
<td>The unique identifier for the statistic entry.</td>
</tr>
<tr>
<td>description</td>
<td>string</td>
<td>A plain text description of the statistic.</td>
</tr>
<tr>
<td>unit</td>
<td>string</td>
<td>The unit or rate to measure the statistical values.</td>
</tr>
<tr>
<td>type</td>
<td>One of <code>GAUGE</code> or <code>COUNTER</code></td>
<td>The type of statistic measures.</td>
</tr>
<tr>
<td>values type=</td>
<td>One of <code>INTEGER</code> or <code>DECIMAL</code></td>
<td>The data type for the statistical values that follow.</td>
</tr>
<tr>
<td>value</td>
<td>complex</td>
<td>A data set that contains datum.</td>
</tr>
<tr>
<td>datum</td>
<td>see values type</td>
<td>An individual piece of data from a value.</td>
</tr>
<tr>
<td>nic id=</td>
<td>relationship</td>
<td>A relationship to the containing nic resource.</td>
</tr>
</tbody>
</table>
The following table lists the statistic types for network interfaces on virtual machines.

### Table 15.7. Virtual machine NIC statistic types

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>data.current.rx</td>
<td>The rate in bytes per second of data received.</td>
</tr>
<tr>
<td>data.current.tx</td>
<td>The rate in bytes per second of data transmitted.</td>
</tr>
<tr>
<td>errors.total.rx</td>
<td>Total errors from receiving data.</td>
</tr>
<tr>
<td>errors.total.tx</td>
<td>Total errors from transmitting data.</td>
</tr>
</tbody>
</table>

#### Example 15.28. An XML representation of a virtual machine's NIC statistics sub-collection

```xml
<statistics>
  <statistic id="ecd0559f-e88f-3330-94b4-1f091b0ffdf7" href="/api/vms/3a42530e-3bc5-4094-829d-489257894c2a/nics/6cd08e76-57c0-41ba-a728-7eba46ae1e36/statistics/ecd0559f-e88f-3330-94b4-1f091b0ffdf7">
    <name>data.current.rx</name>
    <description>Receive data rate</description>
    <values type="DECIMAL">
      <value>
        <datum>0</datum>
      </value>
    </values>
    <type>GAUGE</type>
    <unit>BYTES_PER_SECOND</unit>
    <nic id="6cd08e76-57c0-41ba-a728-7eba46ae1e36" href="/api/vms/3a42530e-3bc5-4094-829d-489257894c2a/nics/6cd08e76-57c0-41ba-a728-7eba46ae1e36"/>
  </statistic>
  ...
</statistics>
```

#### NOTE

This **statistics** sub-collection is read-only.

### 15.6.3. Virtual NUMA Nodes Sub-Collection

The **numanodes** sub-collection represents all virtual NUMA nodes on a virtual machine. A **vm_numa_node** representation contains the following elements:

#### Table 15.8. Elements for virtual NUMA nodes
<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>index</td>
<td>integer</td>
<td>The index number of the virtual NUMA node.</td>
<td></td>
</tr>
<tr>
<td>memory</td>
<td>integer</td>
<td>The amount of memory allocated to the virtual NUMA node, in MB.</td>
<td></td>
</tr>
<tr>
<td>cpu</td>
<td>complex</td>
<td>The CPU topology associated with this virtual NUMA node. Each core element contains an index attribute with the associated core's index number.</td>
<td></td>
</tr>
<tr>
<td>vm id=</td>
<td>GUID</td>
<td>The ID of the containing virtual machine.</td>
<td></td>
</tr>
<tr>
<td>numa_node_pins</td>
<td>complex</td>
<td>Pins the virtual NUMA node to a host NUMA node. Each numa_node_pin element contains a pinned=&quot;true&quot; boolean and the host NUMA node's index number.</td>
<td></td>
</tr>
</tbody>
</table>

**Example 15.29. An XML representation of a virtual NUMA node**

```xml
<vm_numa_node href="/api/vms/c7ecd2dc-dbdc-3419-956f-124961c0f2b/numanodes/3290b973-ed3e-4f0b-bbf5-9be10d229e50" id="3290b973-ed3e-4f0b-bbf5-9be10d229e50">
  <index>0</index>
  <memory>1024</memory>
  <cpu>
    <cores>
      <core index="0"/>
    </cores>
  </cpu>
</vm_numa_node>
```

**Example 15.30. Adding a new virtual NUMA node to a virtual machine**

When adding a new virtual NUMA node, the index, memory, and cpu elements are required.
Update a virtual NUMA node with a **PUT** request. You can use a **PUT** request to pin a virtual NUMA node to a physical NUMA node on a host.

**Example 15.31. Updating a virtual NUMA node**

```xml
PUT /api/vms/c7ecd2dc-dbd3-4419-956f-1249651c0f2b/numanodes/3290b973-ed3e-4f0b-bbf5-9be10d229e50 HTTP/1.1
Accept: application/xml
Content-type: application/xml

<vm_numa_node>
  <numa_node_pins>
    <numa_node_pin pinned="true" index="0">
      <host_numa_node id="417cdefb-8c47-4838-87f3-dd0498fdf6c7"/>
    </numa_node_pin>
  </numa_node_pins>
</vm_numa_node>
```

Remove a virtual NUMA node with a **DELETE** request.

**Example 15.32. Removing a virtual NUMA node**

```bash
DELETE /api/vms/c7ecd2dc-dbd3-4419-956f-1249651c0f2b/numanodes/3290b973-ed3e-4f0b-bbf5-9be10d229e50 HTTP/1.1
HTTP/1.1 204 No Content
```

**15.6.4. CD-ROMs Sub-Collection**

The **cdroms** sub-collection represents the CD-ROM device on a virtual machine. A **cdrom** representation contains the following elements:

**Table 15.9. Elements for virtual machine CD-ROMs**
<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>file id=</td>
<td>string/filename</td>
<td>A reference to an ISO image.</td>
<td></td>
</tr>
</tbody>
</table>

**Example 15.33. An XML representation of a CD-ROM device**

```
<cdrom id="00000000-0000-0000-0000-000000000000"
href="/api/vms/cdc0b102-fbfe-444a-b9cb-57d2af94f401/cdroms/
00000000-0000-0000-0000-000000000000">
 <file id="rhel-server-6.0-x86_64-dvd.iso"/>
 <vm id="cdc0b102-fbfe-444a-b9cb-57d2af94f401"
href="/api/vms/cdc0b102-fbfe-444a-b9cb-57d2af94f401"/>
</cdrom>
```

Send a PUT request with a file id element to add a new CD-ROM resource.

**Example 15.34. Adding a new CD-ROM file**

```
PUT /api/vms/cdc0b102-fbfe-444a-b9cb-57d2af94f401/cdroms/00000000-0000-
0000-0000-000000000000 HTTP/1.1
Accept: application/xml
Content-type: application/xml

<cdrom>
 <file id="fedora-15-x86_64-dvd.iso"/>
</cdrom>
```

The API changes the CD-ROM using a PUT request:

**Example 15.35. Changing a CD-ROM file**

```
PUT /api/vms/cdc0b102-fbfe-444a-b9cb-57d2af94f401/cdroms/00000000-0000-
0000-0000-000000000000 HTTP/1.1
Accept: application/xml
Content-type: application/xml

<cdrom>
 <file id="fedora-15-x86_64-dvd.iso"/>
</cdrom>
```

The API changes the CD-ROM for the current session only using a PUT request with an additional current URI argument:

**Example 15.36. Changing a CD-ROM file during a current session**

```
PUT /api/vms/cdc0b102-fbfe-444a-b9cb-57d2af94f401/cdroms/00000000-0000-
0000-0000-000000000000;current=true HTTP/1.1
Accept: application/xml
```

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To eject the CD-ROM temporarily, send a **PUT** request to the `cdroms` sub-collection of a virtual machine, adding the `current=true` matrix parameter:

**Example 15.37. Ejecting a CD-ROM file during a current session**

```
PUT /api/vms/cdc0b102-fbfe-444a-b9cb-57d2af94f401/cdroms/00000000-0000-0000-0000-000000000000;current=true HTTP/1.1
Accept: application/xml
Content-type: application/xml
<cdrom>
   <file id=""/>
</cdrom>
```

**NOTE**

Rebooting the virtual machine will connect the CD-ROM again.

To eject the CD-ROM permanently, send a **PUT** request to the `cdroms` sub-collection of a virtual machine:

**Example 15.38. Ejecting a CD-ROM file permanently**

```
PUT /api/vms/cdc0b102-fbfe-444a-b9cb-57d2af94f401/cdroms/00000000-0000-0000-0000-000000000000 HTTP/1.1
Accept: application/xml
Content-type: application/xml
<cdrom>
   <file id=""/>
</cdrom>
```

**NOTE**

Virtual machines only contain a single CD-ROM device.

### 15.6.5. Snapshots Sub-Collection

#### 15.6.5.1. Snapshots Sub-Collection

A virtual machine saves and restores disk state as a number of snapshots. These are represented and managed through a `rel="snapshot"` sub-collection that behaves similar to other collections.
Each virtual machine snapshot is represented with an individual **snapshot** element that contains the following sub-elements:

**Table 15.10. Elements for virtual machine snapshots**

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>vm id</strong></td>
<td>GUID</td>
<td>The ID and URI of the virtual machine to which this snapshot pertains.</td>
<td></td>
</tr>
<tr>
<td><strong>link rel=&quot;restore&quot;</strong></td>
<td>relationship</td>
<td>A link to restore the snapshot of the virtual machine.</td>
<td></td>
</tr>
<tr>
<td><strong>link rel=&quot;prev&quot;</strong></td>
<td>relationship</td>
<td>A link to the previous snapshot of this virtual machine.</td>
<td></td>
</tr>
<tr>
<td><strong>type</strong></td>
<td>string</td>
<td>The type of the snapshot. For example, <strong>active</strong> or <strong>regular</strong>.</td>
<td></td>
</tr>
<tr>
<td><strong>date</strong></td>
<td>xsd:dateTime format: YYYY-MM-DDThh:mm:ss</td>
<td>The date and time at which the snapshot was created.</td>
<td></td>
</tr>
<tr>
<td><strong>snapshot_status</strong></td>
<td>string</td>
<td>The current status of the snapshot.</td>
<td></td>
</tr>
<tr>
<td><strong>persist_memorystate</strong></td>
<td>Boolean</td>
<td>Defines whether the snapshot also includes the state of the memory of the virtual machine at the time the snapshot was taken.</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE**

It is not possible to modify snapshot elements using **PUT**.

**Example 15.39. An XML representation of a virtual machine snapshot**

```xml
<snapshot id="00000000-0000-0000-0000-000000000000" href="/api/vms/00000000-0000-0000-0000-000000000000/snapshots/00000000-0000-0000-0000-000000000000"
<actions>
    <link rel="restore" href="/api/vms/00000000-0000-0000-0000-000000000000/snapshots/00000000-0000-0000-0000-000000000000/restore"/>
    <link rel="prev" href="/api/vms/00000000-0000-0000-0000-000000000000/snapshots/00000000-0000-0000-0000-000000000000"/>
</actions>
<vm id="00000000-0000-0000-0000-000000000000" href="/api/vms/00000000-0000-0000-0000-000000000000"
<description>Virtual Machine 1 - Snapshot A</description>
<type>active</type>
```
Use a **GET** request for a virtual machine snapshot with the **All-Content: true** header to include additional OVF data with the representation of the snapshot.

The **Accept** header defaults to application/xml if left blank, and the data is represented with HTML entities so as not to interfere with the XML tags. Specifying the **Accept: application/json** header will return the data in standard XML tagging. This example representation has been formatted from its standard block format to improve legibility.

**Example 15.40. XML representation of additional ovf data for a snapshot**

```
GET /api/vms/42ec2621-7ad6-4ca2-bd68-973a44b2562e/snapshots HTTP/1.1
All-Content: true

<?xml version='1.0' encoding='UTF-8'?>
<ovf:Envelope xmlns:ovf="http://schemas.dmtf.org/ovf/envelope/1/"
 xmlns:rasd="http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/CIM_ResourceAllocationSettingData"
 xmlns:vssd="http://schemas.dmtf.org/wbem/wscim/1/cim-schema/2/CIM_VirtualSystemSettingData"
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 ovf:version="3.5.0.0">
<References>
  <File ovf:href="ad353554-f668-46cf-aa3c-e57383de2c92/40456d92-3687-4a85-bab3-87b4cc7af459"
    ovf:id="40456d92-3687-4a85-bab3-87b4cc7af459"
    ovf:size="10737418240"
    ovf:description="Active VM"/>
  <Nic ovf:id="be14bfc8-3dbd-4ac1-ba02-c6d6a77707c"/>
</References>
<Section xsi:type="ovf:NetworkSection_Type">
  <Info>List of networks</Info><Network ovf:name="Network 1"/>
</Section>
<Section xsi:type="ovf:DiskSection_Type">
  <Info>List of Virtual Disks</Info><Disk ovf:diskId="40456d92-3687-4a85-bab3-87b4cc7af459"
    ovf:size="10" ovf:actual_size="0"
    ovf:vm_snapshot_id="a209216d-2909-4802-8886-02aad55dccc8"
    ovf:parentRef=""
    ovf:fileRef="ad353554-f668-46cf-aa3c-e57383de2c92/40456d92-3687-4a85-bab3-87b4cc7af459"
    ovf:format="http://www.vmware.com/specifications/vmdk.html#sparse"
    ovf:volume-format="RAW"
    ovf:volume-type="Preallocated"
    ovf:disk-interface="VirtIO"
    ovf:boot="true"
    ovf:disk-alias="VM_01_Disk1"
    ovf:wipe-after-delete="false"/>
</Section>
```
<Content
  ovf:id="out"
xsi:type="ovf:VirtualSystem_Type">
  <CreationDate>2015/02/09 13:53:53</CreationDate>
  <ExportDate>2015/02/10 00:39:24</ExportDate>
  <DeleteProtected>false</DeleteProtected>
  <SsoMethod>guest_agent</SsoMethod>
  <IsSmartcardEnabled>false</IsSmartcardEnabled>
  <TimeZone>Etc/GMT</TimeZone>
  <default_boot_sequence>0</default_boot_sequence>
  <Generation>1</Generation>
  <VmType>1</VmType>
  <MinAllocatedMem>1024</MinAllocatedMem>
  <IsStateless>false</IsStateless>
  <IsRunAndPause>false</IsRunAndPause>
  <AutoStartup>false</AutoStartup>
  <Priority>1</Priority>
  <CreatedByUserId>fdfc627c-d875-11e0-90f0-83df13b58cc</CreatedByUserId>
  <IsBootMenuEnabled>false</IsBootMenuEnabled>
  <IsSpiceFileTransferEnabled>true</IsSpiceFileTransferEnabled>
  <IsSpiceCopyPasteEnabled>true</IsSpiceCopyPasteEnabled>
  <Name>VM_01</Name>
  <TemplateId>00000000-0000-0000-0000-000000000000</TemplateId>
  <TemplateName>Blank</TemplateName>
  <IsInitialized>true</IsInitialized>
  <Origin>3</Origin>
  <DefaultDisplayType>1</DefaultDisplayType>
  <TrustedService>false</TrustedService>
  <OriginalTemplateId>00000000-0000-0000-0000-000000000000</OriginalTemplateId>
  <OriginalTemplateName>Blank</TemplateName>
  <UseLatestVersion>false</UseLatestVersion>
</Content>
<Item>
    <rasd:Caption>VM_01_Disk1</rasd:Caption>
    <rasd:InstanceId>40456d92-3687-4a85-bab3-87b4cc7af459</rasd:InstanceId>
    <rasd:ResourceType>17</rasd:ResourceType>
    <rasd:HostResource>ad353554-f668-46cf-aa3c-e57383de2c92/40456d92-3687-4a85-bab3-87b4cc7af459</rasd:HostResource>
    <rasd:Parent>00000000-0000-0000-0000-000000000000</rasd:Parent>
    <rasd:Template>00000000-0000-0000-0000-000000000000</rasd:Template>
    <rasd:StoragePoolId>00000002-0002-0002-0002-000000000255</rasd:StoragePoolId>
    <rasd:CreationDate>2015/02/09 13:54:41</rasd:CreationDate>
    <rasd:LastModified>1970/01/01 00:00:00</rasd:LastModified>
    <rasd:last_modified_date>2015/02/10 00:39:22</rasd:last_modified_date>
    <Type>disk</Type>
    <Device>disk</Device>
    <rasd:Address>{slot=0x06, bus=0x00, domain=0x0000, type=pci, function=0x0}</rasd:Address>
    <BootOrder>1</BootOrder>
    <IsPlugged>true</IsPlugged>
    <IsReadOnly>false</IsReadOnly>
    <Alias>virtio-disk0</Alias>
</Item>

<Item>
    <rasd:Caption>Ethernet adapter on ovirtmgmt</rasd:Caption>
    <rasd:InstanceId>be14bfc8-3dbd-4ac1-ba02-c6d77fa7707c</rasd:InstanceId>
    <rasd:ResourceType>10</rasd:ResourceType>
    <rasd:OtherResourceType>ovirtmgmt</rasd:OtherResourceType>
    <rasd:ResourceSubType>3</rasd:ResourceSubType>
    <rasd:Connection>ovirtmgmt</rasd:Connection>
    <rasd:Linked>true</rasd:Linked>
    <rasd:Name>nic1</rasd:Name>
    <rasd:MACAddress>00:1a:4a:87:cb:00</rasd:MACAddress>
    <rasd:speed>1000</rasd:speed>
    <Type>interface</Type>
    <Device>bridge</Device>
    <rasd:Address>{slot=0x03, bus=0x00, domain=0x0000, type=pci, function=0x0}</rasd:Address>
    <BootOrder>0</BootOrder>
    <IsPlugged>true</IsPlugged>
    <IsReadOnly>false</IsReadOnly>
    <Alias>net0</Alias>
</Item>

<Item>
    <rasd:Caption>USB Controller</rasd:Caption>
    <rasd:InstanceId>3</rasd:InstanceId>
    <rasd:ResourceType>23</rasd:ResourceType>
    <rasd:UsbPolicy>DISABLED</rasd:UsbPolicy>
</Item>
<Item>
    <rasd:Caption>Graphical Controller</rasd:Caption>
    <rasd:InstanceId>17bbf0db-7cf0-4529-9b53-dee6dee41cfd</rasd:InstanceId>
    <rasd:ResourceType>20</rasd:ResourceType>
    <rasd:VirtualQuantity>1</rasd:VirtualQuantity>
    <rasd:SinglePciQxl>false</rasd:SinglePciQxl>
    <Type>video</Type>
    <Device>qxl</Device>
    <rasd:Address>{slot=0x02, bus=0x00, domain=0x0000, type=pci, function=0x0}</rasd:Address>
    <BootOrder>0</BootOrder>
    <IsPlugged>true</IsPlugged>
    <IsReadOnly>true</IsReadOnly>
    <Alias>video0</Alias>
    <SpecParams>
        <vram>32768</vram>
        <heads>1</heads>
    </SpecParams>
</Item>

<Item>
    <rasd:Caption>CDROM</rasd:Caption>
    <rasd:InstanceId>7ce1bd14-d98a-43ba-beee-520bdf9c698</rasd:InstanceId>
    <rasd:ResourceType>15</rasd:ResourceType>
    <Type>disk</Type>
    <Device>cdrom</Device>
    <rasd:Address>{bus=1, controller=0, type=drive, target=0, unit=0}</rasd:Address>
    <BootOrder>0</BootOrder>
    <IsPlugged>true</IsPlugged>
    <IsReadOnly>true</IsReadOnly>
    <Alias>ide0-1-0</Alias>
</Item>

<Item>
    <rasd:ResourceType>0</rasd:ResourceType>
    <rasd:InstanceId>8758c42f-7523-461b-82bb-41d91e46fd36</rasd:InstanceId>
    <Type>controller</Type>
    <Device>usb</Device>
    <rasd:Address>{slot=0x01, bus=0x00, domain=0x0000, type=pci, function=0x2}</rasd:Address>
    <BootOrder>0</BootOrder>
    <IsPlugged>true</IsPlugged>
    <IsReadOnly>false</IsReadOnly>
    <Alias>usb0</Alias>
</Item>

<Item>
    <rasd:ResourceType>0</rasd:ResourceType>
    <rasd:InstanceId>58f1a596-553e-4e95-9331-64b5d8cebe2e</rasd:InstanceId>
    <Type>controller</Type>
    <Device>ide</Device>
    <rasd:Address>{slot=0x01, bus=0x00, domain=0x0000, type=pci, function=0x1}</rasd:Address>
    <BootOrder>0</BootOrder>
    <IsPlugged>true</IsPlugged>
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```xml
<Item>
  <rasd:ResourceType>0</rasd:ResourceType>
  <rasd:InstanceId>2f4f8aa5-25eb-4a31-b841-50dc48fce4a7</rasd:InstanceId>
  <Type>channel</Type>
  <Device>unix</Device>
  <rasd:Address>{bus=0, controller=0, type=virtio-serial, port=1}
</rasd:Address>
  <BootOrder>0</BootOrder>
  <IsPlugged>true</IsPlugged>
  <IsReadOnly>false</IsReadOnly>
  <Alias>channel0</Alias>
</Item>

<Item>
  <rasd:ResourceType>0</rasd:ResourceType>
  <rasd:InstanceId>edaac3ed-2ab6-48b1-ae77-cc98f8b45bd8</rasd:InstanceId>
  <Type>channel</Type>
  <Device>unix</Device>
  <rasd:Address>{bus=0, controller=0, type=virtio-serial, port=2}
</rasd:Address>
  <BootOrder>0</BootOrder>
  <IsPlugged>true</IsPlugged>
  <IsReadOnly>false</IsReadOnly>
  <Alias>channel1</Alias>
</Item>

<Item>
  <rasd:ResourceType>0</rasd:ResourceType>
  <rasd:InstanceId>8dfed248-5164-41d3-8b6e-46aef9798d84</rasd:InstanceId>
  <Type>channel</Type>
  <Device>spicevmc</Device>
  <rasd:Address>{bus=0, controller=0, type=virtio-serial, port=3}
</rasd:Address>
  <BootOrder>0</BootOrder>
  <IsPlugged>true</IsPlugged>
  <IsReadOnly>false</IsReadOnly>
  <Alias>channel2</Alias>
</Item>

<Item>
  <rasd:ResourceType>0</rasd:ResourceType>
  <rasd:InstanceId>d184185e-ee19-442a-88f5-6a48f14164e1</rasd:InstanceId>
  <Type>controller</Type>
  <Device>virtio-scsi</Device>
  <rasd:Address>{slot=0x04, bus=0x00, domain=0x0000, type=pci, function=0x00}</rasd:Address>
  <BootOrder>0</BootOrder>
  <IsPlugged>true</IsPlugged>
  <IsReadOnly>false</IsReadOnly>
  <Alias>scsi0</Alias>
</Item>

<Item>
```
You can create a snapshot of a virtual machine that is running (a live snapshot) or shut down by using the **POST** method:

**Example 15.41. Creating a Virtual Machine Snapshot**

```xml
POST /api/vms/00000000-0000-0000-0000-000000000000/snapshots/ HTTP/1.1
Accept: application/xml
Content-type: application/xml

<n snapshot>
  <description>Snapshot description</description>
</n>
```

**IMPORTANT**

Before taking a live snapshot of a virtual machine that uses OpenStack Volume (Cinder) disks, you must freeze and thaw the guest filesystem manually. See Section 15.7.14, “Freeze Virtual Machine Filesystems Action” and Section 15.7.15, “Thaw Virtual Machine Filesystems Action” for more information.
You can restore a virtual machine snapshot using the `rel="restore"` action link in the snapshot representation:

**Example 15.42. Restoring a Virtual Machine Snapshot**

```
POST /api/vms/00000000-0000-0000-0000-000000000000/snapshots/00000000-0000-0000-0000-000000000000/restore HTTP/1.1
Accept: application/xml
Content-type: application/xml

<action/>
```

### 15.6.5.2. Clone a Virtual Machine from a Snapshot

API provides a function to create virtual machines from a snapshot of a previous machine. API users create a new virtual machine while retaining the original virtual machine with all snapshots intact.

Creation of a virtual machines from a snapshot requires an additional `snapshots` element to a standard representation of a virtual machine, which a user sends in a `POST` request to the `vms` collection.

The `snapshots` element contains a `snapshot id=` element to define the specific snapshot to use as a basis for the virtual machine.

**Example 15.43. Clone Virtual Machine from Snapshot**

```
POST /api/vms HTTP/1.1
Accept: application/xml
Content-type: application/xml

<vm>
  ...
  <snapshots>
    <snapshot id="3f68ee63-0016-4f8c-9b8a-11d9f28f7c9e"/>
  </snapshots>
  ...
</vm>
```

### 15.6.6. Statistics Sub-Collection

Each virtual machine resource exposes a `statistics` sub-collection for virtual machine-specific statistics. Each `statistic` contains the following elements:

**Table 15.11. Elements for virtual machine statistics**

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>string</td>
<td>The unique identifier for the statistic entry.</td>
</tr>
<tr>
<td>description</td>
<td>string</td>
<td>A plain text description of the statistic.</td>
</tr>
</tbody>
</table>
The following table lists the statistic types for virtual machines.

**Table 15.12. Virtual machine statistic types**

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>memory.installed</td>
<td>Total memory in bytes allocated for the virtual machine's use.</td>
</tr>
<tr>
<td>memory.used</td>
<td>Current memory in bytes used by the virtual machine.</td>
</tr>
<tr>
<td>cpu.current.guest</td>
<td>Percentage of CPU used by the guest.</td>
</tr>
<tr>
<td>cpu.current.hypervisor</td>
<td>Percentage of CPU overhead on the hypervisor.</td>
</tr>
<tr>
<td>cpu.current.total</td>
<td>Total percentage of the current CPU in use.</td>
</tr>
</tbody>
</table>

**Example 15.44. An XML representation of a virtual machine's statistics sub-collection**

```xml
<statistics>
  <statistic id="ef802239-b74a-329f-9955-be8fea6b50a4" href="/api/vms/cdc0b102-fbfe-444a-b9cb-57d2af94f401/statistics/ef802239-b74a-329f-9955-be8fea6b50a4">
    <name>memory.installed</name>
    <description>Total memory configured</description>
    <unit>BYTES</unit>
    <type>GUAGE</type>
    <values type="DECIMAL">
      <value><datum>1073741824</datum></value>
    </values>
    <vm id="cdc0b102-fbfe-444a-b9cb-57d2af94f401"/>
  </statistic>
</statistics>
```
NOTE

A virtual machine's statistics sub-collection is read-only.

15.6.7. Displaying Virtual Machine Session Information

Submit a GET request for a virtual machine and use the session sub-collection to view the session information for the user that initiated the SPICE console session and the user logged in to the virtual machine.

The session information of a virtual machine is listed as a sub-collection:

Example 15.45. Displaying the session information of a virtual machine

GET /api/roles/a1a701f1-aa06-4f02-af17-158be31489b3/sessions HTTP/1.1
Accept: application/xml
HTTP/1.1 200 OK
Content-Type: application/xml

<sessions>
  <session id="37a6259c-c0c1-dae2-99a7-866489dff0bd"
    href="/api/vms/a1a701f1-aa06-4f02-af17-158be31489b3/sessions/37a6259c-c0c1-dae2-99a7-866489dff0bd"/>
  <vm href="/api/vms/a1a701f1-aa06-4f02-af17-158be31489b3"
    id="a1a701f1-aa06-4f02-af17-158be31489b3"/>
  <ip address="192.0.2.0"/>
  <user href="/api/users/fdfc627c-d875-11e0-90f0-83df133b58cc"
    id="fdfc627c-d875-11e0-90f0-83df133b58cc"/>
    <domain href="/api/domains/696e7465-726e-616c-696e-7465726e616c"
      id="696e7465-726e-616c-696e-7465726e616c"/>
      <name>internal</name>
    </domain>
  </user>
  <console_user>true</console_user>
</session>

<session id="37a6259c-c0c1-dae2-99a7-866489dff0bd"
    href="/api/vms/a1a701f1-aa06-4f02-af17-158be31489b3/sessions/37a6259c-c0c1-dae2-99a7-866489dff0bd"/>
  <vm href="/api/vms/a1a701f1-aa06-4f02-af17-158be31489b3"
    id="a1a701f1-aa06-4f02-af17-158be31489b3"/>
  <user>
    <user_name>root</user_name>
  </user>
</session>
</sessions>
15.7. ACTIONS

15.7.1. Start Virtual Machine Action

The start action launches a stopped, shutdown, or suspended virtual machine.

Example 15.46. Action to start a virtual machine

```
POST /api/vms/5114bb3e-a4e6-44b2-b783-b3eea7d84720/start HTTP/1.1
Accept: application/xml
Content-type: application/xml

<action/>
```

The start action allows a **vm** element to be provided as a parameter. If a **vm** element is provided, the virtual machine uses the values from the provided element and overrides system settings at start time. Using the start action with the **vm** element in REST API is equivalent to using the **Run Once** window in the Administration or User Portal. These settings persist until a user stops the virtual machine. Examples of these elements include **os**, **domain**, **placement_policy**, **cdroms**, **stateless** and **display type**.

Example 15.47. Action to start a virtual machine with overridden parameters

```
POST /api/vms/5114bb3e-a4e6-44b2-b783-b3eea7d84720/start HTTP/1.1
Accept: application/xml
Content-type: application/xml

<action>
  <pause>true</pause>
  <vm>
    <stateless>true</stateless>
    <display>
      <type>spice</type>
    </display>
    <os>
      <boot dev="cdrom"/>
    </os>
    <cdroms>
      <cdrom>
        <file id="windows-xp.iso"/>
      </cdrom>
      <cdrom>
        <file id="virtio-win_x86.vfd"/>
      </cdrom>
    </cdroms>
    <floppies>
      <floppy>
        <file id="virtio-win_x86.vfd"/>
      </floppy>
    </floppies>
    <domain>
      <name>domain.example.com</name>
      <user>
        <user_name>domain_user</user_name>
        <password>domain_password</password>
      </user>
    </domain>
  </vm>
</action>
```
NOTE

- The domain element is used for Windows systems only for overriding parameters on boot with the start action. The domain element determines the domain that the Windows virtual machine joins. If the domain does not exist in the domains collection, this element requires additional user authentication details, including a user_name and password. If the domain exists in the domains collection, the action requires no additional user authentication details.

- The CD image and floppy disk file must be available in the ISO domain already. If not, use the ISO uploader tool to upload the files. See The ISO Uploader Tool for more information.

15.7.2. Start Virtual Machine with Cloud-Init Action

Cloud-Init is a tool for automating the initial setup of virtual machines. You can use the tool to configure the host name, network interfaces, the DNS service, authorized keys, and set user names and passwords. You can also use the custom_script tag to specify a custom script to run on the virtual machine when it boots.

NOTE

The cloud-init element can only be used to start virtual machines with the cloud-init package installed. When the cloud-init element is used, any element within the initialization element but outside the cloud-init element will be ignored.

Example 15.48. Action to start a virtual machine using Cloud-Init

This example shows you how to start a virtual machine using the Cloud-Init tool to set the host name, change the root password, set a static IP for the eth0 interface, configure DNS, and add an SSH key for the root user.

POST /api/vms/5114bb3e-a4e6-44b2-b783-b3eea7d84720/start HTTP/1.1
Accept: application/xml
Content-type: application/xml

<action>
  <vm>
    <initialization>
      <cloud_init>
        <host>
          <address>MyHost.MyDomain.com</address>
        </host>
        <users>
          <user>
15.7.3. Stop Virtual Machine Action

The stop action forces a virtual machine to power-off.

Example 15.49. Action to stop a virtual machine

```shell
POST /api/vms/5114bb3e-a4e6-44b2-b783-b3ee7d84720/stop HTTP/1.1
Accept: application/xml
Content-type: application/xml

<action/>
```
15.7.4. Shutdown Virtual Machine Action

The shutdown action sends a shutdown request to a virtual machine.

Example 15.50. Action to send a shutdown request to a virtual machine

```
POST /api/vms/5114bb3e-a4e6-44b2-b783-b3eea7d84720/shutdown HTTP/1.1
Accept: application/xml
Content-type: application/xml

<action/>
```

15.7.5. Suspend Virtual Machine Action

The suspend action saves the virtual machine state to disk and stops it. Start a suspended virtual machine and restore the virtual machine state with the start action.

Example 15.51. Action to save virtual machine state and suspend the machine

```
POST /api/vms/5114bb3e-a4e6-44b2-b783-b3eea7d84720/suspend HTTP/1.1
Accept: application/xml
Content-type: application/xml

<action/>
```

15.7.6. Reboot Virtual Machine Action

The reboot action sends a reboot request to a virtual machine.

Example 15.52. Action to send a reboot request to a virtual machine

```
POST /api/vms/5114bb3e-a4e6-44b2-b783-b3eea7d84720/reboot HTTP/1.1
Accept: application/xml
Content-type: application/xml

<action/>
```

15.7.7. Enable user logon to access a virtual machine from an external console

The logon action enables users to access a virtual machine from consoles outside of the Red Hat Enterprise Virtualization environment.

This action requires the rhevm-guest-agent-gdm-plugin and the rhevm-guest-agent-pam-module packages to be installed and the **ovirt-guest-agent** service to be running on the virtual machine.
Users require the appropriate user permissions for the virtual machine in order to access the virtual machine from an external console.

**Example 15.53. Logging onto a virtual machine**

```plaintext
POST /api/vms/5114bb3e-a4e6-44b2-b783-b3eea7d84720/logon HTTP/1.1
Content-Type: application/json
Content-Length: 2
{}
```

**15.7.8. Detach Virtual Machine from Pool Action**

The detach action detaches a virtual machine from a pool.

**Example 15.54. Action to detach a virtual machine**

```plaintext
POST /api/vms/5114bb3e-a4e6-44b2-b783-b3eea7d84720/detach HTTP/1.1
Accept: application/xml
Content-type: application/xml

<action/>
```

**15.7.9. Migrate Virtual Machine Action**

The migrate action migrates a virtual machine to another physical host. The destination `host` element is an optional element as Red Hat Enterprise Virtualization Manager automatically selects a default host for migration. If an API user requires a specific `host`, the user can specify the host with either an `id` or `name` parameter.

**Example 15.55. Action to migrate a virtual machine to another host**

```plaintext
POST /api/vms/5114bb3e-a4e6-44b2-b783-b3eea7d84720/migrate HTTP/1.1
Accept: application/xml
Content-type: application/xml

<action>
    <host id="2ab5e1da-b726-4274-bbf7-0a42b16a0fc3"/>
</action>
```

**15.7.10. Cancel Virtual Machine Migration Action**

The cancel migration action stops any migration of a virtual machine to another physical host.

**Example 15.56. Action to cancel migration of a virtual machine to another host**

```plaintext
POST /api/vms/5114bb3e-a4e6-44b2-b783-b3eea7d84720/cancelmigration HTTP/1.1
```
15.7.11. Export Virtual Machine Action

The export action exports a virtual machine to an export storage domain. A destination storage domain must be specified with a storage_domain reference.

The export action reports a failed action if a virtual machine of the same name exists in the destination domain. Set the exclusive parameter to true to change this behavior and overwrite any existing virtual machine.

If snapshots of the virtual machine are not included with the exported virtual machine, set the discard_snapshots parameter to true.

Example 15.57. Action to export a virtual machine to an export storage domain

```xml
POST /api/vms/5114bb3e-a4e6-44b2-b783-b3eea7d84720/export HTTP/1.1
Accept: application/xml
Content-type: application/xml

<action>
  <storage_domain>
    <name>export1</name>
  </storage_domain>
  <exclusive>true</exclusive>
  <discard_snapshots>true</discard_snapshots>
</action>
```

15.7.12. Virtual Machine Ticket Action

The ticket action generates a time-sensitive authentication token for accessing a virtual machine's display. The client-provided action optionally includes a ticket representation containing a value (if the token string needs to take on a particular form) and/or an expiry time in minutes. In any case, the response specifies the actual ticket value and expiry used.

Example 15.58. Action to generate authentication token for a virtual machine

```xml
POST /api/vms/5114bb3e-a4e6-44b2-b783-b3eea7d84720/ticket HTTP/1.1
Accept: application/xml
Content-type: application/xml

<action>
  <ticket>
    <expiry>120</expiry>
  </ticket>
</action>
```

200 OK
15.7.13. Force Remove Virtual Machine Action

An API user forces the removal of a faulty virtual machine with the force action. This action requires a DELETE method. The request body contains an action representation with the force parameter set to true. The request also requires an additional Content-type: application/xml header to process the XML representation in the body.

Example 15.59. Force remove action on a virtual machine

```
DELETE /api/vms/5114bb3e-a4e6-44b2-b783-b3eea7d84720 HTTP/1.1
Accept: application/xml
Content-type: application/xml

?action>
    <force>true</force>
</action>
```

15.7.14. Freeze Virtual Machine Filesystems Action

The freezefilesystems action freezes a virtual machine's filesystems using the QEMU guest agent when taking a live snapshot of a running virtual machine. Normally, this is done automatically by the Manager, but this must be executed manually with the REST API for virtual machines using OpenStack Volume (Cinder) disks.

Freezing the filesystems on the guest operating system ensures a consistent snapshot. Once the snapshot is finished, the guest filesystems must then be thawed. On virtual machines not using an OpenStack Volume disk, the freezing and thawing actions can also be invoked manually using the REST API, which can be useful in the case of a failure during the snapshot process.

Example 15.60. Action to freeze a virtual machine's filesystems

```
POST /api/vms/5114bb3e-a4e6-44b2-b783-b3eea7d84720/freezefilesystems HTTP/1.1
```
For more information on snapshots, see Section 15.6.5.1, “Snapshots Sub-Collection” or the Snapshots section in the Red Hat Enterprise Virtualization Virtual Machine Management Guide.

15.7.15. Thaw Virtual Machine Filesystems Action

The **thawfilesystems** action thaws a virtual machine's filesystems using the QEMU guest agent when taking a live snapshot of a running virtual machine. Normally, this is done automatically by the Manager, but this must be executed manually with the REST API for virtual machines using OpenStack Volume (Cinder) disks.

Freezing the filesystems on the guest operating system ensures a consistent snapshot. Once the snapshot is finished, the guest filesystems must then be thawed. On virtual machines not using a OpenStack Volume disk, the freezing and thawing actions can also be invoked manually using the REST API, which can be useful in the case of a failure during the snapshot process. For example, if the virtual machine became unresponsive during thaw, you can execute the thaw operation again manually; otherwise the virtual machine may remain unresponsive.

**Example 15.61. Action to thaw a virtual machine’s filesystems**

```plaintext
POST /api/vms/5114bb3e-a4e6-44b2-b783-b3eea7d84720/thawfilesystems
HTTP/1.1
Accept: application/xml
Content-type: application/xml

<action/>
```

For more information on snapshots, see Section 15.6.5.1, “Snapshots Sub-Collection” or the Snapshots section in the Red Hat Enterprise Virtualization Virtual Machine Management Guide.
CHAPTER 16. FLOATING DISKS

16.1. FLOATING DISK ELEMENTS

The disks collection provides information about all disks in a Red Hat Enterprise Virtualization environment. A user attaches and detaches disks from any virtual machine and floats them between virtual machines. An API user accesses this information through the rel="disks" link obtained from the entry point URI.

The following table shows specific elements contained in a disks resource representation.

Table 16.1. Elements for floating disks

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>link rel=&quot;statistics&quot;</td>
<td>relationship</td>
<td>A link to the statistics sub-collection for a virtual machine's disk statistics.</td>
<td><img src="%D0%B8%D1%81%D0%BA%D0%B0%D1%82%D1%8C" alt="искать" /></td>
</tr>
<tr>
<td>image_id</td>
<td>GUID</td>
<td>A reference to the virtual machine image stored on the defined storage domain.</td>
<td><img src="%D0%B8%D1%81%D0%BA%D0%B0%D1%82%D1%8C" alt="искать" /></td>
</tr>
<tr>
<td>storage_domains</td>
<td>Complex</td>
<td>The storage domains associated with this disk. Each storage_domain element contains an id attribute with the associated storage domain's GUID. Update this element with POST to perform live migration of a disk from one data storage domain to another.</td>
<td><img src="%D0%B8%D1%81%D0%BA%D0%B0%D1%82%D1%8C" alt="искать" /></td>
</tr>
<tr>
<td>size</td>
<td>integer</td>
<td>Size of the disk in bytes.</td>
<td><img src="%D0%B8%D1%81%D0%BA%D0%B0%D1%82%D1%8C" alt="искать" /></td>
</tr>
<tr>
<td>provisioned_size</td>
<td>integer</td>
<td>The provisioned size of the disk in bytes.</td>
<td><img src="%D0%B8%D1%81%D0%BA%D0%B0%D1%82%D1%8C" alt="искать" /></td>
</tr>
<tr>
<td>actual_size</td>
<td>integer</td>
<td>Actual size of the disk in bytes.</td>
<td><img src="%D0%B8%D1%81%D0%BA%D0%B0%D1%82%D1%8C" alt="искать" /></td>
</tr>
<tr>
<td>status</td>
<td>One of illegal, invalid, locked or ok</td>
<td>The status of the disk device. These states are listed in disk_states under capabilities.</td>
<td><img src="%D0%B8%D1%81%D0%BA%D0%B0%D1%82%D1%8C" alt="искать" /></td>
</tr>
<tr>
<td>interface</td>
<td>enumerated</td>
<td>The type of interface driver used to connect to the disk device. A list of enumerated values is available in capabilities.</td>
<td><img src="%D0%B8%D1%81%D0%BA%D0%B0%D1%82%D1%8C" alt="искать" /></td>
</tr>
</tbody>
</table>
The underlying storage format. A list of enumerated values is available in capabilities. Copy On Write (COW) allows snapshots, with a small performance overhead. Raw does not allow snapshots, but offers improved performance.

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>format</td>
<td>enumerated</td>
<td>The underlying storage format. A list of enumerated values is available in capabilities. Copy On Write (COW) allows snapshots, with a small performance overhead. Raw does not allow snapshots, but offers improved performance.</td>
<td></td>
</tr>
<tr>
<td>sparse</td>
<td>Boolean: true or false</td>
<td><strong>true</strong> if the physical storage for the disk should not be preallocated.</td>
<td></td>
</tr>
<tr>
<td>bootable</td>
<td>Boolean: true or false</td>
<td><strong>true</strong> if this disk is to be marked as bootable.</td>
<td></td>
</tr>
<tr>
<td>shareable</td>
<td>Boolean: true or false</td>
<td><strong>true</strong> to share the disk with multiple virtual machines.</td>
<td></td>
</tr>
<tr>
<td>wipe_after_delete</td>
<td>Boolean: true or false</td>
<td><strong>true</strong> if the underlying physical storage for the disk should be zeroed when the disk is deleted. This increases security but is a more intensive operation and may prolong delete times.</td>
<td></td>
</tr>
<tr>
<td>propagate_errors</td>
<td>Boolean: true or false</td>
<td><strong>true</strong> if disk errors should not cause virtual machine to be paused and, instead, disk errors should be propagated to the guest OS.</td>
<td></td>
</tr>
<tr>
<td>quota_id=</td>
<td>GUID</td>
<td>Sets a quota for the disk.</td>
<td></td>
</tr>
<tr>
<td>lunStorage</td>
<td>complex</td>
<td>A reference to a direct LUN mapping for storage usage. Requires a storage element that contains iSCSI or FCP device details.</td>
<td></td>
</tr>
<tr>
<td>active</td>
<td>Boolean</td>
<td>Defines if the disk is connected to the virtual machine.</td>
<td></td>
</tr>
</tbody>
</table>

**IMPORTANT**

Search queries for disks based upon name require the alias search parameter instead of name.

### 16.2. XML REPRESENTATION OF A FLOATING DISK

**Example 16.1. An XML representation of a disk device**
16.3. METHODS

16.3.1. Creating a Floating Disk

When creating a new floating disk, the API requires the size and storage_domains elements.

Example 16.2. Creating a new a floating disk device

POST /api/disks HTTP/1.1
Accept: application/xml
Content-type: application/xml

disk
  <storage_domains>
    <storage_domain id="fabe0451-701f-4235-8f7e-e20e458819ed"/>
  </storage_domains>
  <size>8589934592</size>
  <type>system</type>
  <interface>virtio</interface>
  <format>cow</format>
</disk>
16.4.1. Statistics Sub-Collection

Each floating disk exposes a statistics sub-collection for disk-specific statistics. Each statistic contains the following elements:

Table 16.2. Elements for virtual machine disk statistics

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>string</td>
<td>The unique identifier for the statistic entry.</td>
</tr>
<tr>
<td>description</td>
<td>string</td>
<td>A plain text description of the statistic.</td>
</tr>
<tr>
<td>unit</td>
<td>string</td>
<td>The unit or rate to measure the statistical values.</td>
</tr>
<tr>
<td>type</td>
<td>One of GAUGE or COUNTER</td>
<td>The type of statistic measures.</td>
</tr>
<tr>
<td>values type=</td>
<td>One of INTEGER or DECIMAL</td>
<td>The data type for the statistical values that follow.</td>
</tr>
<tr>
<td>value</td>
<td>complex</td>
<td>A data set that contains datum.</td>
</tr>
<tr>
<td>datum</td>
<td>see values type</td>
<td>An individual piece of data from a value.</td>
</tr>
<tr>
<td>disk id=</td>
<td>relationship</td>
<td>A relationship to the containing disk resource.</td>
</tr>
</tbody>
</table>

The following table lists the statistic types for floating disks.

Table 16.3. Disk statistic types

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>data.current.read</td>
<td>The data transfer rate in bytes per second when reading from the disk.</td>
</tr>
<tr>
<td>data.current.write</td>
<td>The data transfer rate in bytes per second when writing to the disk.</td>
</tr>
</tbody>
</table>

Example 16.3. An XML representation of a virtual machine's statistics sub-collection

```xml
<statistics>
  <statistic id="33b9212b-f9cb-3fd0-b364-248fb61e1272"
    href="/api/disks/f28ec14c-fc85-43e1-818d-96b49d50e27b/statistics/33b9212b-f9cb-3fd0-b364-248fb61e1272">
    <name>data.current.read</name>
    <description>Read data rate</description>
    <values type="DECIMAL">
      <value>
        <datum>0</datum>
      </value>
    </values>
  </statistic>
</statistics>
```
16.5. ACTIONS

16.5.1. Copying a Floating Disk

When copying a floating disk, the API requires the `storage_domain` element. The optional `name` element specifies an alias for the disk.

Example 16.4. Copying a Floating Disk

```
POST /api/disks/54a81464-b758-495a-824b-1e7937116ae5/copy HTTP/1.1
Accept: application/xml
Content-type: application/xml

?action>
   <storage_domain id="c8e108f7-c049-40d2-ad3d-620e4638828e"/>
   <disk>
      <name>rhel_disk2</name>
   </disk>
</action>
```
CHAPTER 17. TEMPLATES

17.1. VIRTUAL MACHINE TEMPLATE ELEMENTS

The templates collection provides information about the virtual machine templates in a Red Hat Enterprise Virtualization environment. An API user accesses this information through the rel="templates" link obtained from the entry point URI.

Additional information can be retrieved for GET requests using the All-Content: true header.

The following table shows specific elements contained in a virtual machine template resource representation.

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>link rel=&quot;disks&quot;</td>
<td>relationship</td>
<td>A link to the disks sub-collection for virtual machine template resources.</td>
<td></td>
</tr>
<tr>
<td>link rel=&quot;nics&quot;</td>
<td>relationship</td>
<td>A link to the nics sub-collection for virtual machine template resources.</td>
<td></td>
</tr>
<tr>
<td>link rel=&quot;cdroms&quot;</td>
<td>relationship</td>
<td>A link to the cdroms sub-collection for virtual machine template resources.</td>
<td></td>
</tr>
<tr>
<td>link rel=&quot;permissions&quot;</td>
<td>relationship</td>
<td>A link to the permissions sub-collection for virtual machine template permissions.</td>
<td></td>
</tr>
<tr>
<td>type</td>
<td>enumerated</td>
<td>The type of virtual machine the template provides. A list of enumerated values are available in capabilities.</td>
<td></td>
</tr>
<tr>
<td>status</td>
<td>One of illegal, locked or ok</td>
<td>The template status. These states are listed in template_states under capabilities.</td>
<td></td>
</tr>
<tr>
<td>memory</td>
<td>integer</td>
<td>The amount of memory allocated to the guest, in bytes.</td>
<td></td>
</tr>
<tr>
<td>cpu</td>
<td>complex</td>
<td>The CPU topology (i.e. number of sockets and cores) available to the guest.</td>
<td></td>
</tr>
<tr>
<td>os type=</td>
<td>string, e.g. RHEL5 or WindowsXP</td>
<td>The guest operating system type.</td>
<td></td>
</tr>
<tr>
<td>Element</td>
<td>Type</td>
<td>Description</td>
<td>Properties</td>
</tr>
<tr>
<td>-----------------</td>
<td>------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>os boot dev=</td>
<td>enumerated</td>
<td>A list of boot devices, described by a dev attribute on a boot element. A list of enumerated values are available in capabilities.</td>
<td></td>
</tr>
<tr>
<td>os kernel</td>
<td>string</td>
<td>A path to a kernel image which the template is configured to boot from.</td>
<td></td>
</tr>
<tr>
<td>os initrd</td>
<td>string</td>
<td>A path to an initrd image to be used with the kernel above.</td>
<td></td>
</tr>
<tr>
<td>os cmdline</td>
<td>string</td>
<td>A kernel command line parameter string to be used with the kernel above.</td>
<td></td>
</tr>
<tr>
<td>cluster id=</td>
<td>GUID</td>
<td>A reference to the template's host cluster.</td>
<td></td>
</tr>
<tr>
<td>vm id=</td>
<td>GUID</td>
<td>A reference to the VM on which this template is based.</td>
<td></td>
</tr>
<tr>
<td>domain id=</td>
<td>GUID</td>
<td>A reference to the template's domain.</td>
<td></td>
</tr>
<tr>
<td>creation time</td>
<td>xsd:dateTime</td>
<td>The date and time at which this template was created.</td>
<td></td>
</tr>
<tr>
<td>origin</td>
<td></td>
<td>One of rhev, ovirt, vmware or xen</td>
<td></td>
</tr>
<tr>
<td>high_availability</td>
<td>complex</td>
<td>Set enabled to true if the VM should be automatically restarted if the host crashes. A priority element controls the order in which VMs are restarted.</td>
<td></td>
</tr>
<tr>
<td>display</td>
<td>complex</td>
<td>The display type (either vnc or spice), port, and the number of monitors. The allow_reconnect Boolean value specifies if a client can reconnect to the machine via display.</td>
<td></td>
</tr>
</tbody>
</table>
A stateless template contains a snapshot of its disk image taken at boot and deleted at shutdown. This means state changes do not persist after a reboot.

Defines the USB policy for a virtual machine template. Requires an enabled element set to a Boolean value and a type element set to either native or legacy.

Sets the placement policy for virtual machine migration. Requires a default host= and an affinity (one of migratable, user_migratable or pinned). Leave the host element empty to set no preferred host.

A set of user-defined environment variable passed as parameters to custom scripts. Each custom_property contains name and value attributes. A list of enumerated values are available in capabilities.

The the Sysprep timezone setting for a Windows virtual machine template.

The the Sysprep domain setting for a Windows virtual machine template. Requires a name from the domains collection.

### 17.2. XML REPRESENTATION OF A VIRTUAL MACHINE TEMPLATE

**Example 17.1. An XML representation of a virtual machine template**

```xml
<template href="/api/templates/00000000-0000-0000-0000-000000000000" id="00000000-0000-0000-0000-000000000000">
  <actions>
    <link href="/api/templates/00000000-0000-0000-0000-000000000000/export" rel="export"/>
  </actions>
  <name>Blank</name>
  <description>Blank template</description>
</template>
```
<comment>Blank template</comment>
<link href="/api/templates/00000000-0000-0000-0000-000000000000/disks"
rel="disks"/>
<link href="/api/templates/00000000-0000-0000-0000-000000000000/nics"
rel="nics"/>
<link href="/api/templates/00000000-0000-0000-0000-000000000000/cdroms"
rel="cdroms"/>
<link href="/api/templates/00000000-0000-0000-0000-000000000000/permissions"
rel="permissions"/>
<link href="/api/templates/00000000-0000-0000-0000-000000000000/watchdogs"
rel="watchdogs"/>
<type>server</type>
=status>
  <state>ok</state>
</status>
<memory>536870912</memory>
<cpu>
  <topology sockets="1" cores="1"/>
  <architecture>X86_64</architecture>
</cpu>
<cpu_shares>0</cpu_shares>
<os type="rhel_6x64">
  <boot dev="hd"/>
  <boot dev="cdrom"/>
</os>
<cluster id="00000000-0000-0000-0000-000000000000"
href="/api/clusters/00000000-0000-0000-0000-000000000000"/>
<creation_time>2010-08-16T14:24:29</creation_time>
<origin>ovirt</origin>
<high_availability>
  <enabled>true</enabled>
  <priority>100</priority>
</high_availability>
<display>
  <type>spice</type>
  <monitors>1</monitors>
  <single_qxl_pci>false</single_qxl_pci>
  <allow_override>true</allow_override>
  <smartcard_enabled>true</smartcard_enabled>
</display>
<stateless>false</stateless>
<delete_protected>false</delete_protected>
<sso>
  <methods>
    <method id="GUEST_AGENT">true</method>
  </methods>
</sso>
<usb>
  <enabled>true</enabled>
</usb>
<migration_downtime>-1</migration_downtime>
17.3. METHODS

17.3.1. Creating a New Template

Creation of a new template requires the name and vm elements. Identify the vm with the id attribute or name element.

Example 17.2. Creating a template from a virtual machine

```
POST /api/templates HTTP/1.1
Accept: application/xml
Content-type: application/xml

<template>
  <name>template1</name>
  <vm id="00000000-0000-0000-0000-000000000000"/>
</template>
```

17.3.2. Creating a New Template Sub Version

Creation of a new template sub version requires the name and vm elements for the new template, and the base_template and version_name elements for the new template version. The base_template and version_name elements must be specified within a version section enclosed in the template section. Identify the vm with the id attribute or name element.

Example 17.3. Creating a template sub version from a virtual machine

```
POST /api/templates HTTP/1.1
Accept: application/xml
Content-type: application/xml

<template>
  <name>template1_001</name>
  <vm id="00000000-0000-0000-0000-000000000000"/>
  <version>
    <base_template id="00000000-0000-0000-0000-000000000000"/>
    <version_name>"template1_001"</version_name>
  </version>
</template>
```
17.3.3. Updating a Template

The name, description, type, memory, cpu topology, os, high_availability, display, stateless, usb and timezone elements can be updated after a template has been created.

Example 17.4. Updating a virtual machine template to contain 1 GB of memory

```
PUT /api/templates/00000000-0000-0000-0000-000000000000 HTTP/1.1
Accept: application/xml
Content-type: application/xml
<template>
  <memory>1073741824</memory>
</template>
```

17.3.4. Updating a Template Sub Version

Only the version_name element can be updated after a template sub version has been created.

Example 17.5. Updating a virtual machine template sub version name

```
PUT /api/templates/00000000-0000-0000-0000-000000000000 HTTP/1.1
Accept: application/xml
Content-type: application/xml

<template>
  <version>
    <version_name>template1_002</version_name>
  </version>
</template>
```

17.3.5. Removing a Template

Removal of a virtual machine template requires a DELETE request.

Example 17.6. Removing a virtual machine template

```
DELETE /api/templates/00000000-0000-0000-0000-000000000000 HTTP/1.1
HTTP/1.1 204 No Content
```

17.4. ACTIONS

17.4.1. Export Template Action

The templates collection contains an export action.
The export action exports a template to an **Export** storage domain. A destination storage domain is specified with a **storage_domain** reference.

The export action reports a failed action if a virtual machine template of the same name exists in the destination domain. Set the **exclusive** parameter to **true** to change this behavior and overwrite any existing virtual machine template.

**Example 17.7. Action to export a template to an export storage domain**

```
POST /api/templates/00000000-0000-0000-0000-000000000000/export HTTP/1.1
Accept: application/xml
Content-type: application/xml

?action<storage_domain id="00000000-0000-0000-0000-000000000000"/>
<exclusive>true<exclusive/>
</action>
```
CHAPTER 18. VIRTUAL MACHINE POOLS

18.1. VIRTUAL MACHINE POOL ELEMENTS

The vmpools collection provides information about the virtual machine pools in a Red Hat Enterprise Virtualization environment. An API user accesses this information through the rel="vmpools" link obtained from the entry point URI.

The following table shows specific elements contained in a virtual machine pool resource representation.

Table 18.1. Virtual machine pool elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>string</td>
<td>A user-supplied, human readable name for the pool. The name is unique across all pool resources.</td>
<td>![warning]</td>
</tr>
<tr>
<td>description</td>
<td>string</td>
<td>A user-supplied, human readable description of the virtual machine pool.</td>
<td>![notice]</td>
</tr>
<tr>
<td>link rel=&quot;permissions&quot;</td>
<td>relationship</td>
<td>A link to the permissions sub-collection for virtual machine pool permissions.</td>
<td>![link]</td>
</tr>
<tr>
<td>size</td>
<td>integer</td>
<td>The number of virtual machines in the pool.</td>
<td>![number]</td>
</tr>
<tr>
<td>cluster id=</td>
<td>GUID</td>
<td>A reference to the cluster resource in which virtual machines in this pool run.</td>
<td>![cluster]</td>
</tr>
<tr>
<td>template id=</td>
<td>GUID</td>
<td>A reference to the template resource on which virtual machines in this pool are based.</td>
<td>![template]</td>
</tr>
<tr>
<td>prestarted_vms</td>
<td>integer</td>
<td>The number of prestarted virtual machines in the virtual machine pool.</td>
<td>![prestarted]</td>
</tr>
<tr>
<td>max_user_vms</td>
<td>integer</td>
<td>The maximum number of virtual machines any one user can take from the virtual machine pool.</td>
<td>![max_user]</td>
</tr>
</tbody>
</table>

IMPORTANT

The API as documented in this chapter is experimental and subject to change. It is not covered by the backwards compatibility statement.

18.2. XML REPRESENTATION OF A VIRTUAL MACHINE POOL
Example 18.1. An XML representation of a virtual machine pool

```xml
<vmpool href="/api/vmpools/2d2d5e26-1b6e-11e1-8cda-001320f76e8e">
  id="2d2d5e26-1b6e-11e1-8cda-001320f76e8e"
  <actions>
    <link href="/api/vmpools/2d2d5e26-1b6e-11e1-8cda-001320f76e8e/allocatevm"
      rel="allocatevm"/>
  </actions>
  <name>VMPool1</name>
  <description>Virtual Machine Pool 1</description>
  <size>2</size>
  <cluster href="/api/clusters/99408929-82cf-4dc7-a532-9d998063fa95"/> id="99408929-82cf-4dc7-a532-9d998063fa95"
  <template href="/api/templates/00000000-0000-0000-0000-000000000000" id="00000000-0000-0000-0000-000000000000"/>
  <prestarted_vms>0</prestarted_vms>
  <max_user_vms>1</max_user_vms>
</vmpool>
```

18.3. METHODS

18.3.1. Creating a New Virtual Machine Pool

A new pool requires the **name**, **cluster** and **template** elements. Identify the **cluster** and **template** with the **id** attribute or **name** element.

Example 18.2. Creating a virtual machine pool

```
POST /api/vmpools HTTP/1.1
Accept: application/xml
Content-type: application/xml

<vmpool>
  <name>VM_Pool_A</name>
  <cluster href="/api/clusters/99408929-82cf-4dc7-a532-9d998063fa95"/>
  id="99408929-82cf-4dc7-a532-9d998063fa95"
  <template href="/api/templates/00000000-0000-0000-0000-000000000000" id="00000000-0000-0000-0000-000000000000"/>
  <prestarted_vms>0</prestarted_vms>
  <max_user_vms>1</max_user_vms>
</vmpool>
```

18.3.2. Updating a Virtual Machine Pool

The **name**, **description**, **size**, **prestarted_vms** and **max_user_vms** can be updated after the virtual machine has been created.

Example 18.3. Updating a virtual machine pool
### 18.3.3. Removing a Virtual Machine Pool

Removal of a virtual machine pool requires a DELETE request.

#### Example 18.4. Removing a virtual machine

```plaintext
DELETE /api/vmpools/2d2d5e26-1b6e-11e1-8cda-001320f76e8e HTTP/1.1
HTTP/1.1 204 No Content
```

### 18.4. ACTIONS

#### 18.4.1. Allocate Virtual Machine Action

The allocate virtual machine action allocates a virtual machine in the virtual machine pool.

#### Example 18.5. Action to allocate a virtual machine from a virtual machine pool

```plaintext
POST /api/vmpools/2d2d5e26-1b6e-11e1-8cda-001320f76e8e/allocatevm HTTP/1.1
Accept: application/xml
Content-type: application/xml

?action/>
```
CHAPTER 19. DOMAINS

19.1. DOMAIN ELEMENTS

The API provides the ability to access user and group information from the organization's directory service using the domains collection. Domain information is referenced with the rel="domains" link.

Table 19.1. Domain elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>string</td>
<td>The domain name.</td>
</tr>
<tr>
<td>link rel=&quot;users&quot;</td>
<td>relationship</td>
<td>A link to the sub-collection for users associated with this domain.</td>
</tr>
<tr>
<td>link rel=&quot;groups&quot;</td>
<td>relationship</td>
<td>A link to the sub-collection for groups associated with this domain.</td>
</tr>
</tbody>
</table>

The links to users and groups sub-collections also accept search queries.

NOTE

The domains collection and its sub-collections are read-only.

19.2. XML REPRESENTATION OF A DOMAIN RESOURCE

Example 19.1. An XML representation of a domain resource

```xml
<domain id="77696e32-6b38-7268-6576-2e656e676c61"
  href="/api/domains/77696e32-6b38-7268-6576-2e656e676c61">
  <name>domain.example.com</name>
  <link rel="users"
    href="/api/domains/77696e32-6b38-7268-6576-2e656e676c61/users"/>
  <link rel="groups"
    href="/api/domains/77696e32-6b38-7268-6576-2e656e676c61/groups"/>
  <link rel="users/search"
    href="/api/domains/77696e32-6b38-7268-6576-2e656e676c61/users?search={query}"/>
  <link rel="groups/search"
    href="/api/domains/77696e32-6b38-7268-6576-2e656e676c61/groups?search={query}"/>
</domain>
```

19.3. SUB-COLLECTIONS

19.3.1. Domain Users Sub-Collection
The **users** sub-collection contains all users in the directory service. This information is used to add new users to the Red Hat Enterprise Virtualization environment.

### Table 19.2. Domain user elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>string</td>
<td>The name of the user.</td>
</tr>
<tr>
<td>last_name</td>
<td>string</td>
<td>The surname of the user.</td>
</tr>
<tr>
<td>user_name</td>
<td>string</td>
<td>The user name from directory service.</td>
</tr>
<tr>
<td>domain id</td>
<td>GUID</td>
<td>The containing directory service domain.</td>
</tr>
<tr>
<td>groups</td>
<td>complex</td>
<td>A list of directory service groups for this user.</td>
</tr>
</tbody>
</table>

#### Example 19.2. An XML representation of a user in the users sub-collection

```
<user id="225f15cd-e891-434d-8262-a66808fcb9b1"
  href="/api/domains/77696e32-6b38-7268-6576-2e656e676c61/users/
  d3b4e7be-5f57-4dac-b937-21e1771a501f">
  <name>RHEV-M Admin</name>
  <user_name>rhevmadmin@domain.example.com</user_name>
  <domain id="77696e32-6b38-7268-6576-2e656e676c61"
    href="/api/domains/77696e32-6b38-7268-6576-2e656e676c61"/>
  <groups>
    <group>
      <name>domain.example.com/Users/Enterprise Admins</name>
    </group>
    <group>
      <name>domain.example.com/Users/Domain Admins</name>
    </group>
    ...
  </groups>
</user>
```

### 19.3.2. Domain Groups Sub-Collection

The **groups** sub-collection contains all groups in the directory service. A domain **group** resource contains a set of elements.

#### Table 19.3. Domain group elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>string</td>
<td>The name of the group.</td>
</tr>
<tr>
<td>domain id</td>
<td>GUID</td>
<td>The containing directory service domain.</td>
</tr>
</tbody>
</table>
Example 19.3. An XML representation of a group in the groups sub-collection

```xml
<group id="85bf8d97-273c-4a5c-b801-b17d58330dab"
      href="/api/domains/77696e32-6b38-7268-6576-2e656e676c61/groups/85bf8d97-273c-4a5c-b801-b17d58330dab">
  <name>example.com/Users/Enterprise Admins</name>
  <domain id="77696e32-6b38-7268-6576-2e656e676c61"
         href="/api/domains/77696e32-6b38-7268-6576-2e656e676c61"/>
</group>
```
CHAPTER 20. GROUPS

20.1. IMPORTED GROUP ELEMENTS

The groups collection contains imported groups from directory services. A group resource contains a set of elements.

Table 20.1. Imported group elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>link rel=&quot;tags&quot;</td>
<td>relationship</td>
<td>A link to the tags sub-collection for tags attached to this group.</td>
</tr>
<tr>
<td>link rel=&quot;permissions&quot;</td>
<td>relationship</td>
<td>A link to the permissions sub-collection for permissions attached to this group.</td>
</tr>
<tr>
<td>link rel=&quot;roles&quot;</td>
<td>relationship</td>
<td>A link to the roles sub-collection for roles attached to this group.</td>
</tr>
</tbody>
</table>

20.2. XML REPRESENTATION OF A GROUP RESOURCE

Example 20.1. An XML representation of a group resource

```xml
<group id="85bf8d97-273c-4a5c-b801-b17d58330dab"
      href="/api/groups/85bf8d97-273c-4a5c-b801-b17d58330dab">
  <name>Everyone</name>
  <link rel="tags"
        href="/api/groups/85bf8d97-273c-4a5c-b801-b17d58330dab/tags"/>
  <link rel="permissions"
        href="/api/groups/85bf8d97-273c-4a5c-b801-b17d58330dab/permissions"/>
  <link rel="roles"
        href="/api/groups/85bf8d97-273c-4a5c-b801-b17d58330dab/roles"/>
  <domain_entry_id>6565653030303030-30303030-30303030-30303030</domain_entry_id>
  <namespace>*</namespace>
</group>
```

20.3. ADDING A GROUP FROM A DIRECTORY SERVICE

The API adds existing directory service groups to the Red Hat Enterprise Virtualization Manager database with a POST request to the groups collection.

Example 20.2. Adding a group from a directory service

```bash
POST /api/group HTTP/1.1
Content-Type: application/xml
```
Accept: application/xml

<group>
  <name>www.example.com/accounts/groups/mygroup</name>
  <domain>
    <name>example.com</name>
  </domain>
</group>
CHAPTER 21. ROLES

21.1. ROLE ELEMENTS

The rel="roles" link obtained from the entry point URI provides access to a static set of system roles. Each individual role element contains the following:

Table 21.1. Role elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>link=&quot;permits&quot;</td>
<td>relationship</td>
<td>A link to the permits sub-collection for role permits.</td>
</tr>
<tr>
<td>mutable</td>
<td>Boolean: true or false</td>
<td>Defines the ability to update or delete the role. Roles with mutable set to false are roles built into the Red Hat Enterprise Virtualization environment.</td>
</tr>
<tr>
<td>administrative</td>
<td>Boolean: true or false</td>
<td>Defines the role as administrative-only.</td>
</tr>
</tbody>
</table>

21.2. XML REPRESENTATION OF THE ROLES COLLECTION

Example 21.1. An XML representation of the roles collection

```xml
<roles>
  <role id="00000000-0000-0000-0000-000000000001"
    href="/api/roles/00000000-0000-0000-0000-000000000000-000000000001">
    <name>SuperUser</name>
    <description>Roles management administrator</description>
    <link rel="permits" href="/api/roles/00000000-0000-0000-0000-000000000000-000000000001/permits"/>
    <mutable>false</mutable>
    <administrative>true</administrative>
  </role>
  <role id="00000000-0000-0000-0001-000000000001"
    href="/api/roles/00000000-0000-0000-0001-000000000001">
    <name>RHEVMUser</name>
    <description>RHEVM user</description>
    <link rel="permits" href="/api/roles/00000000-0000-0000-0001-000000000001-000000000001/permits"/>
    <mutable>false</mutable>
    <administrative>false</administrative>
  </role>
  <role id="00000000-0000-0000-0001-000000000002"
    href="/api/roles/00000000-0000-0000-0001-000000000001-000000000002">
    <name>RHEVMPowerUser</name>
    <description>RHEVM power user</description>
    <link rel="permits" href="/api/roles/00000000-0000-0000-0001-000000000001-000000000002/permits"/>
    <mutable>false</mutable>
    <administrative>true</administrative>
  </role>
</roles>
```
21.3. METHODS

21.3.1. Creating a Role

Creation of a role requires values for name, administrative and a list of initial permits.

Example 21.2. Creating a role

```xml
POST /api/roles HTTP/1.1
Accept: application/xml
Content-type: application/xml

<role>
  <name>Finance Role</name>
  <administrative>true</administrative>
  <permits>
    <permit id="1"/>
  </permits>
</role>
```

21.3.2. Updating a Role

The name, description and administrative elements are updatable post-creation.

Example 21.3. Updating a role

```xml
PUT /api/roles/8de42ad7-f307-408b-80e8-9d28b85adfd7 HTTP/1.1
Accept: application/xml
Content-type: application/xml

<role>
  <name>Engineering Role</name>
  <description>Standard users in the Engineering Role</description>
  <administrative>false</administrative>
</role>
```

21.3.3. Removing a Role

Removal of a role requires a DELETE request.

Example 21.4. Removing a role
21.4. ROLES PERMITS SUB-COLLECTION

21.4.1. Roles Permits Sub-Collection

Each role contains a set of allowable actions, or permits, which the API lists in capabilities.

A role’s permits are listed as a sub-collection:

Example 21.5. Listing a role’s permits

GET /api/roles/b67dfbe2-0dbc-41e4-86d3-a2fbe02cfa9/permits HTTP/1.1
Accept: application/xml

HTTP/1.1 200 OK
Content-Type: application/xml

<permits>
  <permit id="1"
    href="/api/roles/b67dfbe2-0dbc-41e4-86d3-a2fbe02cfa9/permits/1">
    <name>create_vm</name>
    <administrative>false</administrative>
    <role id="b67dfbe2-0dbc-41e4-86d3-a2fbe02cfa9"
      href="/api/roles/b67dfbe2-0dbc-41e4-86d3-a2fbe02cfa9"/>
  </permit>
  ...
</permits>

21.4.2. Assign a Permit to a Role

Assign a permit to a role with a POST request to the permits sub-collection. Use either an id attribute or a name element to specify the permit to assign.

Example 21.6. Assign a permit to a role

POST /api/roles/b67dfbe2-0dbc-41e4-86d3-a2fbe02cfa9/permits HTTP/1.1
Accept: application/xml
Content-Type: application/xml

<permit id="1"/>

HTTP/1.1 201 Created
Content-Type: application/xml

<permits>
  <permit id="1"
    href="/api/roles/b67dfbe2-0dbc-41e4-86d3-a2fbe02cfa9/permits/1">

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21.4.3. Remove a Permit from a Role

Remove a permit from a role with a DELETE request to the permit resource.

Example 21.7. Remove a permit from a role

DELETE /api/roles/b67dfbe2-0dbc-41e4-86d3-a2fbef02cfa9/permits/1
HTTP/1.1

HTTP/1.1 204 No Content
CHAPTER 22. USERS

22.1. USER ELEMENTS

Users are exposed in a top-level collection and are referenced with the rel="users" link. Individual user elements contain the following:

Table 22.1. User elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>user_name</td>
<td>string</td>
<td>The user principal name (UPN). The UPN is used as a more convenient identifier when adding a new user.</td>
<td></td>
</tr>
<tr>
<td>link rel=&quot;tags&quot;</td>
<td>relationship</td>
<td>A link to the tags sub-collection for user resources.</td>
<td></td>
</tr>
<tr>
<td>link rel=&quot;roles&quot;</td>
<td>relationship</td>
<td>A link to the roles sub-collection for user resources.</td>
<td></td>
</tr>
<tr>
<td>name</td>
<td>string</td>
<td>A free-text name for the user.</td>
<td></td>
</tr>
<tr>
<td>domain</td>
<td>string</td>
<td>The containing directory service domain.</td>
<td></td>
</tr>
<tr>
<td>groups</td>
<td>complex</td>
<td>A list of directory service groups for this user.</td>
<td></td>
</tr>
</tbody>
</table>

22.2. XML REPRESENTATION OF A USER RESOURCE

Example 22.1. An XML representation of a user resource

GET /api/users HTTP/1.1
Accept: application/xml

```xml
  <user id="225f15cd-e891-434d-8262-a66808fcb9b1"
       href="/api/users/225f15cd-e891-434d-8262-a66808fcb9b1">
    <name>RHEV-M Admin</name>
    <actions/>
    <link rel="roles" href="/api/users/225f15cd-e891-434d-8262-a66808fcb9b1/roles"/>
    <link rel="tags" href="/api/users/225f15cd-e891-434d-8262-a66808fcb9b1/tags"/>
    <domain>domain.example.com</domain>
    <logged_in>false</logged_in>
    <user_name>rhevmadmin@domain.example.com</user_name>
    <groups>
```
22.3. METHODS

22.3.1. Adding a User

The API adds an existing directory service user to the Red Hat Enterprise Virtualization Manager database with a **POST** request to the **users** collection. The client-provided new user representation includes an embedded **roles** list with at least one initial **role** to assign to the user. For example, the following request assigns two initial roles to the user `joe@domain.example.com`:

```
Example 22.2. Adding a user from directory service and assigning two roles

POST /api/users HTTP/1.1
Content-Type: application/xml
Accept: application/xml

<user>
    <user_name>joe@domain.example.com</user_name>
    <roles>
        <role>
            <name>RHEVMPowerUser</name>
        </role>
        <role id="00000000-0000-0000-0001-000000000003"/>
    </roles>
</user>
```

The new user is identified either by Red Hat Enterprise Virtualization Manager user ID or via the directory service user principal name (UPN). The user ID format reported from the directory service domain might be different to the expected Red Hat Enterprise Virtualization Manager format, such as in LDIF [5], the ID has the opposite byte order and is base-64 encoded. Hence it is usually more convenient to refer to the new user by UPN.

**NOTE**

The user exists in the directory service domain before it is added to the Red Hat Enterprise Virtualization Manager database. An API user has the option to query this domain through the **domains** collection prior to creation of the user.

Roles are identified either by name or ID. The example above shows both approaches.

22.3.2. Adding Roles to a User
Further roles are attached or detached with **POST** or **DELETE** requests to the roles sub-collection of an individual user. The example below illustrates how the API adds the **RHEVMVDIUser** role to the role assignments for a particular user.

**NOTE**

The embedded user roles list of the **user** element is only used for the initial creation. All interactions post-creation with the user's role assignments go through the **roles** sub-collection.

**Example 22.3. Adding roles to a user**

```
POST /api/users/225f15cd-e891-434d-8262-a66808fcb9b1/roles HTTP/1.1
Content-Type: application/xml
Accept: application/xml

<role>
  <name>RHEVMVDIUser</name>
</role>
```

CHAPTER 23. MAC ADDRESS POOLS

23.1. MAC ADDRESS POOL ELEMENTS

The macpools collection provides information about the MAC address pools in a Red Hat Enterprise Virtualization environment. An API user accesses this information through the rel="macpools" link obtained from the entry point URI. The following table shows specific elements contained in a MAC address pool resource representation.

Table 23.1. MAC address pool elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>string</td>
<td>A plain text, human-readable name for the MAC address pool.</td>
<td>![Warning]</td>
</tr>
<tr>
<td>description</td>
<td>string</td>
<td>A plain text, human-readable description of the MAC address pool.</td>
<td>![Warning]</td>
</tr>
<tr>
<td>allow_duplicates</td>
<td>Boolean: true or false</td>
<td>Defines whether duplicate MAC addresses are permitted in the pool. If not specified, allow_duplicates defaults to false.</td>
<td>![Notice]</td>
</tr>
<tr>
<td>default_pool</td>
<td>Boolean: true or false</td>
<td>Defines whether this is the default pool. If not specified, default_pool defaults to false.</td>
<td>![Lock]</td>
</tr>
<tr>
<td>ranges</td>
<td>complex</td>
<td>Defines the range of MAC addresses for the pool. Multiple ranges can be defined within the ranges element.</td>
<td>![Warning]</td>
</tr>
</tbody>
</table>

23.2. XML REPRESENTATION OF THE MAC ADDRESS POOLS COLLECTION

Example 23.1. An XML representation of the MAC address pools collection

```xml
<mac_pools>
  <mac_pool href="/api/macpools/00000000-0000-0000-0000-000000000000" id="00000000-0000-0000-0000-000000000000">
    <name>Default</name>
    <description>Default MAC pool</description>
    <allow_duplicates>false</allow_duplicates>
    <default_pool>true</default_pool>
    <ranges>
      <range>
        <from>00:1A:4A:16:01:51</from>
        <to>00:1A:4A:16:01:e6</to>
      </range>
    </ranges>
  </mac_pool>
</mac_pools>
```
23.3. METHODS

23.3.1. Creating a MAC Address Pool

Creation of a MAC address pool requires values for name and ranges.

Example 23.2. Creating a MAC address pool

```
POST /api/macpools HTTP/1.1
Accept: application/xml
Content-type: application/xml

<mac_pool>
  <name>MACPool</name>
  <description>A MAC address pool</description>
  <allow_duplicates>true</allow_duplicates>
  <default_pool>false</default_pool>
  <ranges>
    <range>
      <from>00:1A:4A:16:01:51</from>
      <to>00:1A:4A:16:01:e6</to>
    </range>
  </ranges>
</mac_pool>
```

23.3.2. Updating a MAC Address Pool

The name, description, allow_duplicates, and ranges elements are updatable post-creation.

Example 23.3. Updating a MAC address pool

```
PUT /api/macpools/ab39bbc1-1d64-4737-9b20-ce081f99b0e1 HTTP/1.1
Accept: application/xml
Content-type: application/xml

<mac_pool>
  <name>UpdatedMACPool</name>
  <description>An updated MAC address pool</description>
  <allow_duplicates>false</allow_duplicates>
  <ranges>
    <range>
      <from>00:1A:4A:16:01:51</from>
      <to>00:1A:4A:16:01:e6</to>
    </range>
    <range>
      <from>02:1A:4A:01:00:00</from>
      <to>02:1A:4A:FF:FF:FF</to>
    </range>
  </ranges>
</mac_pool>
```
23.3.3. Removing a MAC Address Pool

Removal of a MAC address pool requires a **DELETE** request.

**Example 23.4. Removing a MAC address pool**

```bash
DELETE /api/macpools/ab39bbc1-1d64-4737-9b20-ce081f99b0e1 HTTP/1.1
HTTP/1.1 204 No Content
```
CHAPTER 24. TAGS

24.1. TAG ELEMENTS

The **tags** collection provides information about tags in a Red Hat Enterprise Virtualization environment. An API user accesses this information through the `rel="tags"` link obtained from the entry point URI.

The following table shows specific elements contained in a tag resource representation.

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>host</td>
<td>GUID</td>
<td>A reference to the host which the tag is attached.</td>
<td></td>
</tr>
<tr>
<td>user</td>
<td>GUID</td>
<td>A reference to the user which the tag is attached.</td>
<td></td>
</tr>
<tr>
<td>vm</td>
<td>GUID</td>
<td>A reference to the VM which the tag is attached.</td>
<td></td>
</tr>
<tr>
<td>parent</td>
<td>complex</td>
<td>A reference to the VM which the tag is attached.</td>
<td></td>
</tr>
</tbody>
</table>

24.2. XML REPRESENTATION OF A TAG RESOURCE

**Example 24.1. An XML representation of a tag resource**

```xml
<tag id="f436ebfc-67f2-41bd-8ec6-902b6f7dcb5e" href="/api/tags/f436ebfc-67f2-41bd-8ec6-902b6f7dcb5e">
  <name>Finance</name>
  <description>Resources for the Finance department</description>
  <parent>
    <tag id="-1" href="/api/tags/-1"/>
  </parent>
</tag>
```

24.3. ASSOCIATING TAGS

24.3.1. Associating Tags With a Host, User or VM

The collection referenced by `link rel="tags"` from a **host**, **user** or **vms** represents the set of tags associated with the entity.

These **tag** representations also contain a **host id**, **user id** or **vm id** reference to the entity in question.
Associating a tag with an entity is achieved by **POST**ing a tag reference (identifying the tag either by its **id** or **name**) to the collection.

### Example 24.2. Associating a tag with a virtual machine

```text
POST /api/vms/5114bb3e-a4e6-44b2-b783-b3eea7d84720/tags HTTP/1.1
Accept: application/xml
Content-Type: application/xml

<tag>
   <name>Finance</name>
</tag>

HTTP/1.1 201 Created
Content-Type: application/xml

<tag id="f436ebfc-67f2-41bd-8ec6-902b6f7dcb5e"
     href="/api/vms/5114bb3e-a4e6-44b2-b783-b3eea7d84720/tags/f436ebfc-67f2-41bd-8ec6-902b6f7dcb5e">
   <name>Finance</name>
   <description>Resources for the Finance department</description>
   <vm id="5114bb3e-a4e6-44b2-b783-b3eea7d84720"
       href="/api/vms/5114bb3e-a4e6-44b2-b783-b3eea7d84720"/>
</tag>
```

### 24.3.2. Removing a Tag

Removing an association is achieved with a **DELETE** request to the appropriate element in the collection.

### Example 24.3. Removing a tag from a virtual machine

```text
DELETE /api/vms/5114bb3e-a4e6-44b2-b783-b3eea7d84720/tags/f436ebfc-67f2-41bd-8ec6-902b6f7dcb5e HTTP/1.1

HTTP/1.1 204 No Content
```

### 24.3.3. Querying a Collection for Tagged Resources

To query the set of entities associated with a given tag, the `collection/search` URI template for the appropriate collection should be used to search for entities matching `tag=MyTag`.

### Example 24.4. Querying a collection for tagged resources

```text
GET /api/vms?search=tag%3DFinance HTTP/1.1
Accept: application/xml

HTTP/1.1 200 OK
Content-Type: application/xml

<vms>
   <vm id="5114bb3e-a4e6-44b2-b783-b3eea7d84720"
```
24.4. PARENT TAGS

24.4.1. Parent Tags

An API user assigns a parent element to a tag to create a hierarchical link to a parent tag. The tags are presented as a flat collection, which descends from the root tag, with tag representations containing a link element to a parent tag.

**NOTE**

The root tag is a special pseudo-tag assumed as the default parent tag if no parent tag is specified. The root tag cannot be deleted nor assigned a parent tag.

This tag hierarchy is expressed in the following way:

**Example 24.5. Tag Hierarchy**

```xml
<tags>
  <tag id="-1" href="/api/tags/-1">
    <name>root</name>
    <description>root</description>
    <parent>
      <tag id="-1" href="/api/tags/-1"/>
    </parent>
  </tag>
  <tag id="f436ebfc-67f2-41bd-8ec6-902b6f7dcb5e" href="/api/tags/f436ebfc-67f2-41bd-8ec6-902b6f7dcb5e">
    <name>Finance</name>
    <description>Resources for the Finance department</description>
    <parent>
      <tag id="f436ebfc-67f2-41bd-8ec6-902b6f7dcb5e"/>
    </parent>
  </tag>
  <tag id="ac18dabf-23e5-12be-a383-a38b165ca7bd" href="/api/tags/ac18dabf-23e5-12be-a383-a38b165ca7bd">
    <name>Billing</name>
    <description>Billing Resources</description>
    <parent>
      <tag id="f436ebfc-67f2-41bd-8ec6-902b6f7dcb5e"/>
    </parent>
  </tag>
</tags>
```

In this XML representation, the tags follow this hierarchy:
24.4.2. Setting a Parent Tag

POSTing a new tag with a parent element creates an association with a parent tag, using either the id attribute or the name element to reference the parent tag.

Example 24.6. Setting an association with a parent tag with the id attribute

```
POST /api/vms/5114bb3e-a4e6-44b2-b783-b3eea7d84720/tags HTTP/1.1
Accept: application/xml
Content-Type: application/xml

HTTP/1.1 200 OK
Content-Type: application/xml

<tag>
  <name>Billing</name>
  <description>Billing Resources</description>
  <parent>
    <tag id="f436ebfc-67f2-41bd-8ec6-902b6f7dcb5e"/>
  </parent>
</tag>
```

Example 24.7. Setting an association with a parent tag with the name element

```
POST /api/vms/5114bb3e-a4e6-44b2-b783-b3eea7d84720/tags HTTP/1.1
Accept: application/xml
Content-Type: application/xml

HTTP/1.1 200 OK
Content-Type: application/xml

<tag>
  <name>Billing</name>
  <description>Billing Resources</description>
  <parent>
    <tag>
      <name>Finance</name>
    </tag>
  </parent>
</tag>
```

24.4.3. Changing a Parent Tag

A tag changes a parent using a PUT request:
Example 24.8. Changing the parent tag

```plaintext
PUT /api/tags/ac10dabf-23e5-12be-a383-a38b165ca7bd HTTP/1.1
Accept: application/xml
Content-Type: application/xml

<tag>
  <parent>
    <tag id="f436ebfc-67f2-41bd-8ec6-902b6f7dcb5e"/>
  </parent>
</tag>
```
CHAPTER 25. EVENTS

25.1. EVENT ELEMENTS

The rel="events" link obtained from the entry point URI accesses the events collection and lists system events from Red Hat Enterprise Virtualization Manager.

Table 25.1. Event elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>description</td>
<td>string</td>
<td>A description of the system event</td>
</tr>
<tr>
<td>code</td>
<td>integer</td>
<td>The integer event code.</td>
</tr>
<tr>
<td>severity</td>
<td>One of normal, warning, error or alert</td>
<td>The level of severity for the event.</td>
</tr>
<tr>
<td>time</td>
<td>xsd:dateTime format: YYYY-MM-DDThh:mm:ss</td>
<td>The timestamp indicating when the event happened.</td>
</tr>
<tr>
<td>correlation_id</td>
<td>string</td>
<td>The identification string for an action that is spread across layers of Red Hat Enterprise Virtualization.</td>
</tr>
<tr>
<td>user_id=</td>
<td>GUID</td>
<td>The identification code for the user who triggered the event.</td>
</tr>
<tr>
<td>origin</td>
<td>string</td>
<td>The source of the event. Standard events are reported by oVirt.</td>
</tr>
<tr>
<td>custom_id</td>
<td>integer</td>
<td>A custom identification number for custom events. Standard events have a custom_id of -1.</td>
</tr>
<tr>
<td>flood_rate</td>
<td>integer</td>
<td>The time, in seconds, during which the same event cannot reoccur in the event list. The default value is 30.</td>
</tr>
<tr>
<td>external_status</td>
<td>complex</td>
<td>The external health status of a host. Contains the state element, which can be one of ok, info, error, warning, or failure.</td>
</tr>
</tbody>
</table>

25.2. XML REPRESENTATION OF THE EVENTS COLLECTION

Example 25.1. An XML representation of the events collection

```xml
<events>
  <event id="537" href="/api/events/537">
    ...
  </event>
</events>
```
25.3. XML REPRESENTATION OF A VIRTUAL MACHINE CREATION EVENT

In addition to user, an event representation also contains a set of XML element relationships to resources relevant to the event.

Example 25.2. An XML representation of a virtual machine creation event

```
<event id="635" href="/api/events/635">
  <description>VM bar was created by rhevadmin.</description>
  <code>34</code>
  <severity>normal</severity>
  <time>2011-07-11T16:32:03.172+02:00</time>
  <user id="4621b611-43eb-4d2b-ae5f-1180850268c4" href="/api/users/4621b611-43eb-4d2b-ae5f-1180850268c4"/>
  <vm id="9b22d423-e16b-4dd8-9c06-c8e9358fbc66" href="/api/vms/9b22d423-e16b-4dd8-9c06-c8e9358fbc66"/>
  <storage_domain id="a8a0e93d-c570-45ab-9cd6-3c68ab31221f" href="/api/storagedomains/a8a0e93d-c570-45ab-9cd6-3c68ab31221f"/>
</event>
```

This example representation provides XML element relationships to a virtual machine resource and a storage domain resource.

25.4. METHODS

25.4.1. Searching Events

The events collection provides search queries similar to other resource collections. An additional feature when searching the events collection is the ability to search from a certain event. This queries all of events since a specified event.

Querying from an event requires an additional from parameter added before the search query. This from argument references an event id code.

Example 25.3. Searching from an event

```
GET /api/events;from=1012?search=type%3D30 HTTP/1.1
Accept: application/xml
```
This displays all events with **type** set to 30 since **id="1012"**

```xml
<events>
  <event id="1018" href="/api/events/1018">
    <description>User admin logged in.</description>
    <code>30</code>
    <severity>normal</severity>
    <time>2011-07-11T14:03:22.485+10:00</time>
    <user id="80b71bae-98a1-11e0-8f20-525400866c73" href="/api/users/80b71bae-98a1-11e0-8f20-525400866c73"/>
  </event>
  <event id="1016" href="/api/events/1016">
    <description>User admin logged in.</description>
    <code>30</code>
    <severity>normal</severity>
    <time>2011-07-11T14:03:07.236+10:00</time>
    <user id="80b71bae-98a1-11e0-8f20-525400866c73" href="/api/users/80b71bae-98a1-11e0-8f20-525400866c73"/>
  </event>
  <event id="1014" href="/api/events/1014">
    <description>User admin logged in.</description>
    <code>30</code>
    <severity>normal</severity>
    <time>2011-07-11T14:02:16.009+10:00</time>
    <user id="80b71bae-98a1-11e0-8f20-525400866c73" href="/api/users/80b71bae-98a1-11e0-8f20-525400866c73"/>
  </event>
</events>
```

**Example 25.4. Searching using a specific event severity**

```
GET /api/events?search=severity>normal HTTP/1.1
Accept: application/xml
```

This displays all events with severity higher than **normal**. Severity levels include **normal**, **warning**, **error** and **alert**.

```xml
<events>
  <event id="2823" href="/api/events/2823">
    <description>Host Host-05 has time-drift of 36002 seconds while maximum configured value is 300 seconds.</description>
    <code>604</code>
    <severity>warning</severity>
    <time>2015-07-11T14:03:22.485+10:00</time>
    <host href="/api/hosts/44e52bb2-27d6-4d35-8038-0c4b4db89789" id="44e52bb2-27d6-4d35-8038-0c4b4db89789"/>
    <cluster href="/api/clusters/00000021b" id="00000021b"/>
    <origin>oVirt</origin>
  </event>
</events>
```
25.4.2. Paginating Events

A virtualization environment generates a large amount of events after a period of time. However, the API only displays a default number of events for one search query. To display more than the default, the API separates results into pages with the \texttt{page} command in a search query.

The following search query tells the API to paginate results using a \texttt{page} value in combination with the \texttt{sortby} clause:

\begin{verbatim}
  sortby time asc page 1
\end{verbatim}

The \texttt{sortby} clause defines the base element to order of the results and whether the results are ascending or descending. For search queries of \texttt{events}, set the base element to \texttt{time} and the order to ascending (\texttt{asc}) so the API displays all events from the creation of your virtualization environment.

The \texttt{page} condition defines the page number. One page equals the default number of events to list. Pagination begins at \texttt{page 1}. To view more pages, increase the \texttt{page} value:

\begin{verbatim}
  sortby time asc page 2
  sortby time asc page 3
  sortby time asc page 4
\end{verbatim}

\textbf{Example 25.5. Paginating events}

This example paginates \texttt{event} resources. The URL-encoded request is:

\begin{verbatim}
GET /api/events?search=sortby%20time%20asc%20page%201 HTTP/1.1
Accept: application/xml
\end{verbatim}

Increase the \texttt{page} value to view the next page of results.

\begin{verbatim}
GET /api/events?search=sortby%20time%20asc%20page%202 HTTP/1.1
Accept: application/xml
\end{verbatim}

Use an additional \texttt{from} argument to set the starting \texttt{id}.

\begin{verbatim}
GET /api/events?search=sortby%20time%20asc%20page%202&from=30 HTTP/1.1
Accept: application/xml
\end{verbatim}

25.4.3. Adding Events

The API can add custom events with a \texttt{POST} request to the \texttt{events} collection. A new event requires the
description, severity, origin, and custom_id elements. Custom events can also include flood_rate, user_id, and the id codes of any resources relevant to the event. host and storage_domain elements can contain the external_status element to set an external health status.

Example 25.6. Adding a custom event to the event list

```xml
POST /api/events HTTP/1.1
Accept: application/xml
Content-type: application/xml

<event>
  <description>The heat of the host is above 30 Oc</description>
  <severity>warning</severity>
  <origin>HP Openview</origin>
  <custom_id>1</custom_id>
  <flood_rate>30</flood_rate>
  <host id="f59a29cd-587d-48a3-b72a-db537eb21957" >
    <external_status>
      <state>warning</state>
    </external_status>
  </host>
</event>
```

25.4.4. Removing Events

Removal of an event from the event list requires a DELETE request.

Example 25.7. Removing an event

```plaintext
DELETE /api/events/1705 HTTP/1.1
HTTP/1.1 204 No Content
```
APPENDIX A. API USAGE WITH CURL

A.1. API USAGE WITH CURL

This appendix provides instructions on adapting REST requests for use with cURL. cURL is a command line tool for transferring data across various protocols, including HTTP, and supports multiple platforms such as Linux, Windows, Mac and Solaris. Most Linux distributions include cURL as a package.

A.2. INSTALLING CURL

A Red Hat Enterprise Linux user installs cURL with the following terminal command:

```
yum install curl
```

For other platforms, seek installation instructions on the cURL website (http://curl.haxx.se/).

A.3. USING CURL

cURL uses a command line interface to send requests to a HTTP server. Integrating a request requires the following command syntax:

```
Usage: curl [options] uri
```

The uri refers to target HTTP address to send the request. This is a location on your Red Hat Enterprise Virtualization Manager host within the API entry point path (/api).

cURL options

- `-X COMMAND, --request COMMAND`
  The request command to use. In the context of the REST API, use GET, POST, PUT or DELETE.

  Example: `-X GET`

- `-H LINE, --header LINE`
  HTTP header to include with the request. Use multiple header options if more than one header is required.

  Example: `-H "Accept: application/xml" -H "Content-Type: application/xml"

- `-u USERNAME:PASSWORD, --user USERNAME:PASSWORD`
  The user name and password of the Red Hat Enterprise Virtualization user. This attribute acts as a convenient replacement for the Authorization: header.

  Example: `-u admin@internal:p@55w0rd!`

- `--cacert CERTIFICATE`
  The location of the certificate file for SSL communication to the REST API. The certificate file is saved locally on the client machine. Use the -k attribute to bypass SSL.

  Example: `--cacert ~/Certificates/rhevm.cer`
**A.4. EXAMPLES**

**A.4.1. GET Request with cURL**

**Example A.1. GET request**

The following GET request lists the virtual machines in the `vms` collection. Note that a GET request does not contain a body.

```
GET /api/vms HTTP/1.1
Accept: application/xml
```

Adapt the method (GET), header (Accept: application/xml) and URI (`https://[RHEVM-Host]:443/api/vms`) into the following cURL command:

```
```

An XML representation of the `vms` collection displays.

**A.4.2. POST Request with cURL**

**Example A.2. POST request**

The following POST request creates a virtual machine in the `vms` collection. Note that a POST request requires a body.

```
POST /api/vms HTTP/1.1
Accept: application/xml
Content-type: application/xml
```

```
<vm>
  <name>vm1</name>
  <cluster>
    <name>default</name>
  </cluster>
  <template>
    <name>Blank</name>
  </template>
  <memory>536870912</memory>
  <os>
    <boot dev="hd"/>
  </os>
</vm>
```
Adapt the method (POST), headers (Accept: application/xml and Content-type: application/xml), URI (https://[RHEVM-Host]:443/api/vms) and request body into the following cURL command:

```
  <name>vm1</name>
  <cluster><name>default</name></cluster>
  <template><name>Blank</name></template>
  <memory>536870912</memory>
  <os><boot dev='hd'/></os></vm>" https://[RHEVM-Host]:443/api/vms
```

The REST API creates a new virtual machine and displays an XML representation of the resource.

### A.4.3. PUT Request with cURL

**Example A.3. PUT request**

The following PUT request updates the memory of a virtual machine resource. Note that a PUT request requires a body.

```
PUT /api/vms/082c794b-771f-452f-83c9-b2b5a19c0399 HTTP/1.1
Accept: application/xml
Content-type: application/xml

<vm>
  <memory>1073741824</memory>
</vm>
```

Adapt the method (PUT), headers (Accept: application/xml and Content-type: application/xml), URI (https://[RHEVM-Host]:443/api/vms/082c794b-771f-452f-83c9-b2b5a19c0399) and request body into the following cURL command:

```
  <memory>1073741824</memory>
</vm>" https://[RHEVM-Host]:443/api/vms/082c794b-771f-452f-83c9-b2b5a19c0399
```

The REST API updates the virtual machine with a new memory configuration.

### A.4.4. DELETE Request with cURL

**Example A.4. DELETE request**

The following DELETE request removes a virtual machine resource.

```
DELETE /api/vms/082c794b-771f-452f-83c9-b2b5a19c0399 HTTP/1.1
```

Adapt the method (DELETE) and URI (https://[RHEVM-Host]:443/api/vms/082c794b-771f-452f-83c9-b2b5a19c0399) into the following cURL command:

```
$ curl -X DELETE -u [USER:PASS] --cacert [CERT] https://[RHEVM-
The REST API removes the virtual machine. Note the `Accept: application/xml` request header is optional due to the empty result of DELETE requests.

### A.4.5. DELETE Request Including Body with cURL

**Example A.5. DELETE request with body**

The following DELETE request force removes a virtual machine resource as indicated with the optional body.

```
DELETE /api/vms/082c794b-771f-452f-83c9-b2b5a19c0399 HTTP/1.1
Accept: application/xml
Content-type: application/xml

<action>
  <force>true</force>
</action>
```

Adapt the method (DELETE), headers (Accept: application/xml and Content-type: application/xml), URI (https://[RHEVM-Host]:443/api/vms/082c794b-771f-452f-83c9-b2b5a19c0399) and request body into the following cURL command:

```
  <force>true</force></action>" https://[RHEVM-Host]:443/api/vms/082c794b-771f-452f-83c9-b2b5a19c039
```

The REST API force removes the virtual machine.
APPENDIX B. ENUMERATED VALUE TRANSLATION

B.1. ENUMERATED VALUE TRANSLATION

The API uses Red Hat Enterprise Virtualization Query Language to perform search queries. For more information on the Query Language, read the full specification in Performing Searches in Red Hat Enterprise Virtualization of the Red Hat Enterprise Virtualization Administration Guide.

Note that certain enumerated values in the API require a different search query when using the Query Language. The following table provides a translation for these key enumerated values.

Table B.1. Enumerated Value Translations

<table>
<thead>
<tr>
<th>Resource Type</th>
<th>API Enumerable Type</th>
<th>API Enumerable Value</th>
<th>Query Language Property</th>
<th>Query Language Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Centers</td>
<td>data_center_states</td>
<td>not_operational</td>
<td>status</td>
<td>notoperation</td>
</tr>
<tr>
<td>Hosts</td>
<td>host_states</td>
<td>non_responsive</td>
<td>status</td>
<td>nonresponsive</td>
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<td>API Enumerable Value</td>
<td>Query Language Property</td>
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</table>
## APPENDIX C. EVENT CODES

### C.1. EVENT CODES

This table lists all event codes.

**Table C.1. Event codes**

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
<th>Severity</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>UNASSIGNED</td>
<td>Info</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>VDC_START</td>
<td>Info</td>
<td>Starting oVirt Engine.</td>
</tr>
<tr>
<td>2</td>
<td>VDC_STOP</td>
<td>Info</td>
<td>Stopping oVirt Engine.</td>
</tr>
<tr>
<td>12</td>
<td>VDS_FAILURE</td>
<td>Error</td>
<td>Host ${VdsName} is non responsive.</td>
</tr>
<tr>
<td>13</td>
<td>VDS_DETECTED</td>
<td>Info</td>
<td>Status of host ${VdsName} was set to ${HostStatus}.</td>
</tr>
<tr>
<td>14</td>
<td>VDS_RECOVER</td>
<td>Info</td>
<td>Host ${VdsName} is rebooting.</td>
</tr>
<tr>
<td>15</td>
<td>VDS_MAINTENANCE</td>
<td>Normal</td>
<td>Host ${VdsName} was switched to Maintenance Mode.</td>
</tr>
<tr>
<td>16</td>
<td>VDS_ACTIVATE</td>
<td>Info</td>
<td>Activation of host ${VdsName} initiated by ${UserName}.</td>
</tr>
<tr>
<td>17</td>
<td>VDS_MAINTENANCE_FAILED</td>
<td>Error</td>
<td>Failed to switch Host ${VdsName} to Maintenance mode.</td>
</tr>
<tr>
<td>18</td>
<td>VDS_ACTIVATE_FAILED</td>
<td>Error</td>
<td>Failed to activate Host ${VdsName}. (User: ${UserName}).</td>
</tr>
<tr>
<td>19</td>
<td>VDS_RECOVER_FAILED</td>
<td>Error</td>
<td>Host ${VdsName} failed to recover.</td>
</tr>
<tr>
<td>20</td>
<td>USER_VDS_START</td>
<td>Info</td>
<td>Host ${VdsName} was started by ${UserName}.</td>
</tr>
<tr>
<td>21</td>
<td>USER_VDS_STOP</td>
<td>Info</td>
<td>Host ${VdsName} was stopped by ${UserName}.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>22</td>
<td>IRS_FAILURE</td>
<td>Error</td>
<td>Failed to access Storage on Host ${VdsName}.</td>
</tr>
<tr>
<td>23</td>
<td>VDS_LOW_DISK_SPACE</td>
<td>Warning</td>
<td>Warning, Low disk space. Host ${VdsName} has less than ${DiskSpace} MB of free space left on: ${Disks}.</td>
</tr>
<tr>
<td>24</td>
<td>VDS_LOW_DISK_SPACE_ERROR</td>
<td>Error</td>
<td>Critical, Low disk space. Host ${VdsName} has less than ${DiskSpace} MB of free space left on: ${Disks}. Low disk space might cause an issue upgrading this host.</td>
</tr>
<tr>
<td>25</td>
<td>VDS_NO_SELINUX_ENFORCEMENT</td>
<td>Warning</td>
<td>Host ${VdsName} does not enforce SELinux. Current status: ${Mode}</td>
</tr>
<tr>
<td>26</td>
<td>IRS_DISK_SPACE_LOW</td>
<td>Warning</td>
<td>Warning, Low disk space. ${StorageDomainName} domain has ${DiskSpace} GB of free space.</td>
</tr>
<tr>
<td>27</td>
<td>VDS_STATUS_CHANGE_FAILED_DUE_TO_STOP_SPM_FAILURE</td>
<td>Warning</td>
<td>Failed to change status of host ${VdsName} due to a failure to stop the spm.</td>
</tr>
<tr>
<td>28</td>
<td>VDS_PROVISION</td>
<td>Warning</td>
<td>Installing OS on Host ${VdsName} using Hostgroup ${HostGroupName}.</td>
</tr>
<tr>
<td>29</td>
<td>USER_ADD_VM_TEMPLATE_SUCCESS</td>
<td>Info</td>
<td>Template ${VmTemplateName} was created successfully.</td>
</tr>
<tr>
<td>31</td>
<td>USER_VDC_LOGOUT</td>
<td>Info</td>
<td>User ${UserName} logged out.</td>
</tr>
<tr>
<td>32</td>
<td>USER_RUN_VM</td>
<td>Info</td>
<td>VM ${VmName} started on Host ${VdsName}</td>
</tr>
<tr>
<td>33</td>
<td>USER_STOP_VM</td>
<td>Info</td>
<td>VM ${VmName} powered off by ${UserName} (Host: ${VdsName}) (Reason: ${Reason}).</td>
</tr>
<tr>
<td>34</td>
<td>USER_ADD_VM</td>
<td>Info</td>
<td>VM ${VmName} was created by ${UserName}.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>35</td>
<td>USER_UPDATE_VM</td>
<td>Info</td>
<td>VM ${VmName} configuration was updated by ${UserName}.</td>
</tr>
<tr>
<td>36</td>
<td>USER_ADD_VM_TEMPLATE_FAILURE</td>
<td>Error</td>
<td>Failed creating Template ${VmTemplateName}.</td>
</tr>
<tr>
<td>37</td>
<td>USER_ADD_VM_STARTED</td>
<td>Info</td>
<td>VM ${VmName} creation was initiated by ${UserName}.</td>
</tr>
<tr>
<td>38</td>
<td>USER_CHANGE_DISK_VM</td>
<td>Info</td>
<td>CD ${DiskName} was inserted to VM ${VmName} by ${UserName}.</td>
</tr>
<tr>
<td>39</td>
<td>USER_PAUSE_VM</td>
<td>Info</td>
<td>VM ${VmName} was suspended by ${UserName} (Host: ${VdsName}).</td>
</tr>
<tr>
<td>40</td>
<td>USER_RESUME_VM</td>
<td>Info</td>
<td>VM ${VmName} was resumed by ${UserName} (Host: ${VdsName}).</td>
</tr>
<tr>
<td>41</td>
<td>USER_VDS_RESTART</td>
<td>Info</td>
<td>Host ${VdsName} was restarted by ${UserName}.</td>
</tr>
<tr>
<td>42</td>
<td>USER_ADD_VDS</td>
<td>Info</td>
<td>Host ${VdsName} was added by ${UserName}.</td>
</tr>
<tr>
<td>43</td>
<td>USER_UPDATE_VDS</td>
<td>Info</td>
<td>Host ${VdsName} configuration was updated by ${UserName}.</td>
</tr>
<tr>
<td>44</td>
<td>USER_REMOVE_VDS</td>
<td>Info</td>
<td>Host ${VdsName} was removed by ${UserName}.</td>
</tr>
<tr>
<td>45</td>
<td>USER_CREATE_SNAPSHOT</td>
<td>Info</td>
<td>Snapshot '${SnapshotName}' creation for VM '${VmName}' was initiated by ${UserName}.</td>
</tr>
<tr>
<td>46</td>
<td>USER_TRY_BACK_TO_SNAPSHOT</td>
<td>Info</td>
<td>Snapshot-Preview ${SnapshotName} for VM ${VmName} was initiated by ${UserName}.</td>
</tr>
<tr>
<td>47</td>
<td>USER_RESTORE_FROM_SNAPSHOT</td>
<td>Info</td>
<td>VM ${VmName} restored from Snapshot by ${UserName}.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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</tr>
<tr>
<td>48</td>
<td>USER_ADD_VM_TEMPLATE</td>
<td>Info</td>
<td>Creation of Template ${VmTemplateName} from VM ${VmName} was initiated by ${UserName}.</td>
</tr>
<tr>
<td>49</td>
<td>USER_UPDATE_VM_TEMPLATE</td>
<td>Info</td>
<td>Template ${VmTemplateName} configuration was updated by ${UserName}.</td>
</tr>
<tr>
<td>50</td>
<td>USER_REMOVE_VM_TEMPLATE</td>
<td>Info</td>
<td>Removal of Template ${VmTemplateName} was initiated by ${UserName}.</td>
</tr>
<tr>
<td>51</td>
<td>USER_ADD_VM_TEMPLATE_FINISHED_SUCCESS</td>
<td>Info</td>
<td>Creation of Template ${VmTemplateName} from VM ${VmName} has been completed.</td>
</tr>
<tr>
<td>52</td>
<td>USER_ADD_VM_TEMPLATE_FINISHED_FAILURE</td>
<td>Error</td>
<td>Failed to complete creation of Template ${VmTemplateName} from VM ${VmName}.</td>
</tr>
<tr>
<td>53</td>
<td>USER_ADD_VM_FINISHED_SUCCESS</td>
<td>Info</td>
<td>VM ${VmName} creation has been completed.</td>
</tr>
<tr>
<td>54</td>
<td>USER_FAILED_RUN_VM</td>
<td>Error</td>
<td>Failed to run VM ${VmName} (User: ${UserName}).</td>
</tr>
<tr>
<td>55</td>
<td>USER_FAILED_PAUSE_VM</td>
<td>Error</td>
<td>Failed to suspend VM ${VmName} (Host: ${VdsName}, User: ${UserName}).</td>
</tr>
<tr>
<td>56</td>
<td>USER_FAILED_STOP_VM</td>
<td>Error</td>
<td>Failed to power off VM ${VmName} (Host: ${VdsName}, User: ${UserName}).</td>
</tr>
<tr>
<td>57</td>
<td>USER_FAILED_ADD_VM</td>
<td>Error</td>
<td>Failed to create VM ${VmName} (User: ${UserName}).</td>
</tr>
<tr>
<td>58</td>
<td>USER_FAILED_UPDATE_VM</td>
<td>Error</td>
<td>Failed to update VM ${VmName} (User: ${UserName}).</td>
</tr>
<tr>
<td>59</td>
<td>USER_FAILED_REMOVE_VM</td>
<td>Error</td>
<td></td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
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<tr>
<td>60</td>
<td>USER_ADD_VM_FINISHED_FAILURE</td>
<td>Error</td>
<td>Failed to complete VM ${VmName} creation.</td>
</tr>
<tr>
<td>61</td>
<td>VM_DOWN</td>
<td>Info</td>
<td>VM ${VmName} is down. ${ExitMessage}</td>
</tr>
<tr>
<td>62</td>
<td>VM_MIGRATION_START</td>
<td>Info</td>
<td>Migration started (VM: ${VmName}, Source: ${VdsName}, Destination: ${DestinationVdsName}, User: ${UserName}).</td>
</tr>
<tr>
<td>63</td>
<td>VM_MIGRATION_DONE</td>
<td>Info</td>
<td>Migration completed (VM: ${VmName}, Source: ${VdsName}, Destination: ${DestinationVdsName}, Duration: ${Duration}, Total: ${TotalDuration}, Actual downtime: ${ActualDowntime}).</td>
</tr>
<tr>
<td>64</td>
<td>VM_MIGRATION_ABORT</td>
<td>Error</td>
<td>Migration failed: ${MigrationError} (VM: ${VmName}, Source: ${VdsName}, Destination: ${DestinationVdsName}).</td>
</tr>
<tr>
<td>65</td>
<td>VM_MIGRATION_FAILED</td>
<td>Error</td>
<td>Migration failed${DueToMigrationError} (VM: ${VmName}, Source: ${VdsName}).</td>
</tr>
<tr>
<td>66</td>
<td>VM_FAILURE</td>
<td>Error</td>
<td>VM ${VmName} cannot be found on Host ${VdsName}.</td>
</tr>
<tr>
<td>67</td>
<td>VM_MIGRATION_START.SYSTEM_INITIATED</td>
<td>Info</td>
<td>Migration initiated by system (VM: ${VmName}, Source: ${VdsName}, Destination: ${DestinationVdsName}).</td>
</tr>
<tr>
<td>68</td>
<td>USER_CREATE_SNAPSHOT_FINISHED_SUCCESS</td>
<td>Info</td>
<td>Snapshot '${SnapshotName}' creation for VM '${VmName}' has been completed.</td>
</tr>
<tr>
<td>69</td>
<td>USER_CREATE_SNAPSHOT_FINISHED_FAILURE</td>
<td>Error</td>
<td>Failed to complete snapshot '${SnapshotName}' creation for VM '${VmName}'.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
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<tr>
<td>70</td>
<td>USER_RUN_VM_AS_STATE_LESS_FINISHED_FAILUERE</td>
<td>Error</td>
<td>Failed to complete starting of VM ${VmName}.</td>
</tr>
<tr>
<td>71</td>
<td>USER_TRY_BACK_TO_SNAPSHOT_FINISH_SUCCESS</td>
<td>Info</td>
<td>Snapshot-Preview ${SnapshotName} for VM ${VmName} has been completed.</td>
</tr>
<tr>
<td>72</td>
<td>USER_CHANGE_FLOPPY_VM</td>
<td>Info</td>
<td>Floppy ${DiskName} was inserted in VM ${VmName} by ${UserName}</td>
</tr>
<tr>
<td>73</td>
<td>USER_INITIATED_SHUTDOWN_VM</td>
<td>Info</td>
<td>VM shutdown initiated by ${UserName} on VM ${VmName} (Host: ${VdsName}) (Reason: ${Reason}).</td>
</tr>
<tr>
<td>74</td>
<td>USER_FAILED_SHUTDOWN_VM</td>
<td>Error</td>
<td>Failed to initiate shutdown on VM ${VmName} (Host: ${VdsName}, User: ${UserName}).</td>
</tr>
<tr>
<td>75</td>
<td>USER_FAILED_CHANGE_FLOPPY_VM</td>
<td>Error</td>
<td>Failed to change floppy ${DiskName} (User: ${UserName}).</td>
</tr>
<tr>
<td>76</td>
<td>USER_STOPPED_VM_INSTEAD_OF_SHUTDOWN</td>
<td>Info</td>
<td>VM ${VmName} was powered off ungracefully by ${UserName} (Host: ${VdsName}) (Reason: ${Reason}).</td>
</tr>
<tr>
<td>77</td>
<td>USER_FAILED_STOPPING_VM_INSTEAD_OF_SHUTDOWN</td>
<td>Error</td>
<td>Failed to power off VM ${VmName} (Host: ${VdsName}, User: ${UserName}).</td>
</tr>
<tr>
<td>78</td>
<td>USER_ADD_DISK_TO_VM</td>
<td>Info</td>
<td>Add-Disk operation of ${DiskAlias} was initiated on VM ${VmName} by ${UserName}.</td>
</tr>
<tr>
<td>79</td>
<td>USER_FAILED_ADD_DISK_TO_VM</td>
<td>Error</td>
<td>Add-Disk operation failed on VM ${VmName} (User: ${UserName}).</td>
</tr>
<tr>
<td>80</td>
<td>USER_REMOVE_DISK_FROM_VM</td>
<td>Info</td>
<td>Disk was removed from VM ${VmName} by ${UserName}.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>81</td>
<td>USER_FAILED_REMOVE_DISK_FROM_VM</td>
<td>Error</td>
<td>Failed to remove Disk from VM ${VmName} (User: ${UserName}).</td>
</tr>
<tr>
<td>82</td>
<td>USER_MOVED_VM</td>
<td>Info</td>
<td>VM ${VmName} moving to Domain ${StorageDomainName} was initiated by ${UserName}.</td>
</tr>
<tr>
<td>83</td>
<td>USER_FAILED_MOVE_VM</td>
<td>Error</td>
<td>Failed to initiate moving of VM ${VmName} to Domain ${StorageDomainName} (User: ${UserName}).</td>
</tr>
<tr>
<td>84</td>
<td>USER_MOVED_TEMPLATE</td>
<td>Info</td>
<td>Template ${VmTemplateName} moving to Domain ${StorageDomainName} was initiated by ${UserName}.</td>
</tr>
<tr>
<td>85</td>
<td>USER_FAILED_MOVE_TEMPLATE</td>
<td>Error</td>
<td>Failed to initiate moving Template ${VmTemplateName} to Domain ${StorageDomainName} (User: ${UserName}).</td>
</tr>
<tr>
<td>86</td>
<td>USER_COPIED_TEMPLATE</td>
<td>Info</td>
<td>Template ${VmTemplateName} copy to Domain ${StorageDomainName} was initiated by ${UserName}.</td>
</tr>
<tr>
<td>87</td>
<td>USER_FAILED_COPY_TEMPLATE</td>
<td>Error</td>
<td>Failed to initiate copy of Template ${VmTemplateName} to Domain ${StorageDomainName} (User: ${UserName}).</td>
</tr>
<tr>
<td>88</td>
<td>USER_UPDATE_VM_DISK</td>
<td>Info</td>
<td>VM ${VmName} ${DiskAlias} disk was updated by ${UserName}.</td>
</tr>
<tr>
<td>89</td>
<td>USER_FAILED_UPDATE_VM_DISK</td>
<td>Error</td>
<td>Failed to update VM ${VmName} disk ${DiskAlias} (User: ${UserName}).</td>
</tr>
<tr>
<td>90</td>
<td>VDS_FAILED_TO_GET_HOST_HARDWARE_INFO</td>
<td>Warning</td>
<td>Could not get hardware information for host ${VdsName}</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
<td>--------</td>
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<td>----------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>91</td>
<td>USER_MOVED_VM_FINISHED_SUCCESS</td>
<td>Info</td>
<td>Moving VM <code>${VmName}</code> to Domain <code>${StorageDomainName}</code> has been completed.</td>
</tr>
<tr>
<td>92</td>
<td>USER_MOVED_VM_FINISHED_FAILURE</td>
<td>Error</td>
<td>Failed to complete moving of VM <code>${VmName}</code> to Domain <code>${StorageDomainName}</code>.</td>
</tr>
<tr>
<td>93</td>
<td>USER_MOVED_TEMPLATE_FINISHED_SUCCESS</td>
<td>Info</td>
<td>Template <code>${VmTemplateName}</code> moving to Domain <code>${StorageDomainName}</code> has been completed.</td>
</tr>
<tr>
<td>94</td>
<td>USER_MOVED_TEMPLATE_FINISHED_FAILURE</td>
<td>Error</td>
<td>Failed to complete moving of Template <code>${VmTemplateName}</code> to Domain <code>${StorageDomainName}</code>.</td>
</tr>
<tr>
<td>95</td>
<td>USER_COPIED_TEMPLATE_FINISHED_SUCCESS</td>
<td>Info</td>
<td>Template <code>${VmTemplateName}</code> copy to Domain <code>${StorageDomainName}</code> has been completed.</td>
</tr>
<tr>
<td>96</td>
<td>USER_COPIED_TEMPLATE_FINISHED_FAILURE</td>
<td>Error</td>
<td>Failed to complete copy of Template <code>${VmTemplateName}</code> to Domain <code>${StorageDomainName}</code>.</td>
</tr>
<tr>
<td>97</td>
<td>USER_ADD_DISK_TO_VM_FINISHED_SUCCESS</td>
<td>Info</td>
<td>The disk <code>${DiskAlias}</code> was successfully added to VM <code>${VmName}</code>.</td>
</tr>
<tr>
<td>98</td>
<td>USER_ADD_DISK_TO_VM_FINISHED_FAILURE</td>
<td>Error</td>
<td>Add-Disk operation failed to complete on VM <code>${VmName}</code>.</td>
</tr>
<tr>
<td>99</td>
<td>USER_TRY_BACK_TO_SNAPSHOT_FINISH_FAILURE</td>
<td>Error</td>
<td>Failed to complete Snapshot-Preview <code>${SnapshotName}</code> for VM <code>${VmName}</code>.</td>
</tr>
<tr>
<td>100</td>
<td>USER_RESTORE_FROM_SNAPSHOT_FINISH_SUCCESS</td>
<td>Info</td>
<td>VM <code>${VmName}</code> restoring from Snapshot has been completed.</td>
</tr>
<tr>
<td>101</td>
<td>USER_RESTORE_FROM_SNAPSHOT_FINISH_FAILURE</td>
<td>Error</td>
<td>Failed to complete restoring from Snapshot of VM <code>${VmName}</code>.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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</tr>
<tr>
<td>102</td>
<td>USER_FAILED_CHANGE_DISK_VM</td>
<td>Error</td>
<td>Failed to change disk in VM ${VmName} (Host: ${VdsName}, User: ${UserName}).</td>
</tr>
<tr>
<td>103</td>
<td>USER_FAILED_RESUME_VM</td>
<td>Error</td>
<td>Failed to resume VM ${VmName} (Host: ${VdsName}, User: ${UserName}).</td>
</tr>
<tr>
<td>104</td>
<td>USER_FAILED_ADD_VDS</td>
<td>Error</td>
<td>Failed to add Host ${VdsName} (User: ${UserName}).</td>
</tr>
<tr>
<td>105</td>
<td>USER_FAILED_UPDATE_VDS</td>
<td>Error</td>
<td>Failed to update Host ${VdsName} (User: ${UserName}).</td>
</tr>
<tr>
<td>106</td>
<td>USER_FAILED_REMOVE_VDS</td>
<td>Error</td>
<td>Failed to remove Host ${VdsName} (User: ${UserName}).</td>
</tr>
<tr>
<td>107</td>
<td>USER_FAILED_VDS_RESTART</td>
<td>Error</td>
<td>Failed to restart Host ${VdsName}, (User: ${UserName}).</td>
</tr>
<tr>
<td>108</td>
<td>USER_FAILED_ADD_VM_TEMPLATE</td>
<td>Error</td>
<td>Failed to initiate creation of Template ${VmTemplateName} from VM ${VmName} (User: ${UserName}).</td>
</tr>
<tr>
<td>109</td>
<td>USER_FAILED_UPDATE_VM_TEMPLATE</td>
<td>Error</td>
<td>Failed to update Template ${VmTemplateName} (User: ${UserName}).</td>
</tr>
<tr>
<td>110</td>
<td>USER_FAILED_REMOVE_VM_TEMPLATE</td>
<td>Error</td>
<td>Failed to initiate removal of Template ${VmTemplateName} (User: ${UserName}).</td>
</tr>
<tr>
<td>111</td>
<td>USER_STOP_SUSPENDED_VM</td>
<td>Info</td>
<td>Suspended VM ${VmName} has had its save state cleared by ${UserName} (Reason: ${Reason}).</td>
</tr>
<tr>
<td>112</td>
<td>USER_STOP_SUSPENDED_VM_FAILED</td>
<td>Error</td>
<td>Failed to power off suspended VM ${VmName} (User: ${UserName}).</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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</tr>
<tr>
<td>113</td>
<td>USER_REMOVE_VM_FINISHED</td>
<td>Info</td>
<td>VM ${VmName} was successfully removed.</td>
</tr>
<tr>
<td>114</td>
<td>USER_VDC_LOGIN_FAILED</td>
<td>Error</td>
<td>User ${UserName} failed to log in.</td>
</tr>
<tr>
<td>115</td>
<td>USER_FAILED_TRY_BACK_TO_SNAPSHOT</td>
<td>Error</td>
<td>Failed to preview Snapshot ${SnapshotName} for VM ${VmName} (User: ${UserName}).</td>
</tr>
<tr>
<td>116</td>
<td>USER_FAILED_RESTORE_FROM_SNAPSHOT</td>
<td>Error</td>
<td>Failed to restore VM ${VmName} from Snapshot (User: ${UserName}).</td>
</tr>
<tr>
<td>117</td>
<td>USER_FAILED_CREATE_SNAPSHOT</td>
<td>Error</td>
<td>Failed to create Snapshot ${SnapshotName} for VM ${VmName} (User: ${UserName}).</td>
</tr>
<tr>
<td>118</td>
<td>USER_FAILED_VDS_START</td>
<td>Error</td>
<td>Failed to start Host ${VdsName}, (User: ${UserName}).</td>
</tr>
<tr>
<td>119</td>
<td>VM_DOWN_ERROR</td>
<td>Error</td>
<td>VM ${VmName} is down with error. ${ExitMessage}.</td>
</tr>
<tr>
<td>120</td>
<td>VM_MIGRATION_TO_SERVER_FAILED</td>
<td>Error</td>
<td>Migration failed${DueToMigrationError} (VM: ${VmName}, Source: ${VdsName}, Destination: ${DestinationVdsName}).</td>
</tr>
<tr>
<td>121</td>
<td>SYSTEM_VDS_RESTART</td>
<td>Info</td>
<td>Host ${VdsName} was restarted by the engine.</td>
</tr>
<tr>
<td>122</td>
<td>SYSTEM_FAILED_VDS_RESTART</td>
<td>Error</td>
<td>A restart initiated by the engine to Host ${VdsName} has failed.</td>
</tr>
<tr>
<td>123</td>
<td>VDS_SLOW_STORAGE_RESPONSE_TIME</td>
<td>Warning</td>
<td>Slow storage response time on Host ${VdsName}.</td>
</tr>
<tr>
<td>124</td>
<td>VM_IMPORT</td>
<td>Info</td>
<td>Started VM import of ${ImportedVmName} (User: ${UserName})</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
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</tr>
<tr>
<td>125</td>
<td>VM_IMPORT_FAILED</td>
<td>Error</td>
<td>Failed to import VM ${ImportedVmName} (User: ${UserName})</td>
</tr>
<tr>
<td>126</td>
<td>VM_NOT_RESPONDING</td>
<td>Warning</td>
<td>VM ${VmName} is not responding.</td>
</tr>
<tr>
<td>127</td>
<td>VDS_RUN_IN_NO_KVM_MODE</td>
<td>Error</td>
<td>Host ${VdsName} running without virtualization hardware acceleration</td>
</tr>
<tr>
<td>128</td>
<td>VM_MIGRATION.Trying.RERUN</td>
<td>Warning</td>
<td>Failed to migrate VM ${VmName} to Host ${DestinationVdsName}${DueTo MigrationError}. Trying to migrate to another Host.</td>
</tr>
<tr>
<td>129</td>
<td>VM_CLEARED</td>
<td>Info</td>
<td>Unused</td>
</tr>
<tr>
<td>130</td>
<td>USER_SUSPEND_VM_FINISH_FAILURE_WILL_TRY_AGAIN</td>
<td>Error</td>
<td>Failed to complete suspending of VM ${VmName}, will try again.</td>
</tr>
<tr>
<td>131</td>
<td>USER_EXPORT_VM</td>
<td>Info</td>
<td>VM ${VmName} exported to ${ExportPath} by ${UserName}</td>
</tr>
<tr>
<td>132</td>
<td>USER_EXPORT_VM_FAILED</td>
<td>Error</td>
<td>Failed to export VM ${VmName} to ${ExportPath} (User: ${UserName})</td>
</tr>
<tr>
<td>133</td>
<td>USER_EXPORT_TEMPLATE</td>
<td>Info</td>
<td>Template ${VmTemplateName} exported to ${ExportPath} by ${UserName}</td>
</tr>
<tr>
<td>134</td>
<td>USER_EXPORT_TEMPLATE_FAILED</td>
<td>Error</td>
<td>Failed to export Template ${VmTemplateName} to ${ExportPath} (User: ${UserName})</td>
</tr>
<tr>
<td>135</td>
<td>TEMPLATE_IMPORT</td>
<td>Info</td>
<td>Started Template import of ${ImportedVmTemplateName} (User: ${UserName})</td>
</tr>
<tr>
<td>136</td>
<td>TEMPLATE_IMPORT_FAILED</td>
<td>Error</td>
<td>Failed to import Template ${ImportedVmTemplateName} (User: ${UserName})</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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</tr>
<tr>
<td>137</td>
<td>USER_FAILED_VDS_STOP</td>
<td>Error</td>
<td>Failed to stop Host ${VdsName}, (User: ${UserName}).</td>
</tr>
<tr>
<td>138</td>
<td>VM_PAUSED_ENOSPC</td>
<td>Error</td>
<td>VM ${VmName} has been paused due to no Storage space error.</td>
</tr>
<tr>
<td>139</td>
<td>VM_PAUSED_ERROR</td>
<td>Error</td>
<td>VM ${VmName} has been paused due to unknown storage error.</td>
</tr>
<tr>
<td>140</td>
<td>VM_MIGRATION_FAILED_DURING_MOVE_TO_MAINTENANCE</td>
<td>Error</td>
<td>Migration failed${DueToMigrationError} while Host is in 'preparing for maintenance' state.\nConsider manual intervention:\nstopping/migrating Vms as Host's state will not\nturn to maintenance while VMs are still running on it.(VM: ${VmName}, Source: ${VdsName}, Destination: ${DestinationVdsName}).</td>
</tr>
<tr>
<td>141</td>
<td>VDS_VERSION_NOT_SUPPORTED_FOR_CLUSTER</td>
<td>Error</td>
<td>Host ${VdsName} is installed with VDSM version (${VdsSupportedVersions}) and cannot join cluster ${VdsGroupName} which is compatible with VDSM versions ${CompatibilityVersion}.</td>
</tr>
<tr>
<td>142</td>
<td>VM_SET_TO_UNKNOWN_STATUS</td>
<td>Warning</td>
<td>VM ${VmName} was set to the Unknown status.</td>
</tr>
<tr>
<td>143</td>
<td>VM_WAS_SET_DOWN_DUE_TO_HOST_REBOOT_OR_MANUAL_FENCE</td>
<td>Info</td>
<td>Vm ${VmName} was shut down due to ${VdsName} host reboot or manual fence</td>
</tr>
<tr>
<td>144</td>
<td>VM_IMPORT_INFO</td>
<td>Info</td>
<td>Value of field ${FieldName} of imported VM ${VmName} is ${FieldValue}. The field is reset to the default value.</td>
</tr>
<tr>
<td>145</td>
<td>VM_PAUSED_EIO</td>
<td>Error</td>
<td>VM ${VmName} has been paused due to storage I/O problem.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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</tr>
<tr>
<td>146</td>
<td>VM_PAUSED_EPERM</td>
<td>Error</td>
<td>VM ${VmName} has been paused due to storage permissions problem.</td>
</tr>
<tr>
<td>147</td>
<td>VM_POWER_DOWN_FAILED</td>
<td>Warning</td>
<td>Shutdown of VM ${VmName} failed.</td>
</tr>
<tr>
<td>148</td>
<td>VM_MEMORY_UNDER_GUARANTEED_VALUE</td>
<td>Error</td>
<td>VM ${VmName} on host ${VdsName} was guaranteed ${MemGuaranteed} MB but currently has ${MemActual} MB</td>
</tr>
<tr>
<td>149</td>
<td>USER_ADD</td>
<td>Info</td>
<td>User '${NewUserName}' was added successfully to the system.</td>
</tr>
<tr>
<td>150</td>
<td>USER_INITIATED_RUN_VM</td>
<td>Info</td>
<td>Starting VM ${VmName} was initiated by ${UserName}.</td>
</tr>
<tr>
<td>151</td>
<td>USER_INITIATED_RUN_VM_FAILED</td>
<td>Warning</td>
<td>Failed to run VM ${VmName} on Host ${VdsName}.</td>
</tr>
<tr>
<td>152</td>
<td>USER_RUN_VM_ON_NON_DEFAULT_VDS</td>
<td>Warning</td>
<td>Guest ${VmName} started on Host ${VdsName}. (Default Host parameter was ignored - assigned Host was not available).</td>
</tr>
<tr>
<td>153</td>
<td>USER_STARTED_VM</td>
<td>Info</td>
<td>VM ${VmName} was started by ${UserName} (Host: ${VdsName}).</td>
</tr>
<tr>
<td>154</td>
<td>VDS_CLUSTER_VERSION_NOT_SUPPORTED</td>
<td>Error</td>
<td>Host ${VdsName} is compatible with versions (${VdsSupportedVersions}) and cannot join Cluster ${VdsGroupName} which is set to version ${CompatibilityVersion}.</td>
</tr>
<tr>
<td>155</td>
<td>VDS_ARCHITECTURE_NOT_SUPPORTED_FOR_CLUSTER</td>
<td>Error</td>
<td>Host ${VdsName} has architecture ${VdsArchitecture} and cannot join Cluster ${VdsGroupName} which has architecture ${VdsGroupArchitecture}.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
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</tr>
<tr>
<td>156</td>
<td>CPU_TYPE_UNSUPPORTED_IN_THIS_CLUSTER_VERSION</td>
<td>Error</td>
<td>Host ${VdsName} moved to Non-Operational state as host CPU type is not supported in this cluster compatibility version or is not supported at all</td>
</tr>
<tr>
<td>157</td>
<td>USER_REBOOT_VM</td>
<td>Info</td>
<td>User ${UserName} initiated reboot of VM ${VmName}.</td>
</tr>
<tr>
<td>158</td>
<td>USER_FAILED_REBOOT_VM</td>
<td>Error</td>
<td>Failed to reboot VM ${VmName} (User: ${UserName}).</td>
</tr>
<tr>
<td>159</td>
<td>USER_FORCE_SELECTED_SPM</td>
<td>Info</td>
<td>Host ${VdsName} was force selected by ${UserName}</td>
</tr>
<tr>
<td>160</td>
<td>USER_ACCOUNT_DISABLED_OR_LOCKED</td>
<td>Error</td>
<td>User ${UserName} cannot login, as it got disabled or locked. Please contact the system administrator.</td>
</tr>
<tr>
<td>161</td>
<td>VM_CANCEL_MIGRATION</td>
<td>Info</td>
<td>Migration cancelled (VM: ${VmName}, Source: ${VdsName}, User: ${UserName}).</td>
</tr>
<tr>
<td>162</td>
<td>VM_CANCEL_MIGRATION_FAILED</td>
<td>Error</td>
<td>Failed to cancel migration for VM: ${VmName}</td>
</tr>
<tr>
<td>163</td>
<td>VM_STATUS_RESTORED</td>
<td>Info</td>
<td>VM ${VmName} status was restored to ${VmStatus}.</td>
</tr>
<tr>
<td>164</td>
<td>VM_SET_TICKET</td>
<td>Info</td>
<td>User ${UserName} initiated console session for VM ${VmName}</td>
</tr>
<tr>
<td>165</td>
<td>VM_SET_TICKET_FAILED</td>
<td>Error</td>
<td>User ${UserName} failed to initiate a console session for VM ${VmName}</td>
</tr>
<tr>
<td>166</td>
<td>VM_MIGRATION_NO_VDS_TO_MIGRATE_TO</td>
<td>Warning</td>
<td>No available host was found to migrate VM ${VmName} to.</td>
</tr>
<tr>
<td>167</td>
<td>VM_CONSOLE_CONNECTED</td>
<td>Info</td>
<td>User ${UserName} is connected to VM ${VmName}.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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</tr>
<tr>
<td>168</td>
<td>VM_CONSOLE_DISCONNECTED</td>
<td>Info</td>
<td>User ${UserName} got disconnected from VM ${VmName}.</td>
</tr>
<tr>
<td>169</td>
<td>VM_FAILED_TO_PRESTART_IN_POOL</td>
<td>Warning</td>
<td>Cannot pre-start VM in pool '${VmPoolName}'. The system will continue trying.</td>
</tr>
<tr>
<td>170</td>
<td>USER_CREATE_LIVE_SNAPSHOT_FINISHED_FAILURE</td>
<td>Warning</td>
<td>Failed to create live snapshot '${SnapshotName}' for VM '${VmName}'. VM restart is recommended. Note that using the created snapshot might cause data inconsistency.</td>
</tr>
<tr>
<td>171</td>
<td>USER_RUN_VM_AS_STATELESS_WITH_DISKS_NOT_ALLOWING_SNAPSHOT</td>
<td>Warning</td>
<td>VM ${VmName} was run as stateless with one or more of disks that do not allow snapshots (User:${UserName}).</td>
</tr>
<tr>
<td>172</td>
<td>USER_REMOVE_VM_FINISHED_WITH_ILLEGAL_DISKS</td>
<td>Warning</td>
<td>VM ${VmName} has been removed, but the following disks could not be removed: ${DisksNames}. These disks will appear in the main disks tab in illegal state, please remove manually when possible.</td>
</tr>
<tr>
<td>173</td>
<td>USER_CREATE_LIVE_SNAPSHOT_NO_MEMORY_FAILURE</td>
<td>Error</td>
<td>Failed to save memory as part of Snapshot ${SnapshotName} for VM ${VmName} (User: ${UserName}).</td>
</tr>
<tr>
<td>174</td>
<td>VM_IMPORT_FROM_CONFIGURATION_EXECUTED_SUCCESSFULLY</td>
<td>Info</td>
<td>VM ${VmName} has been successfully imported from the given configuration.</td>
</tr>
<tr>
<td>175</td>
<td>VM_IMPORT_FROM_CONFIGURATION_ATTACH_DISK_S_FAILED</td>
<td>Warning</td>
<td>VM ${VmName} has been imported from the given configuration but the following disk(s) failed to attach: ${DiskAliases}.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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</tr>
<tr>
<td>176</td>
<td>VM_BALLOON_DRIVER_ERROR</td>
<td>Error</td>
<td>The Balloon driver on VM ${VmName} on host ${VdsName} is requested but unavailable.</td>
</tr>
<tr>
<td>177</td>
<td>VM_BALLOON_DRIVER_UNCONTROLLED</td>
<td>Error</td>
<td>The Balloon device on VM ${VmName} on host ${VdsName} is inflated but the device cannot be controlled (guest agent is down).</td>
</tr>
<tr>
<td>178</td>
<td>VM_MEMORY_NOT_IN_RECOMMENDED_RANGE</td>
<td>Warning</td>
<td>VM ${VmName} was configured with ${VmmemInMb}mb of memory while the recommended value range is ${VmMinMemInMb}mb - ${VmMaxMemInMb}mb</td>
</tr>
<tr>
<td>179</td>
<td>USER_INITIATED_Run_VM_AND_Pause</td>
<td>Info</td>
<td>Starting in paused mode VM ${VmName} was initiated by ${UserName}.</td>
</tr>
<tr>
<td>180</td>
<td>TEMPLATE_IMPORT_FROM_CONFIGURATION_SUCCESS</td>
<td>Info</td>
<td>Template ${VmTemplateName} has been successfully imported from the given configuration.</td>
</tr>
<tr>
<td>181</td>
<td>TEMPLATE_IMPORT_FROM_CONFIGURATION_FAILED</td>
<td>Error</td>
<td>Failed to import Template ${VmTemplateName} from the given configuration.</td>
</tr>
<tr>
<td>182</td>
<td>USER_FAILED_ATTACH_USER_TO_VM</td>
<td>Error</td>
<td>Failed to attach User ${AdUserName} to VM ${VmName} (User: ${UserName}).</td>
</tr>
<tr>
<td>183</td>
<td>USER_ATTACH_TAG_TO_TEMPLATE</td>
<td>Info</td>
<td>Tag ${TagName} was attached to Templates(s) ${TemplatesNames} by ${UserName}.</td>
</tr>
<tr>
<td>184</td>
<td>USER_ATTACH_TAG_TO_TEMPLATE_FAILED</td>
<td>Error</td>
<td>Failed to attach Tag ${TagName} to Templates(s) ${TemplatesNames} (User: ${UserName}).</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
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</tr>
<tr>
<td>185</td>
<td>USER_DETACH_TEMPLATE_FROM_TAG</td>
<td>Info</td>
<td>Tag ${TagName} was detached from Template(s) ${TemplatesNames} by ${UserName}.</td>
</tr>
<tr>
<td>186</td>
<td>USER_DETACH_TEMPLATE_FROM_TAG_FAILED</td>
<td>Error</td>
<td>Failed to detach Tag ${TagName} from TEMPLATE(s) ${TemplatesNames} (User: ${UserName}).</td>
</tr>
<tr>
<td>187</td>
<td>VDS_STORAGE_CONNECTION_FAILED_BUT_LAST_VDS</td>
<td>Error</td>
<td>Failed to connect Host ${VdsName} to Data Center, due to connectivity errors with the Storage. Host ${VdsName} will remain in Up state (but inactive), as it is the last Host in the Data Center, to enable manual intervention by the Administrator.</td>
</tr>
<tr>
<td>188</td>
<td>VDS_STORAGES_CONNECTION_FAILED</td>
<td>Error</td>
<td>Failed to connect Host ${VdsName} to the Storage Domains ${failedStorageDomains}.</td>
</tr>
<tr>
<td>189</td>
<td>VDS_STORAGE_VDS_STATUS_FAILED</td>
<td>Error</td>
<td>Host ${VdsName} reports about one of the Active Storage Domains as Problematic.</td>
</tr>
<tr>
<td>190</td>
<td>UPDATE_OVF_FOR_STORAGE_DOMAIN_FAILED</td>
<td>Warning</td>
<td>Failed to update VMs/Templates OVF data for Storage Domain ${StorageDomainName} in Data Center ${StoragePoolName}.</td>
</tr>
<tr>
<td>191</td>
<td>CREATE_OVF_STORE_FOR_STORAGE_DOMAIN_FAILED</td>
<td>Warning</td>
<td>Failed to create OVF store disk for Storage Domain ${StorageDomainName}. \nThe Disk with the id ${DiskId} might be removed manually for automatic attempt to create new one. \nOVF updates won't be attempted on the created disk.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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</tbody>
</table>
| 192   | CREATE_OVF_STORE_FOR_STORAGE_DOMAIN_INITIATE_FAILED                   | Warning  | Failed to create OVF store disk for Storage Domain ${StorageDomainName}.  
OVF data won't be updated meanwhile for that domain.                         |
| 193   | DELETE_OVF_STORE_FOR_STORAGE_DOMAIN_FAILED                           | Warning  | Failed to delete the OVF store disk for Storage Domain ${StorageDomainName}. 
In order to detach the domain please remove it manually or try to detach the domain again for another attempt. |
| 194   | VM_CANCEL_CONVERSION                                                 | Info     | Conversion cancelled (VM: ${VmName}, Source: ${VdsName}, User: ${UserName}).                                                        |
| 195   | VM_CANCEL_CONVERSION_FAILED                                          | Error    | Failed to cancel conversion for VM: ${VmName}                                                                                         |
| 196   | VM_RECOVERED_FROM_PAUSE_ERROR                                        | Normal   | VM ${VmName} has recovered from paused back to up.                                                                                   |
| 200   | IMPORTEXPORT_GET_VMS_INFO_FAILED                                     | Error    | Failed to retrieve VM/Templates information from export domain ${StorageDomainName}                                               |
| 201   | IRS_DISK_SPACE_LOW_ERROR                                             | Error    | Critical, Low disk space.  
${StorageDomainName} domain has ${DiskSpace} GB of free space.                                                                       |
<p>| 202   | IMPORTEXPORT_GET_EXTERNAL_VMS_INFO_FAILED                            | Error    | Failed to retrieve VMS information from external server ${URL}                                                                       |
| 204   | IRS_HOSTED_ON_VDS                                                    | Info     | Storage Pool Manager runs on Host ${VdsName} (Address: ${ServerIp}).                                                                |
| 205   | PROVIDER_ADDED                                                       | Info     | Provider ${ProviderName} was added. (User: ${UserName})                                                                             |</p>
<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
<th>Severity</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>206</td>
<td>PROVIDER_ADDITION_FAILED</td>
<td>Error</td>
<td>Failed to add provider ${ProviderName}. (User: ${UserName})</td>
</tr>
<tr>
<td>207</td>
<td>PROVIDER_UPDATED</td>
<td>Info</td>
<td>Provider ${ProviderName} was updated. (User: ${UserName})</td>
</tr>
<tr>
<td>208</td>
<td>PROVIDER_UPDATE_FAILED</td>
<td>Error</td>
<td>Failed to update provider ${ProviderName}. (User: ${UserName})</td>
</tr>
<tr>
<td>209</td>
<td>PROVIDER_REMOVED</td>
<td>Info</td>
<td>Provider ${ProviderName} was removed. (User: ${UserName})</td>
</tr>
<tr>
<td>210</td>
<td>PROVIDER_REMOVAL_FAILED</td>
<td>Error</td>
<td>Failed to remove provider ${ProviderName}. (User: ${UserName})</td>
</tr>
<tr>
<td>213</td>
<td>PROVIDER_CERTIFICATE_IMPORTED</td>
<td>Info</td>
<td>Certificate for provider ${ProviderName} was imported. (User: ${UserName})</td>
</tr>
<tr>
<td>214</td>
<td>PROVIDER_CERTIFICATE_IMPORT_FAILED</td>
<td>Error</td>
<td>Failed importing Certificate for provider ${ProviderName}. (User: ${UserName})</td>
</tr>
<tr>
<td>250</td>
<td>USER_UPDATE_VM_CLUSTER_DEFAULT_HOST_CLEARED</td>
<td>Info</td>
<td>${VmName} cluster was updated by ${UserName}, Default host was reset to auto assign.</td>
</tr>
<tr>
<td>251</td>
<td>USER_REMOVE_VM_TEMPLATE_finished</td>
<td>Info</td>
<td>Removal of Template ${VmTemplateName} has been completed.</td>
</tr>
<tr>
<td>252</td>
<td>SYSTEM_FAILED_UPDATE_VM</td>
<td>Error</td>
<td>Failed to Update VM ${VmName} that was initiated by system.</td>
</tr>
<tr>
<td>253</td>
<td>SYSTEM_UPDATE_VM</td>
<td>Info</td>
<td>VM ${VmName} configuration was updated by system.</td>
</tr>
<tr>
<td>254</td>
<td>VM_ALREADY_IN_REQUESTED_STATUS</td>
<td>Info</td>
<td>VM ${VmName} is already ${VmStatus}, ${Action} was skipped. User: ${UserName}.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
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</tr>
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</tr>
<tr>
<td>302</td>
<td>USER_ADD_VM_POOL_WITH_VMS</td>
<td>Info</td>
<td>VM Pool ${VmPoolName} (containing ${VmsCount} VMs) was created by ${UserName}.</td>
</tr>
<tr>
<td>303</td>
<td>USER_ADD_VM_POOL_WITH_VMS_FAILED</td>
<td>Error</td>
<td>Failed to create VM Pool ${VmPoolName} (User: ${UserName}).</td>
</tr>
<tr>
<td>304</td>
<td>USER_REMOVE_VM_POOL</td>
<td>Info</td>
<td>VM Pool ${VmPoolName} was removed by ${UserName}.</td>
</tr>
<tr>
<td>305</td>
<td>USER_REMOVE_VM_POOL_FAILED</td>
<td>Error</td>
<td>Failed to remove VM Pool ${VmPoolName} (User: ${UserName}).</td>
</tr>
<tr>
<td>306</td>
<td>USER_ADD_VM_TO_POOL</td>
<td>Info</td>
<td>VM ${VmName} was added to VM Pool ${VmPoolName} by ${UserName}.</td>
</tr>
<tr>
<td>307</td>
<td>USER_ADD_VM_TO_POOL_FAILED</td>
<td>Error</td>
<td>Failed to add VM ${VmName} to VM Pool ${VmPoolName} (User: ${UserName}).</td>
</tr>
<tr>
<td>308</td>
<td>USER_REMOVE_VM_FROM_POOL</td>
<td>Info</td>
<td>VM ${VmName} was removed from VM Pool ${VmPoolName} by ${UserName}.</td>
</tr>
<tr>
<td>309</td>
<td>USER_REMOVE_VM_FROM_POOL_FAILED</td>
<td>Error</td>
<td>Failed to remove VM ${VmName} from VM Pool ${VmPoolName} (User: ${UserName}).</td>
</tr>
<tr>
<td>310</td>
<td>USER_ATTACH_USER_TO_POOL</td>
<td>Info</td>
<td>User ${AdUserName} was attached to VM Pool ${VmPoolName} by ${UserName}.</td>
</tr>
<tr>
<td>311</td>
<td>USER_ATTACH_USER_TO_POOL_FAILED</td>
<td>Error</td>
<td>Failed to attach User ${AdUserName} to VM Pool ${VmPoolName} (User: ${UserName}).</td>
</tr>
<tr>
<td>312</td>
<td>USER_DETACH_USER_FROM_POOL</td>
<td>Info</td>
<td>User ${AdUserName} was detached from VM Pool ${VmPoolName} by ${UserName}.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
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</tr>
<tr>
<td>313</td>
<td>USER_DETACH_USER_FROM_POOL_FAILED</td>
<td>Error</td>
<td>Failed to detach User ${AdUserName} from VM Pool ${VmPoolName} (User: ${UserName}).</td>
</tr>
<tr>
<td>314</td>
<td>USER_UPDATE_VM_POOL</td>
<td>Info</td>
<td>VM Pool ${VmPoolName} configuration was updated by ${UserName}.</td>
</tr>
<tr>
<td>315</td>
<td>USER_UPDATE_VM_POOL_FAILED</td>
<td>Error</td>
<td>Failed to update VM Pool ${VmPoolName} configuration (User: ${UserName}).</td>
</tr>
<tr>
<td>316</td>
<td>USER_ATTACH_USER_TO_VM_FROM_POOL</td>
<td>Info</td>
<td>Attaching User ${AdUserName} to VM ${VmName} in VM Pool ${VmPoolName} was initiated by ${UserName}.</td>
</tr>
<tr>
<td>317</td>
<td>USER_ATTACH_USER_TO_VM_FROM_POOL_FAILED</td>
<td>Error</td>
<td>Failed to attach User ${AdUserName} to VM from VM Pool ${VmPoolName} (User: ${UserName}).</td>
</tr>
<tr>
<td>318</td>
<td>USER_ATTACH_USER_TO_VM_FROM_POOLPLETED_SUCCESS</td>
<td>Info</td>
<td>User ${AdUserName} successfully attached to VM ${VmName} in VM Pool ${VmPoolName}.</td>
</tr>
<tr>
<td>319</td>
<td>USER_ATTACH_USER_TO_VM_FROM_POOLFAILED</td>
<td>Error</td>
<td>Failed to attach user ${AdUserName} to VM ${VmName} in VM Pool ${VmPoolName}.</td>
</tr>
<tr>
<td>320</td>
<td>USER_ADD_VM_POOL_WITH_VMS_ADD_VDS_FAILED</td>
<td>Error</td>
<td>Pool ${VmPoolName} Created, but some Vms failed to create (User: ${UserName}).</td>
</tr>
<tr>
<td>325</td>
<td>USER_REMOVE_ADUSER</td>
<td>Info</td>
<td>User ${AdUserName} was removed by ${UserName}.</td>
</tr>
<tr>
<td>326</td>
<td>USER_FAILED_REMOVE_ADUSER</td>
<td>Error</td>
<td>Failed to remove User ${AdUserName} (User: ${UserName}).</td>
</tr>
<tr>
<td>327</td>
<td>USER_FAILED_ADD_ADUSER</td>
<td>Warning</td>
<td>Failed to add User '${NewUserName}' to the system.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
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</tr>
<tr>
<td>342</td>
<td>USER_REMOVE_SNAPSHOT</td>
<td>Info</td>
<td>Snapshot '${SnapshotName}' deletion for VM '${VmName}' was initiated by ${UserName}.</td>
</tr>
<tr>
<td>343</td>
<td>USER_FAILED_REMOVE_SNAPSHOT</td>
<td>Error</td>
<td>Failed to remove Snapshot ${SnapshotName} for VM ${VmName} (User: ${UserName}).</td>
</tr>
<tr>
<td>344</td>
<td>USER_UPDATE_VM_POOL_WITH_VMS</td>
<td>Info</td>
<td>VM Pool ${VmPoolName} was updated by ${UserName}, ${VmsCount} VMs were added.</td>
</tr>
<tr>
<td>345</td>
<td>USER_UPDATE_VM_POOL_WITH_VMS_FAILED</td>
<td>Error</td>
<td>Failed to update VM Pool ${VmPoolName}(User: ${UserName}).</td>
</tr>
<tr>
<td>346</td>
<td>USER_PASSWORD_CHANGED</td>
<td>Info</td>
<td>Password changed successfully for ${UserName}</td>
</tr>
<tr>
<td>347</td>
<td>USER_PASSWORD_CHANGED_FAILED</td>
<td>Error</td>
<td>Failed to change password. (User: ${UserName})</td>
</tr>
<tr>
<td>348</td>
<td>USER_CLEAR_UNKNOWN_VMS</td>
<td>Info</td>
<td>All VMs' status on Non Responsive Host ${VdsName} were changed to 'Down' by ${UserName}</td>
</tr>
<tr>
<td>349</td>
<td>USER_FAILED_CLEAR_UNKNOWN_VMS</td>
<td>Error</td>
<td>Failed to clear VMs' status on Non Responsive Host ${VdsName}. (User: ${UserName}).</td>
</tr>
<tr>
<td>350</td>
<td>USER_ADD_BOOKMARK</td>
<td>Info</td>
<td>Bookmark ${BookmarkName} was added by ${UserName}.</td>
</tr>
<tr>
<td>351</td>
<td>USER_ADD_BOOKMARK_FAILED</td>
<td>Error</td>
<td>Failed to add bookmark: ${BookmarkName} (User: ${UserName}).</td>
</tr>
<tr>
<td>352</td>
<td>USER_UPDATE_BOOKMARK</td>
<td>Info</td>
<td>Bookmark ${BookmarkName} was updated by ${UserName}.</td>
</tr>
<tr>
<td>353</td>
<td>USER_UPDATE_BOOKMARK_FAILED</td>
<td>Error</td>
<td>Failed to update bookmark: ${BookmarkName} (User: ${UserName})</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
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</tr>
<tr>
<td>354</td>
<td>USER_REMOVE_BOOKMARK</td>
<td>Info</td>
<td>Bookmark <code>${BookmarkName}</code> was removed by <code>${UserName}</code>.</td>
</tr>
<tr>
<td>355</td>
<td>USER_REMOVE_BOOKMARK_FAILED</td>
<td>Error</td>
<td>Failed to remove bookmark <code>${BookmarkName}</code> (User: <code>${UserName}</code>)</td>
</tr>
<tr>
<td>356</td>
<td>USER_REMOVE_SNAPSHOT_FINISHED_SUCCESS</td>
<td>Info</td>
<td>Snapshot '${SnapshotName}' deletion for VM '${VmName}' has been completed.</td>
</tr>
<tr>
<td>357</td>
<td>USER_REMOVE_SNAPSHOT_FINISHED_FAILURE</td>
<td>Error</td>
<td>Failed to delete snapshot '${SnapshotName}' for VM '${VmName}'.</td>
</tr>
<tr>
<td>358</td>
<td>USER_VM_POOL_MAX_SUBSEQUENT_FAILURES_REACHED</td>
<td>Warning</td>
<td>Not all VMs where successfully created in VM Pool '${VmPoolName}'.</td>
</tr>
<tr>
<td>359</td>
<td>USER_REMOVE_SNAPSHOT_FINISHED_FAILURE_PARTIAL_SNAPSHOT</td>
<td>Warning</td>
<td>Due to partial snapshot removal, Snapshot '${SnapshotName}' of VM '${VmName}' now contains only the following disks: '${DiskAliases}'.</td>
</tr>
<tr>
<td>360</td>
<td>USER_DETACH_USER_FROM_VM</td>
<td>Info</td>
<td>User <code>${AdUserName}</code> was detached from VM <code>${VmName}</code> by <code>${UserName}</code>.</td>
</tr>
<tr>
<td>361</td>
<td>USER_FAILED_DETACH_USER_FROM_VM</td>
<td>Error</td>
<td>Failed to detach User <code>${AdUserName}</code> from VM <code>${VmName}</code> (User: <code>${UserName}</code>).</td>
</tr>
<tr>
<td>370</td>
<td>USER_EXTEND_DISK_SIZE_FAILURE</td>
<td>Error</td>
<td>Failed to extend size of the disk '${DiskAlias}' to <code>${NewSize}</code> GB, User: <code>${UserName}</code>.</td>
</tr>
<tr>
<td>371</td>
<td>USER_EXTEND_DISK_SIZE_SUCCESS</td>
<td>Info</td>
<td>Size of the disk '${DiskAlias}' was successfully updated to <code>${NewSize}</code> GB by <code>${UserName}</code>.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
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</tr>
<tr>
<td>372</td>
<td>USER_EXTEND_DISK_SIZE_UPDATE_VM_FAILURE</td>
<td>Warning</td>
<td>Failed to update VM '${VmName}' with the new volume size. VM restart is recommended.</td>
</tr>
<tr>
<td>373</td>
<td>USER_REMOVE_DISK_SNAPSHOT</td>
<td>Info</td>
<td>Disk '${DiskAlias}' from Snapshot(s) '${Snapshots}' of VM '${VmName}' deletion was initiated by ${UserName}.</td>
</tr>
<tr>
<td>374</td>
<td>USER_FAILED_REMOVE_DISK_SNAPSHOT</td>
<td>Error</td>
<td>Failed to delete Disk '${DiskAlias}' from Snapshot(s) '${Snapshots}' of VM '${VmName}' (User: ${UserName}).</td>
</tr>
<tr>
<td>375</td>
<td>USER_REMOVE_DISK_SNAPSHOT_FINISHED_SUCCESS</td>
<td>Info</td>
<td>Disk '${DiskAlias}' from Snapshot(s) '${Snapshots}' of VM '${VmName}' deletion has been completed (User: ${UserName}).</td>
</tr>
<tr>
<td>376</td>
<td>USER_REMOVE_DISK_SNAPSHOT_FINISHED_FAILURE</td>
<td>Error</td>
<td>Failed to complete deletion of Disk '${DiskAlias}' from snapshot(s) '${Snapshots}' of VM '${VmName}' (User: ${UserName}).</td>
</tr>
<tr>
<td>377</td>
<td>USER_EXTENDED_DISK_SIZE</td>
<td>Info</td>
<td>Extending disk '${DiskAlias}' to ${NewSize} GB was initiated by ${UserName}.</td>
</tr>
<tr>
<td>378</td>
<td>USER_REGISTER_DISK_FINISHED_SUCCESS</td>
<td>Info</td>
<td>Disk '${DiskAlias}' has been successfully registered as a floating disk.</td>
</tr>
<tr>
<td>379</td>
<td>USER_REGISTER_DISK_FINISHED_FAILURE</td>
<td>Error</td>
<td>Failed to register Disk '${DiskAlias}'.</td>
</tr>
<tr>
<td>380</td>
<td>USER_EXTEND_DISK_SIZE_UPDATE_HOST_FAILURE</td>
<td>Warning</td>
<td>Failed to refresh volume size on host '${VdsName}'. Please try the operation again.</td>
</tr>
<tr>
<td>400</td>
<td>USER_ATTACH_VM_TO_AD_GROUP</td>
<td>Info</td>
<td>Group ${GroupName} was attached to VM ${VmName} by ${UserName}.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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</tr>
<tr>
<td>401</td>
<td>USER_ATTACH_VM_TO_AD_GROUP_FAILED</td>
<td>Error</td>
<td>Failed to attach Group ${GroupName} to VM ${VmName} (User: ${UserName}).</td>
</tr>
<tr>
<td>402</td>
<td>USER_DETACH_VM_TO_AD_GROUP</td>
<td>Info</td>
<td>Group ${GroupName} was detached from VM ${VmName} by ${UserName}.</td>
</tr>
<tr>
<td>403</td>
<td>USER_DETACH_VM_TO_AD_GROUP_FAILED</td>
<td>Error</td>
<td>Failed to detach Group ${GroupName} from VM ${VmName} (User: ${UserName}).</td>
</tr>
<tr>
<td>404</td>
<td>USER_ATTACH_VM_POOL_TO_AD_GROUP</td>
<td>Info</td>
<td>Group ${GroupName} was attached to VM Pool ${VmPoolName} by ${UserName}.</td>
</tr>
<tr>
<td>405</td>
<td>USER_ATTACH_VM_POOL_TO_AD_GROUP_FAILED</td>
<td>Error</td>
<td>Failed to attach Group ${GroupName} to VM Pool ${VmPoolName} (User: ${UserName}).</td>
</tr>
<tr>
<td>406</td>
<td>USER_DETACH_VM_POOL_TO_AD_GROUP</td>
<td>Info</td>
<td>Group ${GroupName} was detached from VM Pool ${VmPoolName} by ${UserName}.</td>
</tr>
<tr>
<td>407</td>
<td>USER_DETACH_VM_POOL_TO_AD_GROUP_FAILED</td>
<td>Error</td>
<td>Failed to detach Group ${GroupName} from VM Pool ${VmPoolName} (User: ${UserName}).</td>
</tr>
<tr>
<td>408</td>
<td>USER_REMOVE_AD_GROUP</td>
<td>Info</td>
<td>Group ${GroupName} was removed by ${UserName}.</td>
</tr>
<tr>
<td>409</td>
<td>USER_REMOVE_AD_GROUP_FAILED</td>
<td>Error</td>
<td>Failed to remove group ${GroupName} (User: ${UserName}).</td>
</tr>
<tr>
<td>430</td>
<td>USER_UPDATE_TAG</td>
<td>Info</td>
<td>Tag ${TagName} configuration was updated by ${UserName}.</td>
</tr>
<tr>
<td>431</td>
<td>USER_UPDATE_TAG_FAILED</td>
<td>Error</td>
<td>Failed to update Tag ${TagName} (User: ${UserName}).</td>
</tr>
<tr>
<td>432</td>
<td>USER_ADD_TAG</td>
<td>Info</td>
<td>New Tag ${TagName} was created by ${UserName}.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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</tr>
<tr>
<td>433</td>
<td>USER_ADD_TAG_FAILED</td>
<td>Error</td>
<td>Failed to create Tag named ${TagName} (User: ${UserName}).</td>
</tr>
<tr>
<td>434</td>
<td>USER_REMOVE_TAG</td>
<td>Info</td>
<td>Tag ${TagName} was removed by ${UserName}.</td>
</tr>
<tr>
<td>435</td>
<td>USER_REMOVE_TAG_FAILED</td>
<td>Error</td>
<td>Failed to remove Tag ${TagName} (User: ${UserName}).</td>
</tr>
<tr>
<td>436</td>
<td>USER_ATTACH_TAG_TO_USER</td>
<td>Info</td>
<td>Tag ${TagName} was attached to User(s) ${AttachUsersNames} by ${UserName}.</td>
</tr>
<tr>
<td>437</td>
<td>USER_ATTACH_TAG_TO_USER_FAILED</td>
<td>Error</td>
<td>Failed to attach Tag ${TagName} to User(s) ${AttachUsersNames} (User: ${UserName}).</td>
</tr>
<tr>
<td>438</td>
<td>USER_ATTACH_TAG_TO_USER_GROUP</td>
<td>Info</td>
<td>Tag ${TagName} was attached to Group(s) ${AttachGroupsNames} by ${UserName}.</td>
</tr>
<tr>
<td>439</td>
<td>USER_ATTACH_TAG_TO_USER_GROUP_FAILED</td>
<td>Error</td>
<td>Failed to attach Group(s) ${AttachGroupsNames} to Tag ${TagName} (User: ${UserName}).</td>
</tr>
<tr>
<td>440</td>
<td>USER_ATTACH_TAG_TO_VM</td>
<td>Info</td>
<td>Tag ${TagName} was attached to VM(s) ${VmsNames} by ${UserName}.</td>
</tr>
<tr>
<td>441</td>
<td>USER_ATTACH_TAG_TO_VM_FAILED</td>
<td>Error</td>
<td>Failed to attach Tag ${TagName} to VM(s) ${VmsNames} (User: ${UserName}).</td>
</tr>
<tr>
<td>442</td>
<td>USER_ATTACH_TAG_TO_VDS</td>
<td>Info</td>
<td>Tag ${TagName} was attached to Host(s) ${VdsNames} by ${UserName}.</td>
</tr>
<tr>
<td>443</td>
<td>USER_ATTACH_TAG_TO_VDS_FAILED</td>
<td>Error</td>
<td>Failed to attach Tag ${TagName} to Host(s) ${VdsNames} (User: ${UserName}).</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
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</tr>
<tr>
<td>444</td>
<td>USER_DETACH_VDS_FROM_TAG</td>
<td>Info</td>
<td>Tag <code>{TagName}</code> was detached from Host(s) <code>{VdsNames}</code> by <code>{UserName}</code>.</td>
</tr>
<tr>
<td>445</td>
<td>USER_DETACH_VDS_FROM_TAG_FAILED</td>
<td>Error</td>
<td>Failed to detach Tag <code>{TagName}</code> from Host(s) <code>{VdsNames}</code> (User: <code>{UserName}</code>).</td>
</tr>
<tr>
<td>446</td>
<td>USER_DETACH_VM_FROM_TAG</td>
<td>Info</td>
<td>Tag <code>{TagName}</code> was detached from VM(s) <code>{VmsNames}</code> by <code>{UserName}</code>.</td>
</tr>
<tr>
<td>447</td>
<td>USER_DETACH_VM_FROM_TAG_FAILED</td>
<td>Error</td>
<td>Failed to detach Tag <code>{TagName}</code> from VM(s) <code>{VmsNames}</code> (User: <code>{UserName}</code>).</td>
</tr>
<tr>
<td>448</td>
<td>USER_DETACH_USER_FROM_TAG</td>
<td>Info</td>
<td>Tag <code>{TagName}</code> detached from User(s) <code>{DetachUsersNames}</code> by <code>{UserName}</code>.</td>
</tr>
<tr>
<td>449</td>
<td>USER_DETACH_USER_FROM_TAG_FAILED</td>
<td>Error</td>
<td>Failed to detach Tag <code>{TagName}</code> from User(s) <code>{DetachUsersNames}</code> (User: <code>{UserName}</code>).</td>
</tr>
<tr>
<td>450</td>
<td>USER_DETACH_USER_GROUP_FROM_TAG</td>
<td>Info</td>
<td>Tag <code>{TagName}</code> was detached from Group(s) <code>{DetachGroupsNames}</code> by <code>{UserName}</code>.</td>
</tr>
<tr>
<td>451</td>
<td>USER_DETACH_USER_GROUP_FROM_TAG_FAILED</td>
<td>Error</td>
<td>Failed to detach Tag <code>{TagName}</code> from Group(s) <code>{DetachGroupsNames}</code> (User: <code>{UserName}</code>).</td>
</tr>
<tr>
<td>452</td>
<td>USER_ATTACH_TAG_TO_USER_EXISTS</td>
<td>Warning</td>
<td>Tag <code>{TagName}</code> already attached to User(s) <code>{AttachUsersNamesExists}</code>.</td>
</tr>
<tr>
<td>453</td>
<td>USER_ATTACH_TAG_TO_USER_GROUP_EXISTS</td>
<td>Warning</td>
<td>Tag <code>{TagName}</code> already attached to Group(s) <code>{AttachGroupsNamesExists}</code>.</td>
</tr>
<tr>
<td>454</td>
<td>USER_ATTACH_TAG_TO_VM_EXISTS</td>
<td>Warning</td>
<td>Tag <code>{TagName}</code> already attached to VM(s) <code>{VmsNamesExists}</code>.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>455</td>
<td>USER_ATTACH_TAG_TO_VDS_EXISTS</td>
<td>Warning</td>
<td>Tag ${TagName} already attached to Host(s) ${VdsNamesExists}.</td>
</tr>
<tr>
<td>456</td>
<td>USER_LOGGED_IN_VM</td>
<td>Info</td>
<td>User ${GuestUser} logged into VM ${VmName}.</td>
</tr>
<tr>
<td>457</td>
<td>USER_LOGGED_OUT_VM</td>
<td>Info</td>
<td>User ${GuestUser} logged out from VM ${VmName}.</td>
</tr>
<tr>
<td>458</td>
<td>USER_LOCKED_VM</td>
<td>Info</td>
<td>User ${GuestUser} locked VM ${VmName}.</td>
</tr>
<tr>
<td>459</td>
<td>USER_UNLOCKED_VM</td>
<td>Info</td>
<td>User ${GuestUser} unlocked VM ${VmName}.</td>
</tr>
<tr>
<td>460</td>
<td>USER_ATTACH_TAG_TO_TEMPLATE_EXISTS</td>
<td>Warning</td>
<td>Tag ${TagName} already attached to Template(s) ${TemplatesNamesExists}.</td>
</tr>
<tr>
<td>467</td>
<td>UPDATE_TAGS_VM_DEFAULT_DISPLAY_TYPE</td>
<td>Info</td>
<td>Vm ${VmName} tag default display type was updated</td>
</tr>
<tr>
<td>468</td>
<td>UPDATE_TAGS_VM_DEFAULT_DISPLAY_TYPE_FAILED</td>
<td>Info</td>
<td>Failed to update Vm ${VmName} tag default display type</td>
</tr>
<tr>
<td>470</td>
<td>USER_ATTACH_VM_POOL_TO_AD_GROUP_INTERNAL</td>
<td>Info</td>
<td>Group ${GroupName} was attached to VM Pool ${VmPoolName}.</td>
</tr>
<tr>
<td>471</td>
<td>USER_ATTACH_VM_POOL_TO_AD_GROUP_FAILED_INTERNAL</td>
<td>Error</td>
<td>Failed to attach Group ${GroupName} to VM Pool ${VmPoolName}.</td>
</tr>
<tr>
<td>472</td>
<td>USER_ATTACH_USER_TO_POOL_INTERNAL</td>
<td>Info</td>
<td>User ${AdUserName} was attached to VM Pool ${VmPoolName}.</td>
</tr>
<tr>
<td>473</td>
<td>USER_ATTACH_USER_TO_POOL_FAILED_INTERNAL</td>
<td>Error</td>
<td>Failed to attach User ${AdUserName} to VM Pool ${VmPoolName} (User: ${UserName}).</td>
</tr>
<tr>
<td>493</td>
<td>VDS_ALREADY_IN_REQUESTED_STATUS</td>
<td>Warning</td>
<td>Host ${HostName} is already ${AgentStatus}, Power Management ${Operation} operation skipped.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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</tr>
<tr>
<td>494</td>
<td>VDS_MANUAL_FENCE_STATUS</td>
<td>Info</td>
<td>Manual fence for host ${VdsName} was started.</td>
</tr>
<tr>
<td>495</td>
<td>VDS_MANUAL_FENCE_STATUS_FAILED</td>
<td>Error</td>
<td>Manual fence for host ${VdsName} failed.</td>
</tr>
<tr>
<td>496</td>
<td>VDS_FENCE_STATUS</td>
<td>Info</td>
<td>Host ${VdsName} power management was verified successfully.</td>
</tr>
<tr>
<td>497</td>
<td>VDS_FENCE_STATUS_STATUS_FAILED</td>
<td>Error</td>
<td>Failed to verify Host ${VdsName} power management.</td>
</tr>
<tr>
<td>498</td>
<td>VDS_APPROVE</td>
<td>Info</td>
<td>Host ${VdsName} was successfully approved by user ${UserName}.</td>
</tr>
<tr>
<td>499</td>
<td>VDS_APPROVE_FAILED</td>
<td>Error</td>
<td>Failed to approve Host ${VdsName}.</td>
</tr>
<tr>
<td>500</td>
<td>VDS_FAILED_TO_RUN_VM</td>
<td>Error</td>
<td>Host ${VdsName} will be switched to Error status for ${Time} minutes because it failed to run a VM.</td>
</tr>
<tr>
<td>501</td>
<td>USER_SUSPEND_VM</td>
<td>Info</td>
<td>Suspending VM ${VmName} was initiated by User ${UserName} (Host: ${VdsName}).</td>
</tr>
<tr>
<td>502</td>
<td>USER_FAILED_SUSPEND_VM</td>
<td>Error</td>
<td>Failed to suspend VM ${VmName} (Host: ${VdsName}).</td>
</tr>
<tr>
<td>503</td>
<td>USER_SUSPEND_VM_OK</td>
<td>Info</td>
<td>VM ${VmName} on Host ${VdsName} is suspended.</td>
</tr>
<tr>
<td>504</td>
<td>VDS_INSTALL</td>
<td>Info</td>
<td>Host ${VdsName} installed</td>
</tr>
<tr>
<td>505</td>
<td>VDS_INSTALL_FAILED</td>
<td>Error</td>
<td>Host ${VdsName} installation failed. ${FailedInstallMessage}.</td>
</tr>
<tr>
<td>506</td>
<td>VDS_INITIATED_RUN_VM</td>
<td>Info</td>
<td>VM ${VmName} was restarted on Host ${VdsName}</td>
</tr>
<tr>
<td>509</td>
<td>VDS_INSTALL_IN_PROGRESS</td>
<td>Info</td>
<td>Installing Host ${VdsName}. ${Message}.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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</tr>
<tr>
<td>510</td>
<td>VDS_INSTALL_IN_PROGRESS_WARNING</td>
<td>Warning</td>
<td>Host ${VdsName} installation in progress. ${Message}.</td>
</tr>
<tr>
<td>511</td>
<td>VDS_INSTALL_IN_PROGRESS_ERROR</td>
<td>Error</td>
<td>Failed to install Host ${VdsName}. ${Message}.</td>
</tr>
<tr>
<td>512</td>
<td>USER_SUSPEND_VM_FINISH_SUCCESS</td>
<td>Info</td>
<td>Suspending VM ${VmName} has been completed.</td>
</tr>
<tr>
<td>513</td>
<td>VDS_RECOVER_FAILED_VMS_UNKNOWN</td>
<td>Error</td>
<td>Host ${VdsName} cannot be reached, VMs state on this host are marked as Unknown.</td>
</tr>
<tr>
<td>514</td>
<td>VDS_INITIALIZING</td>
<td>Warning</td>
<td>Host ${VdsName} is initializing. Message: ${ErrorMessage}</td>
</tr>
<tr>
<td>515</td>
<td>VDS_CPU_LOWER_THAN_CLUSTER</td>
<td>Warning</td>
<td>Host ${VdsName} moved to Non-Operational state as host does not meet the cluster's minimum CPU level. Missing CPU features: ${CpuFlags}</td>
</tr>
<tr>
<td>516</td>
<td>VDS_CPU_RETRIEVE_FAILED</td>
<td>Warning</td>
<td>Failed to determine Host ${VdsName} CPU level - could not retrieve CPU flags.</td>
</tr>
<tr>
<td>517</td>
<td>VDS_SET_NONOPERATIONAL</td>
<td>Info</td>
<td>Host ${VdsName} moved to Non-Operational state.</td>
</tr>
<tr>
<td>518</td>
<td>VDS_SET_NONOPERATIONAL_FAILED</td>
<td>Error</td>
<td>Failed to move Host ${VdsName} to Non-Operational state.</td>
</tr>
<tr>
<td>519</td>
<td>VDS_SET_NONOPERATIONAL_NETWORK</td>
<td>Warning</td>
<td>Host ${VdsName} does not comply with the cluster ${VdsGroupName} networks, the following networks are missing on host: '${Networks}'</td>
</tr>
<tr>
<td>520</td>
<td>USER_ATTACH_USER_TO_VM</td>
<td>Info</td>
<td>User ${AdUserName} was attached to VM ${VmName} by ${UserName}.</td>
</tr>
<tr>
<td>521</td>
<td>USER_SUSPEND_VM_FINISH_FAILURE</td>
<td>Error</td>
<td>Failed to complete suspending of VM ${VmName}.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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</tr>
<tr>
<td>522</td>
<td>VDS_SET_NONOPERATIONAL_DOMAIN</td>
<td>Warning</td>
<td>Host ${VdsName} cannot access the Storage Domain(s) ${StorageDomainNames} attached to the Data Center ${StoragePoolName}. Setting Host state to Non-Operational.</td>
</tr>
<tr>
<td>523</td>
<td>VDS_SET_NONOPERATIONAL_DOMAIN_FAILED</td>
<td>Error</td>
<td>Host ${VdsName} cannot access the Storage Domain(s) ${StorageDomainNames} attached to the Data Center ${StoragePoolName}. Failed to set Host state to Non-Operational.</td>
</tr>
<tr>
<td>524</td>
<td>VDS_DOMAIN_DELAY_INTERVAL</td>
<td>Warning</td>
<td>Storage domain ${StorageDomainName} experienced a high latency of ${Delay} seconds from host ${VdsName}. This may cause performance and functional issues. Please consult your Storage Administrator.</td>
</tr>
<tr>
<td>525</td>
<td>VDS_INITIATED_RUN_AS_STATELESS_VM_NOT_YET_RUNNING</td>
<td>Info</td>
<td>Starting VM ${VmName} as stateless was initiated.</td>
</tr>
<tr>
<td>528</td>
<td>USER_EJECT_VM_DISK</td>
<td>Info</td>
<td>CD was ejected from VM ${VmName} by ${UserName}.</td>
</tr>
<tr>
<td>529</td>
<td>USER_EJECT_VM_FLOPPY</td>
<td>Info</td>
<td>Floppy was ejected from VM ${VmName} by ${UserName}.</td>
</tr>
<tr>
<td>530</td>
<td>VDS_MANUAL_FENCE_FAILED_CALL_FENCE_SPM</td>
<td>Warning</td>
<td>Manual fence did not revoke the selected SPM (${VdsName}) since the master storage domain was not active or could not use another host for the fence operation.</td>
</tr>
<tr>
<td>531</td>
<td>VDS_LOW_MEM</td>
<td>Warning</td>
<td>Available memory of host ${HostName} [${AvailableMemory} MB] is under defined threshold [${Threshold} MB].</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
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</tr>
<tr>
<td>532</td>
<td>VDS_HIGH_MEM_USE</td>
<td>Warning</td>
<td>Used memory of host ${HostName} [${UsedMemory}%] exceeded defined threshold [${Threshold}%].</td>
</tr>
<tr>
<td>533</td>
<td>VDS_HIGH_NETWORK_USE</td>
<td>Warning</td>
<td></td>
</tr>
<tr>
<td>534</td>
<td>VDS_HIGH_CPU_USE</td>
<td>Warning</td>
<td>Used CPU of host ${HostName} [${UsedCpu}%] exceeded defined threshold [${Threshold}%].</td>
</tr>
<tr>
<td>535</td>
<td>VDS_HIGH_SWAP_USE</td>
<td>Warning</td>
<td>Used swap memory of host ${HostName} [${UsedSwap}%] exceeded defined threshold [${Threshold}%].</td>
</tr>
<tr>
<td>536</td>
<td>VDS_LOW_SWAP</td>
<td>Warning</td>
<td>Available swap memory of host ${HostName} [${AvailableSwapMemory} MB] is under defined threshold [${Threshold} MB].</td>
</tr>
<tr>
<td>537</td>
<td>VDS_INITIATED_RUN_VM_AS_STATELESS</td>
<td>Info</td>
<td>VM ${VmName} was restarted on Host ${VdsName} as stateless.</td>
</tr>
<tr>
<td>538</td>
<td>USER_RUN_VM_AS_STATELESS</td>
<td>Info</td>
<td>VM ${VmName} started on Host ${VdsName} as stateless.</td>
</tr>
<tr>
<td>539</td>
<td>VDS_AUTO_FENCE_STATUSES</td>
<td>Info</td>
<td>Auto fence for host ${VdsName} was started.</td>
</tr>
<tr>
<td>540</td>
<td>VDS_AUTO_FENCE_STATUSES_FAILED</td>
<td>Error</td>
<td>Auto fence for host ${VdsName} failed.</td>
</tr>
<tr>
<td>541</td>
<td>VDS_AUTO_FENCE_FAILED_CALL_FENCE_SPM</td>
<td>Warning</td>
<td>Auto fence did not revoke the selected SPM (${VdsName}) since the master storage domain wasn't active or could not use another host for the fence operation.</td>
</tr>
<tr>
<td>550</td>
<td>VDS_PACKAGES_IN_PROGRESS</td>
<td>Info</td>
<td>Package update Host ${VdsName}. ${Message}.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
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</tr>
<tr>
<td>551</td>
<td>VDS_PACKAGES_IN_PROGRESS_WARNING</td>
<td>Warning</td>
<td>Host ${VdsName} update packages in progress. ${Message}.</td>
</tr>
<tr>
<td>552</td>
<td>VDS_PACKAGES_IN_PROGRESS_ERROR</td>
<td>Error</td>
<td>Failed to update packages Host ${VdsName}. ${Message}.</td>
</tr>
<tr>
<td>555</td>
<td>USER_MOVE_TAG</td>
<td>Info</td>
<td>Tag ${TagName} was moved from ${OldParentTagName} to ${NewParentTagName} by ${UserName}.</td>
</tr>
<tr>
<td>556</td>
<td>USER_MOVE_TAG_FAILED</td>
<td>Error</td>
<td>Failed to move Tag ${TagName} from ${OldParentTagName} to ${NewParentTagName} (User: ${UserName}).</td>
</tr>
<tr>
<td>600</td>
<td>USER_VDS_MAINTENANCE</td>
<td>Info</td>
<td>Host ${VdsName} was switched to Maintenance mode by ${UserName} (Reason: ${Reason}).</td>
</tr>
<tr>
<td>601</td>
<td>CPU_FLAGS_NX_IS_MISSING</td>
<td>Warning</td>
<td>Host ${VdsName} is missing the NX cpu flag. This flag can be enabled via the host BIOS. Please set Disable Execute (XD) for an Intel host, or No Execute (NX) for AMD. Please make sure to completely power off the host for this change to take effect.</td>
</tr>
<tr>
<td>602</td>
<td>USER_VDS_MAINTENANCE_MIGRATION_FAILED</td>
<td>Warning</td>
<td>Host ${VdsName} cannot change into maintenance mode - not all Vms have been migrated successfully. Consider manual intervention: stopping/migrating Vms: ${failedVms} (User: ${UserName}).</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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</tr>
<tr>
<td>603</td>
<td>VDS_SET_NONOPERATIONAL_IFACE_DOWN</td>
<td>Warning</td>
<td>Host <code>${VdsName}</code> moved to Non-Operational state because interfaces which are down are needed by required networks in the current cluster: '<code>${NicsWithNetworks}'</code>.</td>
</tr>
<tr>
<td>604</td>
<td>VDS_TIME_DRIFT_ALERT</td>
<td>Warning</td>
<td>Host <code>${VdsName}</code> has time-drift of <code>${Actual}</code> seconds while maximum configured value is <code>${Max}</code> seconds.</td>
</tr>
<tr>
<td>605</td>
<td>PROXY_HOST_SELECTION</td>
<td>Info</td>
<td>Host <code>${Proxy}</code> from <code>${Origin}</code> was chosen as a proxy to execute fencing on Host <code>${VdsName}</code>.</td>
</tr>
<tr>
<td>606</td>
<td>HOST_REFRESHED_CAPABILITIES</td>
<td>Info</td>
<td>Successfully refreshed the capabilities of host <code>${VdsName}</code>.</td>
</tr>
<tr>
<td>607</td>
<td>HOST_REFRESHED_CAPABILITIES_FAILED</td>
<td>Error</td>
<td>Failed to refresh the capabilities of host <code>${VdsName}</code>.</td>
</tr>
<tr>
<td>608</td>
<td>HOST_INTERFACE_HIGH_NETWORK_USE</td>
<td>Warning</td>
<td>Host <code>${HostName}</code> has network interface which exceeded the defined threshold <code>${Threshold}%</code> (<code>${InterfaceName}</code>: transmit rate<code>${TransmitRate}%</code>, receive rate <code>${ReceiveRate}%</code>)</td>
</tr>
<tr>
<td>609</td>
<td>HOST_INTERFACE_STATE_UP</td>
<td>Normal</td>
<td>Interface <code>${InterfaceName}</code> on host <code>${VdsName}</code>, changed state to up</td>
</tr>
<tr>
<td>610</td>
<td>HOST_INTERFACE_STATE_DOWN</td>
<td>Warning</td>
<td>Interface <code>${InterfaceName}</code> on host <code>${VdsName}</code>, changed state to down</td>
</tr>
<tr>
<td>611</td>
<td>HOST_BOND_SLAVE_STATE_UP</td>
<td>Normal</td>
<td>Slave <code>${SlaveName}</code> of bond <code>${BondName}</code> on host <code>${VdsName}</code>, changed state to up</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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</tr>
<tr>
<td>612</td>
<td>HOST_BOND_SLAVE_STATE_DOWN</td>
<td>Warning</td>
<td>Slave ${SlaveName} of bond ${BondName} on host ${VdsName}, changed state to down</td>
</tr>
<tr>
<td>613</td>
<td>FENCE_KDUMP_LISTENER_IS_NOT_ALIVE</td>
<td>Error</td>
<td>Unable to determine if Kdump is in progress on host ${VdsName}, because fence_kdump listener is not running.</td>
</tr>
<tr>
<td>614</td>
<td>KDUMP_FLOW_DETECTED_ON_VDS</td>
<td>Info</td>
<td>Kdump flow is in progress on host ${VdsName}.</td>
</tr>
<tr>
<td>615</td>
<td>KDUMP_FLOW_NOT_DETECTED_ON_VDS</td>
<td>Info</td>
<td>Kdump flow is not in progress on host ${VdsName}.</td>
</tr>
<tr>
<td>616</td>
<td>KDUMP_FLOW_FINISHED_ON_VDS</td>
<td>Info</td>
<td>Kdump flow finished on host ${VdsName}.</td>
</tr>
<tr>
<td>617</td>
<td>KDUMP_DETECTION_NOT_CONFIGURED_ON_VDS</td>
<td>Warning</td>
<td>Kdump integration is enabled for host ${VdsName}, but kdump is not configured properly on host.</td>
</tr>
<tr>
<td>618</td>
<td>HOST_REGISTRATION_FAILED_INVALID_CLUSTER</td>
<td>Info</td>
<td>No default or valid cluster was found, Host ${VdsName} registration failed</td>
</tr>
<tr>
<td>700</td>
<td>DISK_ALIGNMENT_SCAN_START</td>
<td>Info</td>
<td>Starting alignment scan of disk '${DiskAlias}'.</td>
</tr>
<tr>
<td>701</td>
<td>DISK_ALIGNMENT_SCAN_FAILURE</td>
<td>Warning</td>
<td>Alignment scan of disk '${DiskAlias}' failed.</td>
</tr>
<tr>
<td>702</td>
<td>DISK_ALIGNMENT_SCAN_SUCCESS</td>
<td>Info</td>
<td>Alignment scan of disk '${DiskAlias}' is complete.</td>
</tr>
<tr>
<td>809</td>
<td>USER_ADD_VDS_GROUP</td>
<td>Info</td>
<td>Cluster ${VdsGroupName} was added by ${UserName}</td>
</tr>
<tr>
<td>810</td>
<td>USER_ADD_VDS_GROUP_FAILED</td>
<td>Error</td>
<td>Failed to add Host cluster (User: ${UserName})</td>
</tr>
<tr>
<td>811</td>
<td>USER_UPDATE_VDS_GROUP</td>
<td>Info</td>
<td>Host cluster ${VdsGroupName} was updated by ${UserName}</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
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<td>--------------------------------------------------------------</td>
</tr>
<tr>
<td>812</td>
<td>USER_UPDATE_VDS_GROUP_FAILED</td>
<td>Error</td>
<td>Failed to update Host cluster (User: ${UserName})</td>
</tr>
<tr>
<td>813</td>
<td>USER_REMOVE_VDS_GROUP</td>
<td>Info</td>
<td>Host cluster ${VdsGroupName} was removed by ${UserName}</td>
</tr>
<tr>
<td>814</td>
<td>USER_REMOVE_VDS_GROUP_FAILED</td>
<td>Error</td>
<td>Failed to remove Host cluster (User: ${UserName})</td>
</tr>
<tr>
<td>815</td>
<td>USER_VDC_LOGOUT_FAILED</td>
<td>Error</td>
<td>Failed to log User ${UserName} out.</td>
</tr>
<tr>
<td>816</td>
<td>MAC_POOL_EMPTY</td>
<td>Warning</td>
<td>No MAC addresses left in the MAC Address Pool.</td>
</tr>
<tr>
<td>818</td>
<td>RUN_VM_FAILED</td>
<td>Error</td>
<td>Cannot run VM ${VmName} on Host ${VdsName}. Error: ${ErrMsg}</td>
</tr>
<tr>
<td>819</td>
<td>VDS_REGISTER_ERROR_UPDATING_HOST</td>
<td>Error</td>
<td>Host registration failed - cannot update Host Name for Host ${VdsName2}. (Host: ${VdsName1})</td>
</tr>
<tr>
<td>820</td>
<td>VDS_REGISTER_ERROR_UPDATING_HOST_ALL_TAKEN</td>
<td>Error</td>
<td>Host registration failed - all available Host Names are taken. (Host: ${VdsName1})</td>
</tr>
<tr>
<td>821</td>
<td>VDS_REGISTER_HOST_IS_ACTIVE</td>
<td>Error</td>
<td>Host registration failed - cannot change Host Name of active Host ${VdsName2}. (Host: ${VdsName1})</td>
</tr>
<tr>
<td>822</td>
<td>VDS_REGISTER_ERROR_UPDATING_NAME</td>
<td>Error</td>
<td>Host registration failed - cannot update Host Name for Host ${VdsName2}. (Host: ${VdsName1})</td>
</tr>
<tr>
<td>823</td>
<td>VDS_REGISTER_ERROR_UPDATING_NAMES_ALL_TAKEN</td>
<td>Error</td>
<td>Host registration failed - all available Host Names are taken. (Host: ${VdsName1})</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>824</td>
<td>VDS_REGISTER_NAME_IS_ACTIVE</td>
<td>Error</td>
<td>Host registration failed - cannot change Host Name of active Host ${VdsName2}. (Host: ${VdsName1})</td>
</tr>
<tr>
<td>825</td>
<td>VDS_REGISTER_AUTO_APPROVE_PATTERN</td>
<td>Error</td>
<td>Host registration failed - auto approve pattern error. (Host: ${VdsName1})</td>
</tr>
<tr>
<td>826</td>
<td>VDS_REGISTER_FAILED</td>
<td>Error</td>
<td>Host registration failed. (Host: ${VdsName1})</td>
</tr>
<tr>
<td>827</td>
<td>VDS_REGISTER_EXISTING_VDS_UPDATE_FAILED</td>
<td>Error</td>
<td>Host registration failed - cannot update existing Host. (Host: ${VdsName1})</td>
</tr>
<tr>
<td>828</td>
<td>VDS_REGISTER_SUCCEEDED</td>
<td>Info</td>
<td>Host ${VdsName1} registered.</td>
</tr>
<tr>
<td>829</td>
<td>VM_MIGRATION_ON_CONNECT_CHECK_FAILED</td>
<td>Error</td>
<td>VM migration logic failed. (VM name: ${VmName})</td>
</tr>
<tr>
<td>830</td>
<td>VM_MIGRATION_ON_CONNECT_CHECK_SUCCEEDED</td>
<td>Info</td>
<td>Migration check failed to execute.</td>
</tr>
<tr>
<td>831</td>
<td>USER_VDC_SESSION_TERMINATED</td>
<td>Info</td>
<td>User ${UserName} forcibly logout user ${TerminatedSessionUsername}.</td>
</tr>
<tr>
<td>832</td>
<td>USER_VDC_SESSION_TERMINATION_FAILED</td>
<td>Error</td>
<td>User ${UserName} failed to forcibly logout user ${TerminatedSessionUsername}.</td>
</tr>
<tr>
<td>833</td>
<td>MAC_ADDRESS_IS_IN_USE</td>
<td>Warning</td>
<td>Network Interface ${IfaceName} has MAC address ${MACAddr} which is in use.</td>
</tr>
<tr>
<td>834</td>
<td>VDS_REGISTER_EMPTY_ID</td>
<td>Warning</td>
<td>Host registration failed, empty host id (Host: ${VdsHostName})</td>
</tr>
<tr>
<td>835</td>
<td>SYSTEM_UPDATE_VDS_GROUP</td>
<td>Info</td>
<td>Host cluster ${VdsGroupName} was updated by system</td>
</tr>
<tr>
<td>836</td>
<td>SYSTEM_UPDATE_VDS_GROUP_FAILED</td>
<td>Info</td>
<td>Failed to update Host cluster by system</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
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<td>---------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>837</td>
<td>MAC_ADDRESSES_POOL_NOT_INITIALIZED</td>
<td>Warning</td>
<td>Mac Address Pool is not initialized. ${Message}</td>
</tr>
<tr>
<td>838</td>
<td>MAC_ADDRESS_IS_IN_USE_UNPLUG</td>
<td>Warning</td>
<td>Network Interface ${IfaceName} has MAC address ${MACAddr} which is in use, therefore it is being unplugged from VM ${VmName}.</td>
</tr>
<tr>
<td>840</td>
<td>HOST_UPGRADE_STARTED</td>
<td>Info</td>
<td>Host ${VdsName} upgrade was started (User: ${UserName}).</td>
</tr>
<tr>
<td>841</td>
<td>HOST_UPGRADE_FAILED</td>
<td>Error</td>
<td>Failed to upgrade Host ${VdsName} (User: ${UserName}).</td>
</tr>
<tr>
<td>842</td>
<td>HOST_UPGRADE_FINISHED</td>
<td>Info</td>
<td>Host ${VdsName} upgrade was completed successfully.</td>
</tr>
<tr>
<td>845</td>
<td>HOST_CERTIFICATION_IS_ABOUT_TO_EXPIRE</td>
<td>Warning</td>
<td>Host ${VdsName} certification is about to expire at ${ExpirationDate}. Please renew the host's certification.</td>
</tr>
<tr>
<td>846</td>
<td>ENGINE_CERTIFICATION_HAS_EXPIRED</td>
<td>Info</td>
<td>Engine's certification has expired at ${ExpirationDate}. Please renew the engine's certification.</td>
</tr>
<tr>
<td>847</td>
<td>ENGINE_CERTIFICATION_IS_ABOUT_TO_EXPIRE</td>
<td>Warning</td>
<td>Engine's certification is about to expire at ${ExpirationDate}. Please renew the engine's certification.</td>
</tr>
<tr>
<td>848</td>
<td>ENGINE_CA_CERTIFICATION_HAS_EXPIRED</td>
<td>Info</td>
<td>Engine's CA certification has expired at ${ExpirationDate}.</td>
</tr>
<tr>
<td>849</td>
<td>ENGINE_CA_CERTIFICATION_IS_ABOUT_TO_EXPIRE</td>
<td>Warning</td>
<td>Engine's CA certification is about to expire at ${ExpirationDate}.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
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</tr>
<tr>
<td>850</td>
<td>USER_ADD_PERMISSION</td>
<td>Info</td>
<td>User/Group ${SubjectName}, Namespace ${Namespace}, Authorization provider: ${Authz} was granted permission for Role ${RoleName} on ${VdcObjectType} ${VdcObjectName}, by ${UserName}.</td>
</tr>
<tr>
<td>851</td>
<td>USER_ADD_PERMISSION_FAILED</td>
<td>Error</td>
<td>User ${UserName} failed to grant permission for Role ${RoleName} on ${VdcObjectType} ${VdcObjectName} to User/Group ${SubjectName}.</td>
</tr>
<tr>
<td>852</td>
<td>USER_REMOVE_PERMISSION</td>
<td>Info</td>
<td>User/Group ${SubjectName} Role ${RoleName} permission was removed from ${VdcObjectType} ${VdcObjectName} by ${UserName}.</td>
</tr>
<tr>
<td>853</td>
<td>USER_REMOVE_PERMISSION_FAILED</td>
<td>Error</td>
<td>User ${UserName} failed to remove permission for Role ${RoleName} from ${VdcObjectType} ${VdcObjectName} to User/Group ${SubjectName}.</td>
</tr>
<tr>
<td>854</td>
<td>USER_ADD_ROLE</td>
<td>Info</td>
<td>Role ${RoleName} granted to ${UserName}</td>
</tr>
<tr>
<td>855</td>
<td>USER_ADD_ROLE_FAILED</td>
<td>Error</td>
<td>Failed to grant role ${RoleName} (User ${UserName})</td>
</tr>
<tr>
<td>856</td>
<td>USER_UPDATE_ROLE</td>
<td>Info</td>
<td>${UserName} Role was updated to the ${RoleName} Role</td>
</tr>
<tr>
<td>857</td>
<td>USER_UPDATE_ROLE_FAILED</td>
<td>Error</td>
<td>Failed to update role ${RoleName} to ${UserName}</td>
</tr>
<tr>
<td>858</td>
<td>USER_REMOVE_ROLE</td>
<td>Info</td>
<td>Role ${RoleName} removed from ${UserName}</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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</tr>
<tr>
<td>859</td>
<td>USER_REMOVE_ROLE_FAILED</td>
<td>Error</td>
<td>Failed to remove role ${RoleName} (User ${UserName})</td>
</tr>
<tr>
<td>860</td>
<td>USER_ATTACHED_ACTION_GROUP_TO_ROLE</td>
<td>Info</td>
<td>Action group ${ActionGroup} was attached to Role ${RoleName} by ${UserName}</td>
</tr>
<tr>
<td>861</td>
<td>USER_ATTACHED_ACTION_GROUP_TO_ROLE_FAILED</td>
<td>Error</td>
<td>Failed to attach Action group ${ActionGroup} to Role ${RoleName} (User: ${UserName})</td>
</tr>
<tr>
<td>862</td>
<td>USER_DETACHED_ACTION_GROUP_FROM_ROLE</td>
<td>Info</td>
<td>Action group ${ActionGroup} was detached from Role ${RoleName} by ${UserName}</td>
</tr>
<tr>
<td>863</td>
<td>USER_DETACHED_ACTION_GROUP_FROM_ROLE_FAILED</td>
<td>Error</td>
<td>Failed to attach Action group ${ActionGroup} to Role ${RoleName} by ${UserName}</td>
</tr>
<tr>
<td>864</td>
<td>USER_ADD_ROLE_WITH_ACTION_GROUP</td>
<td>Info</td>
<td>Role ${RoleName} was added by ${UserName}</td>
</tr>
<tr>
<td>865</td>
<td>USER_ADD_ROLE_WITH_ACTION_GROUP_FAILED</td>
<td>Error</td>
<td>Failed to add role ${RoleName}</td>
</tr>
<tr>
<td>866</td>
<td>USER_ADD_SYSTEM_PERMISSION</td>
<td>Info</td>
<td>User/Group ${SubjectName} was granted permission for Role ${RoleName} on ${VdcObjectType} by ${UserName}.</td>
</tr>
<tr>
<td>867</td>
<td>USER_ADD_SYSTEM_PERMISSION_FAILED</td>
<td>Error</td>
<td>User ${UserName} failed to grant permission for Role ${RoleName} on ${VdcObjectType} to User/Group ${SubjectName}.</td>
</tr>
<tr>
<td>868</td>
<td>USER_REMOVE_SYSTEM_PERMISSION</td>
<td>Info</td>
<td>User/Group ${SubjectName} Role ${RoleName} permission was removed from ${VdcObjectType} by ${UserName}</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>869</td>
<td>USER_REMOVE_SYSTEM_PERMISSION_FAILED</td>
<td>Error</td>
<td>User ${UserName} failed to remove permission for Role ${RoleName} from ${VdcObjectType} to User/Group ${SubjectName}</td>
</tr>
<tr>
<td>870</td>
<td>USER_ADD_PROFILE</td>
<td>Info</td>
<td>Profile created for ${UserName}</td>
</tr>
<tr>
<td>871</td>
<td>USER_ADD_PROFILE_FAILED</td>
<td>Error</td>
<td>Failed to create profile for ${UserName}</td>
</tr>
<tr>
<td>872</td>
<td>USER_UPDATE_PROFILE</td>
<td>Info</td>
<td>Updated profile for ${UserName}</td>
</tr>
<tr>
<td>873</td>
<td>USER_UPDATE_PROFILE_FAILED</td>
<td>Error</td>
<td>Failed to update profile for ${UserName}</td>
</tr>
<tr>
<td>874</td>
<td>USER_REMOVE_PROFILE</td>
<td>Info</td>
<td>Removed profile for ${UserName}</td>
</tr>
<tr>
<td>875</td>
<td>USER_REMOVE_PROFILE_FAILED</td>
<td>Error</td>
<td>Failed to remove profile for ${UserName}</td>
</tr>
<tr>
<td>876</td>
<td>HOST_CERTIFICATION_IS_INVALID</td>
<td>Error</td>
<td>Host ${VdsName} certification is invalid. The certification has no peer certificates.</td>
</tr>
<tr>
<td>877</td>
<td>HOST_CERTIFICATION_HAS_EXPIRED</td>
<td>Info</td>
<td></td>
</tr>
<tr>
<td>878</td>
<td>ENGINE_CERTIFICATION_IS_ABOUT_TO_EXPIRE_ALERT</td>
<td>Info</td>
<td>Engine's certification is about to expire at ${ExpirationDate}. Please renew the engine's certification.</td>
</tr>
<tr>
<td>879</td>
<td>HOST_CERTIFICATION_IS_ABOUT_TO_EXPIRE_ALERT</td>
<td>Info</td>
<td>Host ${VdsName} certification is about to expire at ${ExpirationDate}. Please renew the host's certification.</td>
</tr>
<tr>
<td>880</td>
<td>HOST_CERTIFICATION_ENROLLMENT_STARTED</td>
<td>Normal</td>
<td>Enrolling certificate for host ${VdsName} was started (User: ${UserName}).</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
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<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>881</td>
<td>HOST_CERTIFICATION_ENROLLMENT_FINISHED</td>
<td>Normal</td>
<td>Enrolling certificate for host ${VdsName} was completed successfully (User: ${UserName}).</td>
</tr>
<tr>
<td>882</td>
<td>HOST_CERTIFICATION_ENROLLMENT_FAILED</td>
<td>Error</td>
<td>Failed to enroll certificate for host ${VdsName} (User: ${UserName}).</td>
</tr>
<tr>
<td>883</td>
<td>ENGINE_CA_CERTIFICATION_IS_ABOUT_TO_EXPIRE_ALERT</td>
<td>Info</td>
<td>Engine's CA certification is about to expire at ${ExpirationDate}.</td>
</tr>
<tr>
<td>900</td>
<td>AD_COMPUTER_ACCOUNT_SUCCEEDED</td>
<td>Info</td>
<td>Account creation successful.</td>
</tr>
<tr>
<td>901</td>
<td>AD_COMPUTER_ACCOUNT_FAILED</td>
<td>Error</td>
<td>Account creation failed.</td>
</tr>
<tr>
<td>918</td>
<td>USER_FORCE_REMOVE_STORAGE_POOL</td>
<td>Info</td>
<td>Data Center ${StoragePoolName} was forcibly removed by ${UserName}</td>
</tr>
<tr>
<td>919</td>
<td>USER_FORCE_REMOVE_STORAGE_POOL_FAILED</td>
<td>Error</td>
<td>Failed to forcibly remove Data Center ${StoragePoolName}. (User: ${UserName})</td>
</tr>
<tr>
<td>920</td>
<td>NETWORK_ATTACH_NETWORK_TO_VDS</td>
<td>Info</td>
<td>Attach network: ${NetworkName} to Host: ${VdsName} by ${UserName}.</td>
</tr>
<tr>
<td>921</td>
<td>NETWORK_ATTACH_NETWORK_TO_VDS_FAILED</td>
<td>Error</td>
<td>Failed to attach network: ${NetworkName} to Host: ${VdsName} (User: ${UserName}).</td>
</tr>
<tr>
<td>922</td>
<td>NETWORK_DETACH_NETWORK_FROM_VDS</td>
<td>Info</td>
<td>Detach network: ${NetworkName} from Host: ${VdsName} by ${UserName}.</td>
</tr>
<tr>
<td>923</td>
<td>NETWORK_DETACH_NETWORK_FROM_VDS_FAILED</td>
<td>Error</td>
<td>Failed to detach network: ${NetworkName} from Host: ${VdsName} (User: ${UserName}).</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>924</td>
<td>NETWORK_ADD_BOND</td>
<td>Info</td>
<td>Add bond: ${BondName} with interfaces: ${Interfaces} for Host: ${VdsName} by ${UserName}.</td>
</tr>
<tr>
<td>925</td>
<td>NETWORK_ADD_BOND_FAILED</td>
<td>Error</td>
<td>Failed to add bond: ${BondName} with interfaces: ${Interfaces} for Host: ${VdsName} (User: ${UserName}).</td>
</tr>
<tr>
<td>926</td>
<td>NETWORK_REMOVE_BOND</td>
<td>Info</td>
<td>Remove bond: ${BondName} for Host: ${VdsName} (User: ${UserName}).</td>
</tr>
<tr>
<td>927</td>
<td>NETWORK_REMOVE_BOND_FAILED</td>
<td>Error</td>
<td>Failed to remove bond: ${BondName} for Host: ${VdsName} (User: ${UserName}).</td>
</tr>
<tr>
<td>928</td>
<td>NETWORK_VDS_NETWORK_MATCH_CLUSTER</td>
<td>Info</td>
<td>Vds ${VdsName} network match to cluster ${VdsGroupName}</td>
</tr>
<tr>
<td>929</td>
<td>NETWORK_VDS_NETWORK_NOT_MATCH_CLUSTER</td>
<td>Error</td>
<td>Vds ${VdsName} network does not match to cluster ${VdsGroupName}</td>
</tr>
<tr>
<td>930</td>
<td>NETWORK_REMOVE_VM_INTERFACE</td>
<td>Info</td>
<td>Interface ${InterfaceName} (${InterfaceType}) was removed from VM ${VmName}. (User: ${UserName})</td>
</tr>
<tr>
<td>931</td>
<td>NETWORK_REMOVE_VM_INTERFACE_FAILED</td>
<td>Error</td>
<td>Failed to remove Interface ${InterfaceName} (${InterfaceType}) from VM ${VmName}. (User: ${UserName})</td>
</tr>
<tr>
<td>932</td>
<td>NETWORK_ADD_VM_INTERFACE</td>
<td>Info</td>
<td>Interface ${InterfaceName} (${InterfaceType}) was added to VM ${VmName}. (User: ${UserName})</td>
</tr>
<tr>
<td>933</td>
<td>NETWORK_ADD_VM_INTERFACE_FAILED</td>
<td>Error</td>
<td>Failed to add Interface ${InterfaceName} (${InterfaceType}) to VM ${VmName}. (User: ${UserName})</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>934</td>
<td>NETWORK_UPDATE_VM_INTERFACE</td>
<td>Info</td>
<td>Interface ${InterfaceName} (${InterfaceType}) was updated for VM ${VmName}. ${LinkState} (User: ${UserName})</td>
</tr>
<tr>
<td>935</td>
<td>NETWORK_UPDATE_VM_INTERFACE_FAILED</td>
<td>Error</td>
<td>Failed to update Interface ${InterfaceName} (${InterfaceType}) for VM ${VmName}. (User: ${UserName})</td>
</tr>
<tr>
<td>936</td>
<td>NETWORK_ADD_TEMPLATE_INTERFACE</td>
<td>Info</td>
<td>Interface ${InterfaceName} (${InterfaceType}) was added to Template ${VmTemplateName}. (User: ${UserName})</td>
</tr>
<tr>
<td>937</td>
<td>NETWORK_ADD_TEMPLATE_INTERFACE_FAILED</td>
<td>Error</td>
<td>Failed to add Interface ${InterfaceName} (${InterfaceType}) to Template ${VmTemplateName}. (User: ${UserName})</td>
</tr>
<tr>
<td>938</td>
<td>NETWORK_REMOVE_TEMPLATE_INTERFACE</td>
<td>Info</td>
<td>Interface ${InterfaceName} (${InterfaceType}) was removed from Template ${VmTemplateName}. (User: ${UserName})</td>
</tr>
<tr>
<td>939</td>
<td>NETWORK_REMOVE_TEMPLATE_INTERFACE_FAILED</td>
<td>Error</td>
<td>Failed to remove Interface ${InterfaceName} (${InterfaceType}) from Template ${VmTemplateName}. (User: ${UserName})</td>
</tr>
<tr>
<td>940</td>
<td>NETWORK_UPDATE_TEMPLATE_INTERFACE</td>
<td>Info</td>
<td>Interface ${InterfaceName} (${InterfaceType}) was updated for Template ${VmTemplateName}. (User: ${UserName})</td>
</tr>
<tr>
<td>941</td>
<td>NETWORK_UPDATE_TEMPLATE_INTERFACE_FAILED</td>
<td>Error</td>
<td>Failed to update Interface ${InterfaceName} (${InterfaceType}) for Template ${VmTemplateName}. (User: ${UserName})</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
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<td>----------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>942</td>
<td>NETWORK_ADD_NETWORK</td>
<td>Info</td>
<td>Network <code>${NetworkName}</code> was added to Data Center: <code>${StoragePoolName}</code></td>
</tr>
<tr>
<td>943</td>
<td>NETWORK_ADD_NETWORK_FAILED</td>
<td>Error</td>
<td>Failed to add Network <code>${NetworkName}</code> to Data Center: <code>${StoragePoolName}</code></td>
</tr>
<tr>
<td>944</td>
<td>NETWORK_REMOVE_NETWORK</td>
<td>Info</td>
<td>Network <code>${NetworkName}</code> was removed from Data Center: <code>${StoragePoolName}</code></td>
</tr>
<tr>
<td>945</td>
<td>NETWORK_REMOVE_NETWORK_FAILED</td>
<td>Error</td>
<td>Failed to remove Network <code>${NetworkName}</code> from Data Center: <code>${StoragePoolName}</code></td>
</tr>
<tr>
<td>946</td>
<td>NETWORK_ATTACH_NETWORK_TO_VDS_GROUP</td>
<td>Info</td>
<td>Network <code>${NetworkName}</code> attached to Cluster <code>${VdsGroupName}</code></td>
</tr>
<tr>
<td>947</td>
<td>NETWORK_ATTACH_NETWORK_TO_VDS_GROUP_FAILED</td>
<td>Error</td>
<td>Failed to attach Network <code>${NetworkName}</code> to Cluster <code>${VdsGroupName}</code></td>
</tr>
<tr>
<td>948</td>
<td>NETWORK_DETACH_NETWORK_TO_VDS_GROUP</td>
<td>Info</td>
<td>Network <code>${NetworkName}</code> detached from Cluster <code>${VdsGroupName}</code></td>
</tr>
<tr>
<td>949</td>
<td>NETWORK_DETACH_NETWORK_TO_VDS_GROUP_FAILED</td>
<td>Error</td>
<td>Failed to detach Network <code>${NetworkName}</code> from Cluster <code>${VdsGroupName}</code></td>
</tr>
<tr>
<td>950</td>
<td>USER_ADD_STORAGE_POOL</td>
<td>Info</td>
<td>Data Center <code>${StoragePoolName}</code>, Compatibility Version<code>${CompatibilityVersion}</code> and Quota Type <code>${QuotaEnforcementType}</code> was added by <code>${UserName}</code></td>
</tr>
<tr>
<td>951</td>
<td>USER_ADD_STORAGE_POOL_FAILED</td>
<td>Error</td>
<td>Failed to add Data Center <code>${StoragePoolName}</code>. (User: <code>${UserName}</code>)</td>
</tr>
<tr>
<td>952</td>
<td>USER_UPDATE_STORAGE_POOL</td>
<td>Info</td>
<td>Data Center <code>${StoragePoolName}</code> was updated by <code>${UserName}</code></td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
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<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>953</td>
<td>USER_UPDATE_STORAGE_POOL_FAILED</td>
<td>Error</td>
<td>Failed to update Data Center (\text{${StoragePoolName}$}). (User: (\text{${UserName}$}))</td>
</tr>
<tr>
<td>954</td>
<td>USER_REMOVE_STORAGE_POOL</td>
<td>Info</td>
<td>Data Center (\text{${StoragePoolName}$}) was removed by (\text{${UserName}$})</td>
</tr>
<tr>
<td>955</td>
<td>USER_REMOVE_STORAGE_POOL_FAILED</td>
<td>Error</td>
<td>Failed to remove Data Center (\text{${StoragePoolName}$}). (User: (\text{${UserName}$}))</td>
</tr>
<tr>
<td>956</td>
<td>USER_ADD_STORAGE_DOMAIN</td>
<td>Info</td>
<td>Storage Domain (\text{${StorageDomainName}$}) was added by (\text{${UserName}$})</td>
</tr>
<tr>
<td>957</td>
<td>USER_ADD_STORAGE_DOMAIN_FAILED</td>
<td>Error</td>
<td>Failed to add Storage Domain (\text{${StorageDomainName}$}). (User: (\text{${UserName}$}))</td>
</tr>
<tr>
<td>958</td>
<td>USER_UPDATE_STORAGE_DOMAIN</td>
<td>Info</td>
<td>Storage Domain (\text{${StorageDomainName}$}) was updated by (\text{${UserName}$})</td>
</tr>
<tr>
<td>959</td>
<td>USER_UPDATE_STORAGE_DOMAIN_FAILED</td>
<td>Error</td>
<td>Failed to update Storage Domain (\text{${StorageDomainName}$}). (User: (\text{${UserName}$}))</td>
</tr>
<tr>
<td>960</td>
<td>USER_REMOVE_STORAGE_DOMAIN</td>
<td>Info</td>
<td>Storage Domain (\text{${StorageDomainName}$}) was removed by (\text{${UserName}$})</td>
</tr>
<tr>
<td>961</td>
<td>USER_REMOVE_STORAGE_DOMAIN_FAILED</td>
<td>Error</td>
<td>Failed to remove Storage Domain (\text{${StorageDomainName}$}). (User: (\text{${UserName}$}))</td>
</tr>
<tr>
<td>962</td>
<td>USER_ATTACH_STORAGE_DOMAIN_TO_POOL</td>
<td>Info</td>
<td>Storage Domain (\text{${StorageDomainName}$}) was attached to Data Center (\text{${StoragePoolName}$}) by (\text{${UserName}$})</td>
</tr>
<tr>
<td>963</td>
<td>USER_ATTACH_STORAGE_DOMAIN_TO_POOL_FAILED</td>
<td>Error</td>
<td>Failed to attach Storage Domain (\text{${StorageDomainName}$}) to Data Center (\text{${StoragePoolName}$}). (User: (\text{${UserName}$}))</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
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</tr>
<tr>
<td>964</td>
<td>USER_DETACH_STORAGE_DOMAIN_FROM_POOL</td>
<td>Info</td>
<td>Storage Domain ${StorageDomainName} was detached from Data Center ${StoragePoolName} by ${UserName}</td>
</tr>
<tr>
<td>965</td>
<td>USER_DETACH_STORAGE_DOMAIN_FROM_POOL_FAILED</td>
<td>Error</td>
<td>Failed to detach Storage Domain ${StorageDomainName} to Data Center ${StoragePoolName}. (User: ${UserName})</td>
</tr>
<tr>
<td>966</td>
<td>USER_ACTIVATED_STORAGE_DOMAIN</td>
<td>Info</td>
<td>Storage Domain ${StorageDomainName} (Data Center ${StoragePoolName}) was activated by ${UserName}</td>
</tr>
<tr>
<td>967</td>
<td>USER_ACTIVATE_STORAGE_DOMAIN_FAILED</td>
<td>Error</td>
<td>Failed to activate Storage Domain ${StorageDomainName} (Data Center ${StoragePoolName}) by ${UserName}</td>
</tr>
<tr>
<td>968</td>
<td>USER_DEACTIVATED_STORAGE_DOMAIN</td>
<td>Info</td>
<td>Storage Domain ${StorageDomainName} (Data Center ${StoragePoolName}) was deactivated and has moved to 'Preparing for maintenance' until it will no longer be accessed by any Host of the Data Center.</td>
</tr>
<tr>
<td>969</td>
<td>USER_DEACTIVATE_STORAGE_DOMAIN_FAILED</td>
<td>Error</td>
<td>Failed to deactivate Storage Domain ${StorageDomainName} (Data Center ${StoragePoolName}).</td>
</tr>
<tr>
<td>970</td>
<td>SYSTEM_DEACTIVATED_STORAGE_DOMAIN</td>
<td>Warning</td>
<td>Storage Domain ${StorageDomainName} (Data Center ${StoragePoolName}) was deactivated by system because it's not visible by any of the hosts.</td>
</tr>
<tr>
<td>971</td>
<td>SYSTEM_DEACTIVATE_STORAGE_DOMAIN_FAILED</td>
<td>Error</td>
<td>Failed to deactivate Storage Domain ${StorageDomainName} (Data Center ${StoragePoolName}).</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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</tr>
<tr>
<td>972</td>
<td>USER_EXTENDED_STORAGE_DOMAIN</td>
<td>Info</td>
<td>Storage ${StorageDomainName} has been extended by ${UserName}. Please wait for refresh.</td>
</tr>
<tr>
<td>973</td>
<td>USER_EXTENDED_STORAGE_DOMAIN_FAILED</td>
<td>Error</td>
<td>Failed to extend Storage Domain ${StorageDomainName}. (User: ${UserName})</td>
</tr>
<tr>
<td>974</td>
<td>USER_REMOVE_VG</td>
<td>Info</td>
<td>Volume group ${VgId} was removed by ${UserName}.</td>
</tr>
<tr>
<td>975</td>
<td>USER_REMOVE_VG_FAILED</td>
<td>Error</td>
<td>Failed to remove Volume group ${VgId}. (User: ${UserName})</td>
</tr>
<tr>
<td>976</td>
<td>USER_ACTIVATE_STORAGE_POOL</td>
<td>Info</td>
<td>Data Center ${StoragePoolName} was activated. (User: ${UserName})</td>
</tr>
<tr>
<td>977</td>
<td>USER_ACTIVATE_STORAGE_POOL_FAILED</td>
<td>Error</td>
<td>Failed to activate Data Center ${StoragePoolName}. (User: ${UserName})</td>
</tr>
<tr>
<td>978</td>
<td>SYSTEM_FAILED_CHANGE_STORAGE_POOL_STATUS</td>
<td>Error</td>
<td>Failed to change Data Center ${StoragePoolName} status.</td>
</tr>
<tr>
<td>979</td>
<td>SYSTEM_CHANGE_STORAGE_POOL_STATUS_NO_HOST_FOR_SPM</td>
<td>Error</td>
<td>Fencing failed on Storage Pool Manager ${VdsName} for Data Center ${StoragePoolName}. Setting status to Non-Operational.</td>
</tr>
<tr>
<td>980</td>
<td>SYSTEM_CHANGE_STORAGE_POOL_STATUS_PROBLEMATIC</td>
<td>Warning</td>
<td>Invalid status on Data Center ${StoragePoolName}. Setting status to Non Responsive.</td>
</tr>
<tr>
<td>981</td>
<td>USER_FORCE_REMOVE_STORAGE_DOMAIN</td>
<td>Info</td>
<td>Storage Domain ${StorageDomainName} was forcibly removed by ${UserName}</td>
</tr>
<tr>
<td>982</td>
<td>USER_FORCE_REMOVE_STORAGE_DOMAIN_FAILED</td>
<td>Error</td>
<td>Failed to forcibly remove Storage Domain ${StorageDomainName}. (User: ${UserName})</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
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</tr>
<tr>
<td>983</td>
<td>RECONSTRUCT_MASTER_FAILED_NO_MASTER</td>
<td>Warning</td>
<td>No valid Data Storage Domains are available in Data Center ${StoragePoolName} (please check your storage infrastructure).</td>
</tr>
<tr>
<td>984</td>
<td>RECONSTRUCT_MASTER_DONE</td>
<td>Info</td>
<td>Reconstruct Master Domain for Data Center ${StoragePoolName} completed.</td>
</tr>
<tr>
<td>985</td>
<td>RECONSTRUCT_MASTER_FAILED</td>
<td>Error</td>
<td>Failed to Reconstruct Master Domain for Data Center ${StoragePoolName}.</td>
</tr>
<tr>
<td>986</td>
<td>SYSTEM_CHANGE_STORAGE_POOL_STATUS_PROBLEMSEARCHING_NEW_SPM</td>
<td>Warning</td>
<td>Data Center is being initialized, please wait for initialization to complete.</td>
</tr>
<tr>
<td>987</td>
<td>SYSTEM_CHANGE_STORAGE_POOL_STATUS_PROBLEMSEARCHING_NEW_SPM</td>
<td>Warning</td>
<td>Invalid status on Data Center ${StoragePoolName}. Setting Data Center status to Non Responsive (On host ${VdsName}, Error: ${Error}).</td>
</tr>
<tr>
<td>988</td>
<td>USER_CONNECT_HOSTS_TO_LUN_FAILED</td>
<td>Error</td>
<td>Failed to connect Host ${VdsName} to device. (User: ${UserName})</td>
</tr>
<tr>
<td>989</td>
<td>SYSTEM_CHANGE_STORAGE_POOL_STATUS_PROBLEMSEARCHING_NEW_NONOPERATIONAL</td>
<td>Info</td>
<td>Try to recover Data Center ${StoragePoolName}. Setting status to Non Responsive.</td>
</tr>
<tr>
<td>990</td>
<td>SYSTEM_MASTER_DOMAIN_NOT_IN_SYNC</td>
<td>Warning</td>
<td>Sync Error on Master Domain between Host ${VdsName} and oVirt Engine. Domain: ${StorageDomainName} is marked as Master in oVirt Engine database but not on the Storage side. Please consult with Support on how to fix this issue.</td>
</tr>
<tr>
<td>991</td>
<td>RECOVERY_STORAGE_POOL</td>
<td>Info</td>
<td>Data Center ${StoragePoolName} was recovered by ${UserName}</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
<td>-------</td>
<td>-----------------------------------------------</td>
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<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>992</td>
<td>RECOVERY_STORAGE_POOL_FAILED</td>
<td>Error</td>
<td>Failed to recover Data Center ${StoragePoolName} (User:${UserName})</td>
</tr>
<tr>
<td>993</td>
<td>SYSTEM_CHANGE_STORAGE_POOL_STATUS_RESET_IRS</td>
<td>Info</td>
<td>Data Center ${StoragePoolName} was reset. Setting status to Non Responsive (Elect new Storage Pool Manager).</td>
</tr>
<tr>
<td>994</td>
<td>CONNECT_STORAGE_SERVERS_FAILED</td>
<td>Warning</td>
<td>Failed to connect Host ${VdsName} to Storage Servers</td>
</tr>
<tr>
<td>995</td>
<td>CONNECT_STORAGE_POOL_FAILED</td>
<td>Warning</td>
<td>Failed to connect Host ${VdsName} to Storage Pool ${StoragePoolName}</td>
</tr>
<tr>
<td>996</td>
<td>STORAGE_DOMAIN_ERROR</td>
<td>Error</td>
<td>The error message for connection ${Connection} returned by VDSM was: ${ErrorMessage}</td>
</tr>
<tr>
<td>997</td>
<td>REFRESH_REPOSITORY_IMAGE_LIST_FAILED</td>
<td>Error</td>
<td>Refresh image list failed for domain(s): ${imageDomains}. Please check domain activity.</td>
</tr>
<tr>
<td>998</td>
<td>REFRESH_REPOSITORY_IMAGE_LIST_SUCCEEDED</td>
<td>Info</td>
<td>Refresh image list succeeded for domain(s): ${imageDomains}</td>
</tr>
<tr>
<td>999</td>
<td>STORAGE_ALERT_VG_METADATA_CRITICALLY_FULL</td>
<td>Error</td>
<td>The system has reached the 80% watermark on the VG metadata area size on ${StorageDomainName}. This is due to a high number of Vdisks or large Vdisks size allocated on this specific VG.</td>
</tr>
<tr>
<td>1000</td>
<td>STORAGE_ALERT_SMALL_VG_METADATA</td>
<td>Warning</td>
<td>The allocated VG metadata area size is smaller than 50MB on ${StorageDomainName}, which might limit its capacity (the number of Vdisks and/or their size).</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
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<td>----------------------------------------------------------------------</td>
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</tr>
<tr>
<td>1001</td>
<td>USER_RUN_VM_FAILURE_STATELESS_SNAPSHOT_LEFT</td>
<td>Error</td>
<td>Failed to start VM ${VmName}, because exist snapshot for stateless state. Snapshot will be deleted.</td>
</tr>
<tr>
<td>1002</td>
<td>USER_ATTACH_STORAGE_DOMAINS_TO_POOL</td>
<td>Info</td>
<td>Storage Domains were attached to Data Center ${StoragePoolName} by ${UserName}</td>
</tr>
<tr>
<td>1003</td>
<td>USER_ATTACH_STORAGE_DOMAINS_TO_POOL_FAILED</td>
<td>Error</td>
<td>Failed to attach Storage Domains to Data Center ${StoragePoolName}. (User: ${UserName})</td>
</tr>
<tr>
<td>1004</td>
<td>STORAGE_DOMAIN_TASKS_ERROR</td>
<td>Warning</td>
<td>Storage Domain ${StorageDomainName} is down while there are tasks running on it. These tasks may fail.</td>
</tr>
<tr>
<td>1005</td>
<td>UPDATE_OVF_FOR_STORAGE_POOL_FAILED</td>
<td>Warning</td>
<td>Failed to update VMs/Templates OVF data in Data Center ${StoragePoolName}.</td>
</tr>
<tr>
<td>1006</td>
<td>UPGRADE_STORAGE_POOL_ENCOUNTERED_PROBLEMS</td>
<td>Warning</td>
<td>Data Center ${StoragePoolName} has encountered problems during upgrade process.</td>
</tr>
<tr>
<td>1007</td>
<td>REFRESH_REPOSITORY_IMAGE_LIST_INCOMPLETE</td>
<td>Warning</td>
<td>Refresh image list probably incomplete for domain ${imageDomain}, only ${imageListSize} images discovered.</td>
</tr>
<tr>
<td>1008</td>
<td>NUMBER_OF_LVS_ON_STORAGE_DOMAIN_EXCEEDED_THRESHOLD</td>
<td>Warning</td>
<td>The number of LVs on the domain ${storageDomainName} exceeded ${maxNumOfLVs}, you are approaching the limit where performance may degrade.</td>
</tr>
<tr>
<td>1010</td>
<td>RELOAD_CONFIGURATION_S_SUCCESS</td>
<td>Info</td>
<td>System Configurations reloaded successfully.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
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</tr>
<tr>
<td>1011</td>
<td>RELOAD_CONFIGURATION_S_FAILURE</td>
<td>Error</td>
<td>System Configurations failed to reload.</td>
</tr>
<tr>
<td>1012</td>
<td>NETWORK_ACTIVATE_VM_INTERFACE_SUCCESS</td>
<td>Info</td>
<td>Network Interface ${InterfaceName} (${InterfaceType}) was plugged to VM ${VmName}. (User: ${UserName})</td>
</tr>
<tr>
<td>1013</td>
<td>NETWORK_ACTIVATE_VM_INTERFACE_FAILURE</td>
<td>Error</td>
<td>Failed to plug Network Interface ${InterfaceName} (${InterfaceType}) to VM ${VmName}. (User: ${UserName})</td>
</tr>
<tr>
<td>1014</td>
<td>NETWORK_DEACTIVATE_VM_INTERFACE_SUCCESS</td>
<td>Info</td>
<td>Network Interface ${InterfaceName} (${InterfaceType}) was unplugged from VM ${VmName}. (User: ${UserName})</td>
</tr>
<tr>
<td>1015</td>
<td>NETWORK_DEACTIVATE_VM_INTERFACE_FAILURE</td>
<td>Error</td>
<td>Failed to unplug Network Interface ${InterfaceName} (${InterfaceType}) from VM ${VmName}. (User: ${UserName})</td>
</tr>
<tr>
<td>1016</td>
<td>UPDATE_FOR_OVF_STORES_FAILED</td>
<td>Warning</td>
<td>Failed to update OVF disks ${DisksIds}, OVF data isn't updated on those OVF stores (Data Center ${DataCenterName}, Storage Domain ${StorageDomainName}).</td>
</tr>
<tr>
<td>1017</td>
<td>RETRIEVE_OVF_STORE_FAILED</td>
<td>Warning</td>
<td>Failed to retrieve VMs and Templates from the OVF disk of Storage Domain ${StorageDomainName}.</td>
</tr>
<tr>
<td>1018</td>
<td>OVF_STORE_DOES_NOT_EXIST</td>
<td>Warning</td>
<td>This Data center compatibility version does not support importing a data domain with its entities (VMs and Templates). The imported domain will be imported without them.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
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</tr>
<tr>
<td>1019</td>
<td>UPDATE_DESCRIPTION_FOR_DISK_FAILED</td>
<td>Error</td>
<td>Failed to update the metadata description of disk <code>${DiskName}</code> (Data Center <code>${DataCenterName}</code>, Storage Domain <code>${StorageDomainName}</code>).</td>
</tr>
<tr>
<td>1020</td>
<td>UPDATE_DESCRIPTION_FOR_DISK_SKIPPED_SINCE_STORAGE_DOMAIN_NOT_ACTIVE</td>
<td>Warning</td>
<td>Not updating the metadata of Disk <code>${DiskName}</code> (Data Center <code>${DataCenterName}</code>). Since the Storage Domain <code>${StorageDomainName}</code> is not in active.</td>
</tr>
<tr>
<td>1021</td>
<td>RETRIEVE_UNREGISTERED_ENTITIES_NOT_SUPPORTED_IN_DC_VERSION</td>
<td>Warning</td>
<td>Skipping retrieval attempt of VMs and Templates from the OVF_STORE disk of Storage Domain <code>${StorageDomainName}</code> since it is not supported by the Data Center version.</td>
</tr>
<tr>
<td>1022</td>
<td>USER_REFRESH_LUN_STORAGE_DOMAIN</td>
<td>Info</td>
<td>Resize LUNs operation succeeded.</td>
</tr>
<tr>
<td>1023</td>
<td>USER_REFRESH_LUN_STORAGE_DOMAIN_FAILED</td>
<td>Error</td>
<td>Failed to resize LUNs.</td>
</tr>
<tr>
<td>1024</td>
<td>USER_REFRESH_LUN_STORAGE_DIFFERENT_SIZE_DOMAIN_FAILED</td>
<td>Error</td>
<td>Failed to resize LUNs.\nNot all the hosts are seeing the same LUN size.</td>
</tr>
<tr>
<td>1025</td>
<td>VM_PAUSED</td>
<td>Info</td>
<td>VM <code>${VmName}</code> has been paused.</td>
</tr>
<tr>
<td>1026</td>
<td>FAILED_TO_STORE_ENTITY_DISK_FIELD_IN_DISK_DESCRIPTION_METADATA</td>
<td>Warning</td>
<td>Failed to store field <code>${DiskFieldName}</code> as a part of <code>${DiskAlias}</code>'s description metadata due to storage space limitations. The field <code>${DiskFieldName}</code> will be truncated.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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</tr>
<tr>
<td>1027</td>
<td>FAILED_TO_STORE_ENTITY_DISK_FIELD_AND_REST_OF_FIELDS_IN_DISK_DESCRIPTION_METADATA</td>
<td>Warning</td>
<td>Failed to store field <code>${DiskFieldName}</code> as a part of <code>${DiskAlias}'s description metadata due to storage space limitations. The value will be truncated and the following fields will not be stored at all: </code>${DiskFieldsNames}`.</td>
</tr>
<tr>
<td>1028</td>
<td>FAILED_TO_STORE_DISK_FIELDS_IN_DISK_DESCRIPTION_METADATA</td>
<td>Warning</td>
<td>Failed to store the following fields in the description metadata of disk <code>${DiskAlias}</code> due to storage space limitations: <code>${DiskFieldsNames}</code>.</td>
</tr>
<tr>
<td>1029</td>
<td>STORAGE_DOMAIN_MOVED_TO_MAINTENANCE</td>
<td>Info</td>
<td>Storage Domain <code>${StorageDomainName} (Data Center ${StoragePoolName})</code> successfully moved to Maintenance as it's no longer accessed by any Host of the Data Center.</td>
</tr>
<tr>
<td>1030</td>
<td>USER_DEACTIVATED_LAST_MASTER_STORAGE_DOMAIN</td>
<td>Info</td>
<td>Storage Domain <code>${StorageDomainName} (Data Center ${StoragePoolName})</code> was deactivated.</td>
</tr>
<tr>
<td>1098</td>
<td>NETWORK_UPDATE_DISPLAY_FOR_HOST_WITH_ACTIVE_VM</td>
<td>Warning</td>
<td>Display Network was updated on Host <code>${VdsName}</code> with active VMs attached. The change will be applied to those VMs after their next reboot. Running VMs might loose display connectivity until then.</td>
</tr>
<tr>
<td>1099</td>
<td>NETWORK_UPDATE_DISPLAY_FOR_CLUSTER_WITH_ACTIVE_VM</td>
<td>Warning</td>
<td>Display Network <code>${NetworkName}</code> was updated for Cluster <code>${VdsGroupName}</code> with active VMs attached. The change will be applied to those VMs after their next reboot.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
<td>-------</td>
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</tr>
<tr>
<td>1100</td>
<td>NETWORK_UPDATE_DISPLAY_TO_VDS_GROUP</td>
<td>Info</td>
<td>Update Display Network (${NetworkName}) for Cluster ${VdsGroupName}. (User: ${UserName})</td>
</tr>
<tr>
<td>1101</td>
<td>NETWORK_UPDATE_DISPLAY_TO_VDS_GROUP_FAILED</td>
<td>Error</td>
<td>Failed to update Display Network (${NetworkName}) for Cluster ${VdsGroupName}. (User: ${UserName})</td>
</tr>
<tr>
<td>1102</td>
<td>NETWORK_UPDATE_NETWORK_TO_VDS_INTERFACE</td>
<td>Info</td>
<td>Update Network ${NetworkName} in Host ${VdsName}. (User: ${UserName})</td>
</tr>
<tr>
<td>1103</td>
<td>NETWORK_UPDATE_NETWORK_TO_VDS_INTERFACE_FAILED</td>
<td>Error</td>
<td>Failed to update Network ${NetworkName} in Host ${VdsName}. (User: ${UserName})</td>
</tr>
<tr>
<td>1104</td>
<td>NETWORK_COMMINT_NETWORK_CHANGES</td>
<td>Info</td>
<td>Network changes were saved on host ${VdsName}</td>
</tr>
<tr>
<td>1105</td>
<td>NETWORK_COMMINT_NETWORK_CHANGES_FAILED</td>
<td>Error</td>
<td>Failed to commit network changes on ${VdsName}</td>
</tr>
<tr>
<td>1106</td>
<td>NETWORK_HOST USING WRONG_CLUSTER_VLAN</td>
<td>Warning</td>
<td>${VdsName} is having wrong vlan id: ${VlanIdHost}, expected vlan id: ${VlanIdCluster}</td>
</tr>
<tr>
<td>1107</td>
<td>NETWORK_HOST MISSING_CLUSTER_VLAN</td>
<td>Warning</td>
<td>${VdsName} is missing vlan id: ${VlanIdCluster} that is expected by the cluster</td>
</tr>
<tr>
<td>1108</td>
<td>VDS_NETWORK_MTU_DIFFER_FROM_LOGICAL_NETWORK</td>
<td>Info</td>
<td></td>
</tr>
<tr>
<td>1109</td>
<td>BRIDGED_NETWORK_OVER_MULTIPLE_INTERFACES</td>
<td>Warning</td>
<td>Bridged network ${NetworkName} is attached to multiple interfaces: ${Interfaces} on Host ${VdsName}.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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</tr>
<tr>
<td>1110</td>
<td>VDS_NETWORKS_OUT_OF_SYNC</td>
<td>Warning</td>
<td>Host ${VdsName}'s following network(s) are not synchronized with their Logical Network configuration: ${Networks}.</td>
</tr>
<tr>
<td>1112</td>
<td>NETWORK_UPDATAE_NETWORK_ON_CLUSTER</td>
<td>Info</td>
<td>Network ${NetworkName} on Cluster ${VdsGroupName} updated.</td>
</tr>
<tr>
<td>1113</td>
<td>NETWORK_UPDATAE_NETWORK_ON_CLUSTER_FAILED</td>
<td>Error</td>
<td>Failed to update Network ${NetworkName} on Cluster ${VdsGroupName}.</td>
</tr>
<tr>
<td>1114</td>
<td>NETWORK_UPDATE_NETWORK</td>
<td>Info</td>
<td>Network ${NetworkName} was updated on Data Center: ${StoragePoolName}</td>
</tr>
<tr>
<td>1115</td>
<td>NETWORK_UPDATE_NETWORK_FAILED</td>
<td>Error</td>
<td>Failed to update Network ${NetworkName} on Data Center: ${StoragePoolName}</td>
</tr>
<tr>
<td>1116</td>
<td>NETWORK_UPDATE_VM_INTERFACE_LINK_UP</td>
<td>Info</td>
<td>Link State is UP.</td>
</tr>
<tr>
<td>1117</td>
<td>NETWORK_UPDATE_VM_INTERFACE_LINK_DOWN</td>
<td>Info</td>
<td>Link State is DOWN.</td>
</tr>
<tr>
<td>1118</td>
<td>INVALID_INTERFACE_FOR_MANAGEMENT_NETWORK_CONFIGURATION</td>
<td>Error</td>
<td>Failed to configure management network on host ${VdsName}. Host ${VdsName} has an invalid interface ${InterfaceName} for the management network configuration.</td>
</tr>
<tr>
<td>1119</td>
<td>VLAN_ID_MISMATCH_FOR_MANAGEMENT_NETWORK_CONFIGURATION</td>
<td>Error</td>
<td>Failed to configure management network on host ${VdsName}. Host ${VdsName} has an interface ${InterfaceName} for the management network configuration with VLAN-ID (${VlanId}), which is different from data-center definition (${MgmtVlanId}).</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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</tr>
<tr>
<td>1120</td>
<td>SETUP_NETWORK_FAILED_FOR_MANAGEMENT_NETWORK_CONFIGURATION</td>
<td>Error</td>
<td>Failed to configure management network on host ${VdsName} due to setup networks failure.</td>
</tr>
<tr>
<td>1121</td>
<td>PERSIST_NETWORK_FAILED_FOR_MANAGEMENT_NETWORK</td>
<td>Warning</td>
<td>Failed to activate host ${VdsName} due to failure in persisting the management network configuration.</td>
</tr>
<tr>
<td>1122</td>
<td>ADD_VNIC_PROFILE</td>
<td>Info</td>
<td>VM network interface profile ${VnicProfileName} was added to network ${NetworkName} in Data Center: ${DataCenterName}. (User: ${UserName})</td>
</tr>
<tr>
<td>1123</td>
<td>ADD_VNIC_PROFILE_FAILED</td>
<td>Error</td>
<td>Failed to add VM network interface profile ${VnicProfileName} to network ${NetworkName} in Data Center: ${DataCenterName} (User: ${UserName})</td>
</tr>
<tr>
<td>1124</td>
<td>UPDATE_VNIC_PROFILE</td>
<td>Info</td>
<td>VM network interface profile ${VnicProfileName} was updated for network ${NetworkName} in Data Center: ${DataCenterName}. (User: ${UserName})</td>
</tr>
<tr>
<td>1125</td>
<td>UPDATE_VNIC_PROFILE_FAILED</td>
<td>Error</td>
<td>Failed to update VM network interface profile ${VnicProfileName} for network ${NetworkName} in Data Center: ${DataCenterName}. (User: ${UserName})</td>
</tr>
<tr>
<td>1126</td>
<td>REMOVE_VNIC_PROFILE</td>
<td>Info</td>
<td>VM network interface profile ${VnicProfileName} was removed from network ${NetworkName} in Data Center: ${DataCenterName}. (User: ${UserName})</td>
</tr>
</tbody>
</table>
### APPENDIX C. EVENT CODES

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
<th>Severity</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>1127</td>
<td>REMOVE_VNIC_PROFILE_FAILED</td>
<td>Error</td>
<td>Failed to remove VM network interface profile ${VnicProfileName} from network ${NetworkName} in Data Center: ${DataCenterName}. (User: ${UserName})</td>
</tr>
<tr>
<td>1128</td>
<td>NETWORK_WITHOUT_INTERFACES</td>
<td>Warning</td>
<td>Network ${NetworkName} is not attached to any interface on host ${VdsName}.</td>
</tr>
<tr>
<td>1129</td>
<td>VNIC_PROFILE_UNSUPPORTED_FEATURES</td>
<td>Warning</td>
<td>VM ${VmName} has network interface ${NicName} which is using profile ${VnicProfile} with unsupported feature(s) '{UnsupportedFeatures}' by VM cluster ${VdsGroupName} (version ${CompatibilityVersion}).</td>
</tr>
<tr>
<td>1131</td>
<td>REMOVE_NETWORK_BY_LABEL_FAILED</td>
<td>Error</td>
<td>Network ${Network} cannot be removed from the following hosts: ${HostNames} in data-center ${StoragePoolName}.</td>
</tr>
<tr>
<td>1132</td>
<td>LABEL_NETWORK</td>
<td>Info</td>
<td>Network ${NetworkName} was labeled ${Label} in data-center ${StoragePoolName}.</td>
</tr>
<tr>
<td>1133</td>
<td>LABEL_NETWORK_FAILED</td>
<td>Error</td>
<td>Failed to label network ${NetworkName} with label ${Label} in data-center ${StoragePoolName}.</td>
</tr>
<tr>
<td>1134</td>
<td>UNLABEL_NETWORK</td>
<td>Info</td>
<td>Network ${NetworkName} was unlabeled in data-center ${StoragePoolName}.</td>
</tr>
<tr>
<td>1135</td>
<td>UNLABEL_NETWORK_FAILED</td>
<td>Error</td>
<td>Failed to unlabel network ${NetworkName} in data-center ${StoragePoolName}.</td>
</tr>
<tr>
<td>1136</td>
<td>LABEL_NIC</td>
<td>Info</td>
<td>Network interface card ${NicName} was labeled ${Label} on host ${VdsName}.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
<td>---------</td>
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</tr>
<tr>
<td>1137</td>
<td>LABEL_NIC_FAILED</td>
<td>Error</td>
<td>Failed to label network interface card <code>${NicName}</code> with label <code>${Label}</code> on host <code>${VdsName}</code>.</td>
</tr>
<tr>
<td>1138</td>
<td>UNLABEL_NIC</td>
<td>Info</td>
<td>Label <code>${Label}</code> was removed from network interface card <code>${NicName}</code> on host <code>${VdsName}</code>.</td>
</tr>
<tr>
<td>1139</td>
<td>UNLABEL_NIC_FAILED</td>
<td>Error</td>
<td>Failed to remove label <code>${Label}</code> from network interface card <code>${NicName}</code> on host <code>${VdsName}</code>.</td>
</tr>
<tr>
<td>1140</td>
<td>SUBNET_REMOVED</td>
<td>Info</td>
<td>Subnet <code>${SubnetName}</code> was removed from provider <code>${ProviderName}</code>. (User: <code>${UserName}</code>)</td>
</tr>
<tr>
<td>1141</td>
<td>SUBNET_REMOVAL_FAILED</td>
<td>Error</td>
<td>Failed to remove subnet <code>${SubnetName}</code> from provider <code>${ProviderName}</code>. (User: <code>${UserName}</code>)</td>
</tr>
<tr>
<td>1142</td>
<td>SUBNET_ADDED</td>
<td>Info</td>
<td>Subnet <code>${SubnetName}</code> was added on provider <code>${ProviderName}</code>. (User: <code>${UserName}</code>)</td>
</tr>
<tr>
<td>1143</td>
<td>SUBNET_ADDITION_FAILED</td>
<td>Error</td>
<td>Failed to add subnet <code>${SubnetName}</code> on provider <code>${ProviderName}</code>. (User: <code>${UserName}</code>)</td>
</tr>
<tr>
<td>1144</td>
<td>CONFIGURE_NETWORK_BY_LABELS_WHEN_CHANGING_CLUSTER_FAILED</td>
<td>Error</td>
<td>Failed to configure networks on host <code>${VdsName}</code> while changing its cluster.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
<td>----------</td>
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<td>----------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1146</td>
<td>PERSIST_NETWORK_ON_HOST_FINISHED</td>
<td>Info</td>
<td>(${Sequence}/${Total}): Successfully applied changes for network(s) ${NetworkNames} on host ${VdsName}. (User: ${UserName})</td>
</tr>
<tr>
<td>1147</td>
<td>PERSIST_NETWORK_ON_HOST_FAILED</td>
<td>Error</td>
<td>(${Sequence}/${Total}): Failed to apply changes for network(s) ${NetworkNames} on host ${VdsName}. (User: ${UserName})</td>
</tr>
<tr>
<td>1148</td>
<td>MULTI_UPDATE_NETWORK_NOT_POSSIBLE</td>
<td>Warning</td>
<td>Cannot apply network ${NetworkName} changes to hosts on unsupported data center ${StoragePoolName}. (User: ${UserName})</td>
</tr>
<tr>
<td>1149</td>
<td>REMOVE_PORT_FROM_EXTERNAL_PROVIDER_FAILED</td>
<td>Warning</td>
<td>Failed to remove vNIC ${NicName} from external network provider ${ProviderName}. The vNIC can be identified on the provider by device id ${NicId}.</td>
</tr>
<tr>
<td>1150</td>
<td>IMPORTEXPORT_EXPORT_VM</td>
<td>Info</td>
<td>Vm ${VmName} was exported successfully to ${StorageDomainName}</td>
</tr>
<tr>
<td>1151</td>
<td>IMPORTEXPORT_EXPORT_VM_FAILED</td>
<td>Error</td>
<td>Failed to export Vm ${VmName} to ${StorageDomainName}</td>
</tr>
<tr>
<td>1152</td>
<td>IMPORTEXPORT_IMPORT_VM</td>
<td>Info</td>
<td>Vm ${VmName} was imported successfully to Data Center ${StoragePoolName}, Cluster ${VdsGroupName}</td>
</tr>
<tr>
<td>1153</td>
<td>IMPORTEXPORT_IMPORT_VM_FAILED</td>
<td>Error</td>
<td>Failed to import Vm ${VmName} to Data Center ${StoragePoolName}, Cluster ${VdsGroupName}</td>
</tr>
<tr>
<td>1154</td>
<td>IMPORTEXPORT_REMOVE_TEMPLATE</td>
<td>Info</td>
<td>Template ${VmTemplateName} was removed from ${StorageDomainName}</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
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<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1155</td>
<td>IMPORTEXPORT_REMOVE_TEMPLATE_FAILED</td>
<td>Error</td>
<td>Failed to remove Template ${VmTemplateName} from ${StorageDomainName}</td>
</tr>
<tr>
<td>1156</td>
<td>IMPORTEXPORT_EXPORT_TEMPLATE</td>
<td>Info</td>
<td>Template ${VmTemplateName} was exported successfully to ${StorageDomainName}</td>
</tr>
<tr>
<td>1157</td>
<td>IMPORTEXPORT_EXPORT_TEMPLATE_FAILED</td>
<td>Error</td>
<td>Failed to export Template ${VmTemplateName} to ${StorageDomainName}</td>
</tr>
<tr>
<td>1158</td>
<td>IMPORTEXPORT_IMPORT_TEMPLATE</td>
<td>Info</td>
<td>Template ${VmTemplateName} was imported successfully to Data Center ${StoragePoolName}, Cluster ${VdsGroupName}</td>
</tr>
<tr>
<td>1159</td>
<td>IMPORTEXPORT_IMPORT_TEMPLATE_FAILED</td>
<td>Error</td>
<td>Failed to import Template ${VmTemplateName} to Data Center ${StoragePoolName}, Cluster ${VdsGroupName}</td>
</tr>
<tr>
<td>1160</td>
<td>IMPORTEXPORT_REMOVE_VM</td>
<td>Info</td>
<td>Vm ${VmName} was removed from ${StorageDomainName}</td>
</tr>
<tr>
<td>1161</td>
<td>IMPORTEXPORT_REMOVE_VM_FAILED</td>
<td>Error</td>
<td>Failed to remove Vm ${VmName} remove from ${StorageDomainName}</td>
</tr>
<tr>
<td>1162</td>
<td>IMPORTEXPORT_STARTING_EXPORT_VM</td>
<td>Info</td>
<td>Starting export Vm ${VmName} to ${StorageDomainName}</td>
</tr>
<tr>
<td>1163</td>
<td>IMPORTEXPORT_STARTING_IMPORT_TEMPLATE</td>
<td>Info</td>
<td>Starting to import Template ${VmTemplateName} to Data Center ${StoragePoolName}, Cluster ${VdsGroupName}</td>
</tr>
<tr>
<td>1164</td>
<td>IMPORTEXPORT_STARTING_EXPORT_TEMPLATE</td>
<td>Info</td>
<td>Starting to export Template ${VmTemplateName} to ${StorageDomainName}</td>
</tr>
<tr>
<td>1165</td>
<td>IMPORTEXPORT_STARTING_IMPORT_VM</td>
<td>Info</td>
<td>Starting to import Vm ${VmName} to Data Center ${StoragePoolName}, Cluster ${VdsGroupName}</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
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</tr>
<tr>
<td>1166</td>
<td>IMPORTEXPORT_STARTING_REMOVE_TEMPLATE</td>
<td>Info</td>
<td>Starting to remove Template ${VmTemplateName} remove ${StorageDomainName}</td>
</tr>
<tr>
<td>1167</td>
<td>IMPORTEXPORT_STARTING_REMOVE_VM</td>
<td>Info</td>
<td>Starting to remove Vm ${VmName} remove from ${StorageDomainName}</td>
</tr>
<tr>
<td>1168</td>
<td>IMPORTEXPORT_FAILED_TO_IMPORT_VM</td>
<td>Warning</td>
<td>Failed to read VM '${ImportedVmName}' OVF, it may be corrupted. Underlying error message: ${ErrorMessage}</td>
</tr>
<tr>
<td>1169</td>
<td>IMPORTEXPORT_FAILED_TO_IMPORT_TEMPLATE</td>
<td>Warning</td>
<td>Failed to read Template '${Template}' OVF, it may be corrupted. Underlying error message: ${ErrorMessage}</td>
</tr>
<tr>
<td>1170</td>
<td>IMPORTEXPORT_IMPORT_TEMPLATE_INVALID_INTERFACE</td>
<td>Normal</td>
<td>While importing Template ${EntityName}, the Network/s ${Networks} were found to be Non-VM Networks or do not exist in Cluster. Network Name was not set in the Interface/s ${Interfaces}.</td>
</tr>
<tr>
<td>1171</td>
<td>USER_ACCOUNT_PASSWORD_EXPIRED</td>
<td>Error</td>
<td>User ${UserName} cannot login, as the user account password has expired. Please contact the system administrator.</td>
</tr>
<tr>
<td>1172</td>
<td>AUTH_FAILED_INVALID CREDENTIALS</td>
<td>Error</td>
<td>User ${UserName} cannot login, please verify the username and password.</td>
</tr>
<tr>
<td>1173</td>
<td>AUTH_FAILED_CLOCK_SKEW_TOO_GREAT</td>
<td>Error</td>
<td>User ${UserName} cannot login, the engine clock is not synchronized with directory services. Please contact the system administrator.</td>
</tr>
<tr>
<td>1174</td>
<td>AUTH_FAILED_NO_KDCS_FOUND</td>
<td>Error</td>
<td>User ${UserName} cannot login, authentication domain cannot be found. Please contact the system administrator.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
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</tr>
<tr>
<td>1175</td>
<td>AUTH_FAILED_DNS_ERROR</td>
<td>Error</td>
<td>User ${UserName} cannot login, there's an error in DNS configuration. Please contact the system administrator.</td>
</tr>
<tr>
<td>1176</td>
<td>AUTH_FAILED_OTHER</td>
<td>Error</td>
<td>User ${UserName} cannot login, unknown kerberos error. Please contact the system administrator.</td>
</tr>
<tr>
<td>1177</td>
<td>AUTH_FAILED_DNS_COMMUNICATION_ERROR</td>
<td>Error</td>
<td>User ${UserName} cannot login, cannot lookup DNS for SRV records. Please contact the system administrator.</td>
</tr>
<tr>
<td>1178</td>
<td>AUTH_FAILED_CONNECTION_TIMED_OUT</td>
<td>Error</td>
<td>User ${UserName} cannot login, connection to LDAP server has timed out. Please contact the system administrator.</td>
</tr>
<tr>
<td>1179</td>
<td>AUTH_FAILED_WRONG_REALM</td>
<td>Error</td>
<td>User ${UserName} cannot login, please verify your domain name.</td>
</tr>
<tr>
<td>1180</td>
<td>AUTH_FAILED_CONNECTION_ERROR</td>
<td>Error</td>
<td>User ${UserName} cannot login, connection refused or some configuration problems exist. Possible DNS error. Please contact the system administrator.</td>
</tr>
<tr>
<td>1181</td>
<td>AUTH_FAILED_CANNOT_FIND_LDAP_SERVER_FOR_DOMAIN</td>
<td>Error</td>
<td>User ${UserName} cannot login, cannot find valid LDAP server for domain. Please contact the system administrator.</td>
</tr>
<tr>
<td>1182</td>
<td>AUTH_FAILED_NO_USER_INFORMATION_WAS_FOUND</td>
<td>Error</td>
<td>User ${UserName} cannot login, no user information was found. Please contact the system administrator.</td>
</tr>
<tr>
<td>1183</td>
<td>AUTH_FAILED_CLIENT_NOT_FOUND_IN_KERBEROS_DATABASE</td>
<td>Error</td>
<td>User ${UserName} cannot login, user was not found in domain. Please contact the system administrator.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
<td>--------</td>
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</tr>
<tr>
<td>1184</td>
<td>AUTH_FAILED_INTERNAL_KERBEROS_ERROR</td>
<td>Error</td>
<td>User ${UserName} cannot login, an internal error has occurred in the Kerberos implementation of the JVM. Please contact the system administrator.</td>
</tr>
<tr>
<td>1185</td>
<td>USER_ACCOUNT_EXPIRED</td>
<td>Error</td>
<td>The account for ${UserName} got expired. Please contact the system administrator.</td>
</tr>
<tr>
<td>1186</td>
<td>IMPORTEXPORT_NO_PROXY_HOSTAVAILABLE_IN_DC</td>
<td>Error</td>
<td>No Host in Data Center '${StoragePoolName}' can serve as a proxy to retrieve remote VMs information (User: ${UserName}).</td>
</tr>
<tr>
<td>1187</td>
<td>IMPORTEXPORT_HOST_CANNOT.Serve.as.PROXY</td>
<td>Error</td>
<td>Host ${VdsName} cannot be used as a proxy to retrieve remote VMs information since it is not up (User: ${UserName}).</td>
</tr>
<tr>
<td>1189</td>
<td>IMPORTEXPORT_IMPORT_VM_FAILED_UPDATING_OVF</td>
<td>Error</td>
<td>Failed to import Vm ${VmName} to Data Center ${StoragePoolName}, Cluster ${VdsGroupName}, could not update VM data in export.</td>
</tr>
<tr>
<td>1190</td>
<td>USER_RESTORE_FROM_SNAPSHOT_START</td>
<td>Info</td>
<td>Restoring VM ${VmName} from snapshot started by user ${UserName}.</td>
</tr>
<tr>
<td>1191</td>
<td>VM_DISK_ALREADY_CHANGED</td>
<td>Info</td>
<td>CD ${DiskName} is already inserted to VM ${VmName}, disk change action was skipped. User: ${UserName}.</td>
</tr>
<tr>
<td>1192</td>
<td>VM_DISK_ALREADY_EJECTED</td>
<td>Info</td>
<td>CD is already ejected from VM ${VmName}, disk change action was skipped. User: ${UserName}.</td>
</tr>
<tr>
<td>1193</td>
<td>IMPORTEXPORT_STARTING_CONVERT_VM</td>
<td>Info</td>
<td>Starting to convert Vm ${VmName}</td>
</tr>
<tr>
<td>1194</td>
<td>IMPORTEXPORT_CONVERT_FAILED</td>
<td>Info</td>
<td>Failed to convert Vm ${VmName}</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
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<td>-----------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1195</td>
<td>IMPORTEXPORT_CANNOT_GET_OVF</td>
<td>Info</td>
<td>Failed to get the configuration of converted Vm ${VmName}</td>
</tr>
<tr>
<td>1196</td>
<td>IMPORTEXPORT_INVALID_OVF</td>
<td>Info</td>
<td>Failed to process the configuration of converted Vm ${VmName}</td>
</tr>
<tr>
<td>1200</td>
<td>ENTITY_RENAMED</td>
<td>Info</td>
<td><code>${EntityType} ${OldEntityName} was renamed from ${OldEntityName} to ${NewEntityName} by ${UserName}.</code></td>
</tr>
<tr>
<td>1201</td>
<td>UPDATE_HOST_NIC_VFS_CONFIG</td>
<td>Info</td>
<td>The VFs configuration of network interface card ${NicName} on host ${VdsName} was updated.</td>
</tr>
<tr>
<td>1202</td>
<td>UPDATE_HOST_NIC_VFS_CONFIG_FAILED</td>
<td>Error</td>
<td>Failed to update the VFs configuration of network interface card ${NicName} on host ${VdsName}.</td>
</tr>
<tr>
<td>1203</td>
<td>ADD_VFS_CONFIG_NETWORK</td>
<td>Info</td>
<td>Network ${NetworkName} was added to the VFs configuration of network interface card ${NicName} on host ${VdsName}.</td>
</tr>
<tr>
<td>1204</td>
<td>ADD_VFS_CONFIG_NETWORK_FAILED</td>
<td>Info</td>
<td>Failed to add ${NetworkName} to the VFs configuration of network interface card ${NicName} on host ${VdsName}.</td>
</tr>
<tr>
<td>1205</td>
<td>REMOVE_VFS_CONFIG_NETWORK</td>
<td>Info</td>
<td>Network ${NetworkName} was removed from the VFs configuration of network interface card ${NicName} on host ${VdsName}.</td>
</tr>
<tr>
<td>1206</td>
<td>REMOVE_VFS_CONFIG_NETWORK_FAILED</td>
<td>Info</td>
<td>Failed to remove ${NetworkName} from the VFs configuration of network interface card ${NicName} on host ${VdsName}.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
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<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1207</td>
<td>ADD_VFS_CONFIG_LABEL</td>
<td>Info</td>
<td>Label ${Label} was added to the VFs configuration of network interface card ${NicName} on host ${VdsName}.</td>
</tr>
<tr>
<td>1208</td>
<td>ADD_VFS_CONFIG_LABEL_FAILED</td>
<td>Info</td>
<td>Failed to add ${Label} to the VFs configuration of network interface card ${NicName} on host ${VdsName}.</td>
</tr>
<tr>
<td>1209</td>
<td>REMOVE_VFS_CONFIG_LABEL</td>
<td>Info</td>
<td>Label ${Label} was removed from the VFs configuration of network interface card ${NicName} on host ${VdsName}.</td>
</tr>
<tr>
<td>1210</td>
<td>REMOVE_VFS_CONFIG_LABEL_FAILED</td>
<td>Info</td>
<td>Failed to remove ${Label} from the VFs configuration of network interface card ${NicName} on host ${VdsName}.</td>
</tr>
<tr>
<td>1300</td>
<td>NUMA_ADD_VM_NUMA_NODE_SUCCESS</td>
<td>Info</td>
<td>Add VM NUMA node successfully.</td>
</tr>
<tr>
<td>1301</td>
<td>NUMA_ADD_VM_NUMA_NODE_FAILED</td>
<td>Error</td>
<td>Add VM NUMA node failed.</td>
</tr>
<tr>
<td>1310</td>
<td>NUMA_UPDATE_VM_NUMA_NODE_SUCCESS</td>
<td>Info</td>
<td>Update VM NUMA node successfully.</td>
</tr>
<tr>
<td>1311</td>
<td>NUMA_UPDATE_VM_NUMA_NODE_FAILED</td>
<td>Error</td>
<td>Update VM NUMA node failed.</td>
</tr>
<tr>
<td>1320</td>
<td>NUMA_REMOVE_VM_NUMA_NODE_SUCCESS</td>
<td>Info</td>
<td>Remove VM NUMA node successfully.</td>
</tr>
<tr>
<td>1321</td>
<td>NUMA_REMOVE_VM_NUMA_NODE_FAILED</td>
<td>Error</td>
<td>Remove VM NUMA node failed.</td>
</tr>
<tr>
<td>1402</td>
<td>USER_LOGIN_ON_BEHALF_FAILED</td>
<td>Error</td>
<td>Failed to execute login on behalf - ${LoginOnBehalfLogInfo}.</td>
</tr>
<tr>
<td>2000</td>
<td>USER_HOTPLUG_DISK</td>
<td>Info</td>
<td>VM ${VmName} disk ${DiskAlias} was plugged by ${UserName}.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
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<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>2001</td>
<td>USER_FAILED_HOTPLUG_DISK</td>
<td>Error</td>
<td>Failed to plug disk ${DiskAlias} to VM ${VmName} (User: ${UserName}).</td>
</tr>
<tr>
<td>2002</td>
<td>USER_HOTUNPLUG_DISK</td>
<td>Info</td>
<td>VM ${VmName} disk ${DiskAlias} was unplugged by ${UserName}.</td>
</tr>
<tr>
<td>2003</td>
<td>USER_FAILED_HOTUNPLUG_DISK</td>
<td>Error</td>
<td>Failed to unplug disk ${DiskAlias} from VM ${VmName} (User: ${UserName}).</td>
</tr>
<tr>
<td>2004</td>
<td>USER_COPIED_TEMPLATE_DISK</td>
<td>Info</td>
<td>User ${UserName} is copying template disk ${DiskAlias} to domain ${StorageDomainName}.</td>
</tr>
<tr>
<td>2005</td>
<td>USER_FAILED_COPY_TEMPLATE_DISK</td>
<td>Error</td>
<td>User ${UserName} failed to copy template disk ${DiskAlias} to domain ${StorageDomainName}.</td>
</tr>
<tr>
<td>2006</td>
<td>USER_COPIED_TEMPLATE_DISK_FINISHED_SUCCESS</td>
<td>Info</td>
<td>User ${UserName} finished copying template disk ${DiskAlias} to domain ${StorageDomainName}.</td>
</tr>
<tr>
<td>2007</td>
<td>USER_COPIED_TEMPLATE_DISK_FINISHED_FAILURE</td>
<td>Error</td>
<td>User ${UserName} finished with error copying template disk ${DiskAlias} to domain ${StorageDomainName}.</td>
</tr>
<tr>
<td>2008</td>
<td>USER_MOVED_VM_DISK</td>
<td>Info</td>
<td>User ${UserName} moving disk ${DiskAlias} to domain ${StorageDomainName}.</td>
</tr>
<tr>
<td>2009</td>
<td>USER_FAILED_MOVED_VM_DISK</td>
<td>Error</td>
<td>User ${UserName} failed to move disk ${DiskAlias} to domain ${StorageDomainName}.</td>
</tr>
<tr>
<td>2010</td>
<td>USER_MOVED_VM_DISK_FINISHED_SUCCESS</td>
<td>Info</td>
<td>User ${UserName} finished moving disk ${DiskAlias} to domain ${StorageDomainName}.</td>
</tr>
<tr>
<td>2011</td>
<td>USER_MOVED_VM_DISK_FINISHED_FAILURE</td>
<td>Error</td>
<td>User ${UserName} have failed to move disk ${DiskAlias} to domain ${StorageDomainName}.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
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<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>2012</td>
<td>USER_FINISHED_REMOVE_DISK_NO_DOMAIN</td>
<td>Info</td>
<td>Disk <code>${DiskAlias}</code> was successfully removed (User <code>${UserName}</code>).</td>
</tr>
<tr>
<td>2013</td>
<td>USER_FINISHED_FAILED_REMOVE_DISK_NO_DOMAIN</td>
<td>Warning</td>
<td>Failed to remove disk <code>${DiskAlias}</code> (User <code>${UserName}</code>).</td>
</tr>
<tr>
<td>2014</td>
<td>USER_FINISHEDREMOVE_DISK</td>
<td>Info</td>
<td>Disk <code>${DiskAlias}</code> was successfully removed from domain <code>${StorageDomainName}</code> (User <code>${UserName}</code>).</td>
</tr>
<tr>
<td>2015</td>
<td>USER_FINISHED_FAILED_REMOVE_DISK</td>
<td>Warning</td>
<td>Failed to remove disk <code>${DiskAlias}</code> from storage domain <code>${StorageDomainName}</code> (User: <code>${UserName}</code>).</td>
</tr>
<tr>
<td>2016</td>
<td>USER_ATTACH_DISK_TO_VM</td>
<td>Info</td>
<td>Disk <code>${DiskAlias}</code> was successfully attached to VM <code>${VmName}</code> by <code>${UserName}</code>.</td>
</tr>
<tr>
<td>2017</td>
<td>USER_FAILED_ATTACH_DISK_TO_VM</td>
<td>Error</td>
<td>Failed to attach Disk <code>${DiskAlias}</code> to VM <code>${VmName}</code> (User: <code>${UserName}</code>).</td>
</tr>
<tr>
<td>2018</td>
<td>USER_DETACH_DISK_FROM_VM</td>
<td>Info</td>
<td>Disk <code>${DiskAlias}</code> was successfully detached from VM <code>${VmName}</code> by <code>${UserName}</code>.</td>
</tr>
<tr>
<td>2019</td>
<td>USER_FAILED_DETACH_DISK_FROM_VM</td>
<td>Error</td>
<td>Failed to detach Disk <code>${DiskAlias}</code> from VM <code>${VmName}</code> (User: <code>${UserName}</code>).</td>
</tr>
<tr>
<td>2020</td>
<td>USER_ADD_DISK</td>
<td>Info</td>
<td>Add-Disk operation of <code>${DiskAlias}' was initiated by </code>${UserName}.</td>
</tr>
<tr>
<td>2021</td>
<td>USER_ADD_DISK_FINISHED_SUCCESS</td>
<td>Info</td>
<td>The disk `${DiskAlias}' was successfully added.</td>
</tr>
<tr>
<td>2022</td>
<td>USER_ADD_DISK_FINISHED_FAILURE</td>
<td>Error</td>
<td>Add-Disk operation failed to complete.</td>
</tr>
<tr>
<td>2023</td>
<td>USER_FAILED_ADD_DISK</td>
<td>Error</td>
<td>Add-Disk operation failed (User: <code>${UserName}</code>).</td>
</tr>
</tbody>
</table>

APPENDIX C. EVENT CODES

<table>
<thead>
<tr>
<th>Code</th>
<th>Name</th>
<th>Severity</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>APPENDIX C</td>
<td>EVENT CODES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
<td>--------</td>
<td>-----------------------------------------------------------</td>
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<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>2024</td>
<td>USER_RUN_UNLOCK_ENTITY_SCRIPT</td>
<td>Info</td>
<td>Possible failure while deleting ${DiskAlias} from the source Storage Domain ${StorageDomainName} during the move operation. The Storage Domain may be manually cleaned-up from possible leftovers (User:${UserName}).</td>
</tr>
<tr>
<td>2025</td>
<td>USER_MOVE_IMAGE_GROUP_FAILED_TO_DELETE_SRC_IMAGE</td>
<td>Warning</td>
<td>Possible failure while deleting ${DiskAlias} from the source Storage Domain ${StorageDomainName} during the move operation. The Storage Domain may be manually cleaned-up from possible leftovers (User:${UserName}).</td>
</tr>
<tr>
<td>2026</td>
<td>USER_MOVE_IMAGE_GROUP_FAILED_TO_DELETE_DST_IMAGE</td>
<td>Warning</td>
<td>Possible failure while clearing possible leftovers of ${DiskAlias} from the target Storage Domain ${StorageDomainName} after the move operation failed to copy the image to it properly. The Storage Domain may be manually cleaned-up from possible leftovers (User:${UserName}).</td>
</tr>
<tr>
<td>2027</td>
<td>USER_IMPORT_IMAGE</td>
<td>Info</td>
<td>User ${UserName} importing image ${RepoImageName} to domain ${StorageDomainName}.</td>
</tr>
<tr>
<td>2028</td>
<td>USER_IMPORT_IMAGE_FINISHED_SUCCESS</td>
<td>Info</td>
<td>User ${UserName} successfully imported image ${RepoImageName} to domain ${StorageDomainName}.</td>
</tr>
<tr>
<td>2029</td>
<td>USER_IMPORT_IMAGE_FINISHED_FAILURE</td>
<td>Error</td>
<td>User ${UserName} failed to import image ${RepoImageName} to domain ${StorageDomainName}.</td>
</tr>
<tr>
<td>2030</td>
<td>USER_EXPORT_IMAGE</td>
<td>Info</td>
<td>User ${UserName} exporting image ${RepoImageName} to domain ${DestinationStorageDomainName}.</td>
</tr>
<tr>
<td>2031</td>
<td>USER_EXPORT_IMAGE_FINISHED_SUCCESS</td>
<td>Info</td>
<td>User ${UserName} successfully exported image ${RepoImageName} to domain ${DestinationStorageDomainName}.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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</tr>
<tr>
<td>2032</td>
<td>USER_EXPORT_IMAGE_FINISHED_FAILURE</td>
<td>Error</td>
<td>User ${UserName} failed to export image ${RepoImageName} to domain ${DestinationStorageDomainName}.</td>
</tr>
<tr>
<td>2033</td>
<td>HOT_SET_NUMBER_OF_CPUS</td>
<td>Info</td>
<td>Hotplug CPU: changed the number of CPUs on VM ${vmName} from ${previousNumberOfCpus} to ${numberOfCpus}</td>
</tr>
<tr>
<td>2034</td>
<td>FAILED_HOT_SET_NUMBER_OF_CPUS</td>
<td>Error</td>
<td>Failed to hot set number of CPUs to VM ${vmName}. Underlying error message: ${ErrorMessage}</td>
</tr>
<tr>
<td>2035</td>
<td>USER_ISCSI_BOND_HOST_RESTART_WARNING</td>
<td>Warning</td>
<td>The following Networks has been removed from the iSCSI bond ${IscsiBondName}: ${NetworkNames}. for those changes to take affect, the hosts must be moved to maintenance and activated again.</td>
</tr>
<tr>
<td>2036</td>
<td>ADD_DISK_INTERNAL</td>
<td>Info</td>
<td>Add-Disk operation of '${DiskAlias}' was initiated by the system.</td>
</tr>
<tr>
<td>2037</td>
<td>ADD_DISK_INTERNAL_FAILURE</td>
<td>Info</td>
<td>Add-Disk operation of '${DiskAlias}' failed to complete.</td>
</tr>
<tr>
<td>2038</td>
<td>USER_REMOVE_DISK_INITIATED</td>
<td>Info</td>
<td>Removal of Disk ${DiskAlias} from domain ${StorageDomainName} was initiated by ${UserName}.</td>
</tr>
<tr>
<td>2039</td>
<td>HOT_SET_MEMORY</td>
<td>Info</td>
<td>Hotset memory: changed the amount of memory on VM ${vmName} from ${previousMem} to ${newMem}</td>
</tr>
<tr>
<td>2040</td>
<td>FAILED_HOT_SET_MEMORY</td>
<td>Error</td>
<td>Failed to hot set memory to VM ${vmName}. Underlying error message: ${ErrorMessage}</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>3000</td>
<td>USER_ADD_QUOTA</td>
<td>Info</td>
<td>Quota ${QuotaName} has been added by ${UserName}.</td>
</tr>
<tr>
<td>3001</td>
<td>USER_FAILED_ADD_QUOTA</td>
<td>Error</td>
<td>Failed to add Quota ${QuotaName}. The operation was initiated by ${UserName}.</td>
</tr>
<tr>
<td>3002</td>
<td>USER_UPDATE_QUOTA</td>
<td>Info</td>
<td>Quota ${QuotaName} has been updated by ${UserName}.</td>
</tr>
<tr>
<td>3003</td>
<td>USER_FAILED_UPDATE_QUOTA</td>
<td>Error</td>
<td>Failed to update Quota ${QuotaName}. The operation was initiated by ${UserName}.</td>
</tr>
<tr>
<td>3004</td>
<td>USER_DELETE_QUOTA</td>
<td>Info</td>
<td>Quota ${QuotaName} has been deleted by ${UserName}.</td>
</tr>
<tr>
<td>3005</td>
<td>USER_FAILED_DELETE_QUOTA</td>
<td>Error</td>
<td>Failed to delete Quota ${QuotaName}. The operation was initiated by ${UserName}.</td>
</tr>
<tr>
<td>3006</td>
<td>USER_EXCEEDED_QUOTA_VDS_GROUP_GRACE_LIMIT</td>
<td>Error</td>
<td>Cluster-Quota ${QuotaName} limit exceeded and operation was blocked. Utilization: ${Utilization}, Requested: ${Requested} - Please select a different quota or contact your administrator to extend the quota.</td>
</tr>
<tr>
<td>3007</td>
<td>USER_EXCEEDED_QUOTA_VDS_GROUP_LIMIT</td>
<td>Warning</td>
<td>Cluster-Quota ${QuotaName} limit exceeded and entered the grace zone. Utilization: ${Utilization} (It is advised to select a different quota or contact your administrator to extend the quota).</td>
</tr>
<tr>
<td>3008</td>
<td>USER_EXCEEDED_QUOTA_VDS_GROUP_THRESHOLD</td>
<td>Warning</td>
<td>Cluster-Quota ${QuotaName} is about to exceed. Utilization: ${Utilization}</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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</tr>
<tr>
<td>3009</td>
<td>USER_EXCEEDED_QUOTA_STORAGE_GRACE_LIMIT</td>
<td>Error</td>
<td>Storage-Quota ${QuotaName} limit exceeded and operation was blocked. Utilization(used/requested): ${CurrentStorage}%/${Requested}% - Please select a different quota or contact your administrator to extend the quota.</td>
</tr>
<tr>
<td>3010</td>
<td>USER_EXCEEDED_QUOTA_STORAGE_LIMIT</td>
<td>Warning</td>
<td>Storage-Quota ${QuotaName} limit exceeded and entered the grace zone. Utilization: ${CurrentStorage}% (It is advised to select a different quota or contact your administrator to extend the quota).</td>
</tr>
<tr>
<td>3011</td>
<td>USER_EXCEEDED_QUOTA_STORAGE_THRESHOLD</td>
<td>Warning</td>
<td>Storage-Quota ${QuotaName} is about to exceed. Utilization: ${CurrentStorage}%</td>
</tr>
<tr>
<td>3012</td>
<td>QUOTA_STORAGE_RESIZE_LOWER_THAN_CONSUMPTION</td>
<td>Warning</td>
<td>Storage-Quota ${QuotaName}: the new size set for this quota is less than current disk utilization.</td>
</tr>
<tr>
<td>3013</td>
<td>MISSING_QUOTA_STORAGE_PARAMETERS_PERMISSIVE_MODE</td>
<td>Warning</td>
<td>Missing Quota for Disk, proceeding since in Permissive (Audit) mode.</td>
</tr>
<tr>
<td>3014</td>
<td>MISSING_QUOTA_CLUSTER_PARAMETERS_PERMISSIVE_MODE</td>
<td>Warning</td>
<td>Missing Quota for VM ${VmName}, proceeding since in Permissive (Audit) mode.</td>
</tr>
<tr>
<td>3015</td>
<td>USER_EXCEEDED_QUOTA_VDS_GROUP_GRACE_LIMIT_PERMISSIVE_MODE</td>
<td>Warning</td>
<td>Cluster-Quota ${QuotaName} limit exceeded, proceeding since in Permissive (Audit) mode. Utilization: ${Utilization}, Requested: ${Requested} - Please select a different quota or contact your administrator to extend the quota.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
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</tr>
<tr>
<td>3016</td>
<td>USER_EXCEEDED_QUOTA_STORAGE_GRACE_LIMIT_PERMISSIVE_MODE</td>
<td>Warning</td>
<td>Storage-Quota ${QuotaName} limit exceeded, proceeding since in Permissive (Audit) mode. Utilization(used/requested): ${CurrentStorage}%/${Requested}% - Please select a different quota or contact your administrator to extend the quota.</td>
</tr>
<tr>
<td>4000</td>
<td>GLUSTER_VOLUME_CREATE</td>
<td>Info</td>
<td>Gluster Volume ${glusterVolumeName} created on cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>4001</td>
<td>GLUSTER_VOLUME_CREATE_FAILED</td>
<td>Error</td>
<td>Creation of Gluster Volume ${glusterVolumeName} failed on cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>4002</td>
<td>GLUSTER_VOLUME_OPTION_ADDED</td>
<td>Info</td>
<td>Volume Option ${Key}</td>
</tr>
<tr>
<td>4003</td>
<td>GLUSTER_VOLUME_OPTION_SET_FAILED</td>
<td>Error</td>
<td>Volume Option ${Key}</td>
</tr>
<tr>
<td>4004</td>
<td>GLUSTER_VOLUME_START</td>
<td>Info</td>
<td>Gluster Volume ${glusterVolumeName} of cluster ${vdsGroupName} started.</td>
</tr>
<tr>
<td>4005</td>
<td>GLUSTER_VOLUME_START_FAILED</td>
<td>Error</td>
<td>Could not start Gluster Volume ${glusterVolumeName} of cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>4006</td>
<td>GLUSTER_VOLUME_STOP</td>
<td>Info</td>
<td>Gluster Volume ${glusterVolumeName} stopped on cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>4007</td>
<td>GLUSTER_VOLUME_STOP_FAILED</td>
<td>Error</td>
<td>Could not stop Gluster Volume ${glusterVolumeName} on cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>4008</td>
<td>GLUSTER_VOLUME_OPTIONS_RESET</td>
<td>Info</td>
<td>Volume Option ${Key}</td>
</tr>
<tr>
<td>4009</td>
<td>GLUSTER_VOLUME_OPTIONS_RESET_FAILED</td>
<td>Error</td>
<td>Could not reset Gluster Volume ${glusterVolumeName} Options on cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
<td>--------</td>
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<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>4010</td>
<td>GLUSTER_VOLUME_DELETE</td>
<td>Info</td>
<td>Gluster Volume ${glusterVolumeName} deleted on cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>4011</td>
<td>GLUSTER_VOLUME_DELETE_FAILED</td>
<td>Error</td>
<td>Could not delete Gluster Volume ${glusterVolumeName} on cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>4012</td>
<td>GLUSTER_VOLUME_REBALANCE_START</td>
<td>Info</td>
<td>Gluster Volume ${glusterVolumeName} rebalance started on cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>4013</td>
<td>GLUSTER_VOLUME_REBALANCE_START_FAILED</td>
<td>Error</td>
<td>Could not start Gluster Volume ${glusterVolumeName} rebalance on cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>4014</td>
<td>GLUSTER_VOLUME_REMOVE_BRICKS</td>
<td>Info</td>
<td>Bricks removed from Gluster Volume ${glusterVolumeName} of cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>4015</td>
<td>GLUSTER_VOLUME_REMOVE_BRICKS_FAILED</td>
<td>Error</td>
<td>Could not remove bricks from Gluster Volume ${glusterVolumeName} of cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>4016</td>
<td>GLUSTER_VOLUME_REPLACE_BRICK_FAILED</td>
<td>Error</td>
<td>Replace Gluster Volume ${glusterVolumeName} Brick failed on cluster ${vdsGroupName}</td>
</tr>
<tr>
<td>4017</td>
<td>GLUSTER_VOLUME_REPLACE_BRICK_START</td>
<td>Info</td>
<td>Gluster Volume ${glusterVolumeName} Replace Brick started on cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>4018</td>
<td>GLUSTER_VOLUME_REPLACE_BRICK_START_FAILED</td>
<td>Error</td>
<td>Could not start Gluster Volume ${glusterVolumeName} Replace Brick on cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>4019</td>
<td>GLUSTER_VOLUME_ADD_BRICK</td>
<td>Info</td>
<td>${NoOfBricks} brick(s) added to volume ${glusterVolumeName} of cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
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</tr>
<tr>
<td>4020</td>
<td>GLUSTER_VOLUME_ADD_BRICK_FAILED</td>
<td>Error</td>
<td>Failed to add bricks to the Gluster Volume ${glusterVolumeName} of cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>4021</td>
<td>GLUSTER_SERVER_REMOVAL_FAILED</td>
<td>Error</td>
<td>Failed to remove host ${VdsName} from Cluster ${VdsGroupName}.</td>
</tr>
<tr>
<td>4022</td>
<td>GLUSTER_VOLUME_PROFILE_START</td>
<td>Info</td>
<td>Gluster Volume ${glusterVolumeName} profiling started on cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>4023</td>
<td>GLUSTER_VOLUME_PROFILE_START_FAILED</td>
<td>Error</td>
<td>Could not start profiling on gluster volume ${glusterVolumeName} of cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>4024</td>
<td>GLUSTER_VOLUME_PROFILE_STOP</td>
<td>Info</td>
<td>Gluster Volume ${glusterVolumeName} profiling stopped on cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>4025</td>
<td>GLUSTER_VOLUME_PROFILE_STOP_FAILED</td>
<td>Error</td>
<td>Could not stop Profiling on gluster volume ${glusterVolumeName} of cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>4026</td>
<td>GLUSTER_VOLUME_CREATED_FROM_CLI</td>
<td>Warning</td>
<td>Detected new volume ${glusterVolumeName} on cluster ${vdsGroupName}, and added it to engine DB.</td>
</tr>
<tr>
<td>4027</td>
<td>GLUSTER_VOLUME_DELETED_FROM_CLI</td>
<td>Info</td>
<td>Detected deletion of volume ${glusterVolumeName} on cluster ${vdsGroupName}, and deleted it from engine DB.</td>
</tr>
<tr>
<td>4028</td>
<td>GLUSTER_VOLUME_OPTION_SET_FROM_CLI</td>
<td>Warning</td>
<td>Detected new option ${key}</td>
</tr>
<tr>
<td>4029</td>
<td>GLUSTER_VOLUME_OPTION_RESET_FROM_CLI</td>
<td>Warning</td>
<td>Detected option ${key}</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
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</tr>
<tr>
<td>4030</td>
<td>GLUSTER_VOLUME_PROPERTIES_CHANGED_FROM_CLI</td>
<td>Warning</td>
<td>Detected changes in properties of volume ${glusterVolumeName} of cluster ${VdsGroupName}, and updated the same in engine DB.</td>
</tr>
<tr>
<td>4031</td>
<td>GLUSTER_VOLUME_BRICK_ADDED_FROM_CLI</td>
<td>Warning</td>
<td>Detected new brick ${brick} on volume ${glusterVolumeName} of cluster ${VdsGroupName}, and added it to engine DB.</td>
</tr>
<tr>
<td>4032</td>
<td>GLUSTER_VOLUME_BRICK_REMOVED_FROM_CLI</td>
<td>Info</td>
<td>Detected brick ${brick} removed from Volume ${glusterVolumeName} of cluster ${VdsGroupName}, and removed it from engine DB.</td>
</tr>
<tr>
<td>4033</td>
<td>GLUSTER_SERVER_REMOVED_FROM_CLI</td>
<td>Info</td>
<td>Detected server ${VdsName} removed from Cluster ${VdsGroupName}, and removed it from engine DB.</td>
</tr>
<tr>
<td>4034</td>
<td>GLUSTER_VOLUME_INFO_FAILED</td>
<td>Error</td>
<td>Failed to fetch gluster volume list from server ${VdsName}.</td>
</tr>
<tr>
<td>4035</td>
<td>GLUSTER_COMMAND_FAILED</td>
<td>Error</td>
<td>Gluster command [${Command}] failed on server ${VdsName}.</td>
</tr>
<tr>
<td>4038</td>
<td>GLUSTER_SERVER_REMOVED</td>
<td>Info</td>
<td>Host ${VdsName} removed from Cluster ${VdsGroupName}.</td>
</tr>
<tr>
<td>4039</td>
<td>GLUSTER_VOLUME_STARTED_FROM_CLI</td>
<td>Warning</td>
<td>Detected that Volume ${glusterVolumeName} of Cluster ${VdsGroupName} was started, and updated engine DB with it's new status.</td>
</tr>
<tr>
<td>4040</td>
<td>GLUSTER_VOLUME_STOPPED_FROM_CLI</td>
<td>Warning</td>
<td>Detected that Volume ${glusterVolumeName} of Cluster ${VdsGroupName} was stopped, and updated engine DB with it's new status.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
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<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>4041</td>
<td>GLUSTER_VOLUME_OPTION_CHANGED_FROM_CLI</td>
<td>Info</td>
<td>Detected change in value of option ${key} from ${oldValue} to ${newValue} on volume ${glusterVolumeName} of cluster ${VdsGroupName}, and updated it to engine DB.</td>
</tr>
<tr>
<td>4042</td>
<td>GLUSTER_HOOK_ENABLE</td>
<td>Info</td>
<td>Gluster Hook ${GlusterHookName} enabled on cluster ${VdsGroupName}.</td>
</tr>
<tr>
<td>4043</td>
<td>GLUSTER_HOOK_ENABLE_FAILED</td>
<td>Error</td>
<td>Failed to enable Gluster Hook ${GlusterHookName} on cluster ${VdsGroupName}. ${FailureMessage}</td>
</tr>
<tr>
<td>4044</td>
<td>GLUSTER_HOOK_ENABLE_PARTIAL</td>
<td>Warning</td>
<td>Gluster Hook ${GlusterHookName} enabled on some of the servers on cluster ${VdsGroupName}. ${FailureMessage}</td>
</tr>
<tr>
<td>4045</td>
<td>GLUSTER_HOOK_DISABLE</td>
<td>Info</td>
<td>Gluster Hook ${GlusterHookName} disabled on cluster ${VdsGroupName}.</td>
</tr>
<tr>
<td>4046</td>
<td>GLUSTER_HOOK_DISABLE_FAILED</td>
<td>Error</td>
<td>Failed to disable Gluster Hook ${GlusterHookName} on cluster ${VdsGroupName}. ${FailureMessage}</td>
</tr>
<tr>
<td>4047</td>
<td>GLUSTER_HOOK_DISABLE_PARTIAL</td>
<td>Warning</td>
<td>Gluster Hook ${GlusterHookName} disabled on some of the servers on cluster ${VdsGroupName}. ${FailureMessage}</td>
</tr>
<tr>
<td>4048</td>
<td>GLUSTER_HOOK_LIST_FAILED</td>
<td>Error</td>
<td>Failed to retrieve hook list from ${VdsName} of Cluster ${VdsGroupName}.</td>
</tr>
<tr>
<td>4049</td>
<td>GLUSTER_HOOK_CONFLICT_DETECTED</td>
<td>Warning</td>
<td>Detected conflict in hook ${HookName} of Cluster ${VdsGroupName}.</td>
</tr>
<tr>
<td>4050</td>
<td>GLUSTER_HOOK_DETECTED_NEW</td>
<td>Info</td>
<td>Detected new hook ${HookName} in Cluster ${VdsGroupName}.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
<td>--------</td>
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<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>4051</td>
<td>GLUSTER_HOOK_DETECTED_DELETE</td>
<td>Info</td>
<td>Detected removal of hook ${HookName} in Cluster ${VdsGroupName}.</td>
</tr>
<tr>
<td>4052</td>
<td>GLUSTER_VOLUME_OPTION_MODIFIED</td>
<td>Info</td>
<td>Volume Option ${Key} changed to ${Value} from ${oldvalue} on ${glusterVolumeName} of cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>4053</td>
<td>GLUSTER_HOOK_GETCONTENT_FAILED</td>
<td>Error</td>
<td>Failed to read content of hook ${HookName} in Cluster ${VdsGroupName}.</td>
</tr>
<tr>
<td>4054</td>
<td>GLUSTER_SERVICES_LIST_FAILED</td>
<td>Error</td>
<td>Could not fetch statuses of services from server ${VdsName}. Updating statuses of all services on this server to UNKNOWN.</td>
</tr>
<tr>
<td>4055</td>
<td>GLUSTER_SERVICE_TYPE_ADDED_TO_CLUSTER</td>
<td>Info</td>
<td>Service type ${ServiceType} was not mapped to cluster ${VdsGroupName}. Mapped it now.</td>
</tr>
<tr>
<td>4056</td>
<td>GLUSTER_CLUSTER_SERVICE_STATUS_CHANGED</td>
<td>Info</td>
<td>Status of service type ${ServiceType} changed from ${OldStatus} to ${NewStatus} on cluster ${VdsGroupName}</td>
</tr>
<tr>
<td>4057</td>
<td>GLUSTER_SERVICE_ADDED_TO_SERVER</td>
<td>Info</td>
<td>Service ${ServiceName} was not mapped to server ${VdsName}. Mapped it now.</td>
</tr>
<tr>
<td>4058</td>
<td>GLUSTER_SERVER_SERVICE_STATUS_CHANGED</td>
<td>Info</td>
<td>Status of service ${ServiceName} on server ${VdsName} changed from ${OldStatus} to ${NewStatus}. Updating in engine now.</td>
</tr>
<tr>
<td>4059</td>
<td>GLUSTER_HOOK_UPDATED</td>
<td>Info</td>
<td>Gluster Hook ${GlusterHookName} updated on conflicting servers.</td>
</tr>
<tr>
<td>4060</td>
<td>GLUSTER_HOOK_UPDATE_FAILED</td>
<td>Error</td>
<td>Failed to update Gluster Hook ${GlusterHookName} on conflicting servers. ${FailureMessage}</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
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<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>4061</td>
<td>GLUSTER_HOOK_ADDED</td>
<td>Info</td>
<td>Gluster Hook ${GlusterHookName} added on conflicting servers.</td>
</tr>
<tr>
<td>4062</td>
<td>GLUSTER_HOOK_ADD_FAILED</td>
<td>Error</td>
<td>Failed to add Gluster Hook ${GlusterHookName} on conflicting servers.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>${FailureMessage}</td>
</tr>
<tr>
<td>4063</td>
<td>GLUSTER_HOOK_REMOVED</td>
<td>Info</td>
<td>Gluster Hook ${GlusterHookName} removed from all servers in cluster</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>${VdsGroupName}.</td>
</tr>
<tr>
<td>4064</td>
<td>GLUSTER_HOOK_REMOVE_FAILED</td>
<td>Error</td>
<td>Failed to remove Gluster Hook ${GlusterHookName} from cluster</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>${VdsGroupName}.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>${FailureMessage}</td>
</tr>
<tr>
<td>4065</td>
<td>GLUSTER_HOOK_REFRESH</td>
<td>Info</td>
<td>Refreshed gluster hooks in Cluster ${VdsGroupName}.</td>
</tr>
<tr>
<td>4066</td>
<td>GLUSTER_HOOK_REFRESH_FAILED</td>
<td>Error</td>
<td>Failed to refresh gluster hooks in Cluster ${VdsGroupName}.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>${FailureMessage}</td>
</tr>
<tr>
<td>4067</td>
<td>GLUSTER_SERVICE_STARTED</td>
<td>Info</td>
<td>${servicetype} service started on host ${VdsName} of cluster</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>${VdsGroupName}.</td>
</tr>
<tr>
<td>4068</td>
<td>GLUSTER_SERVICE_START_FAILED</td>
<td>Error</td>
<td>Could not start ${servicetype} service on host ${VdsName} of cluster</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>${VdsGroupName}.</td>
</tr>
<tr>
<td>4069</td>
<td>GLUSTER_SERVICE_STOPPED</td>
<td>Info</td>
<td>${servicetype} services stopped on host ${VdsName} of cluster</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>${VdsGroupName}.</td>
</tr>
<tr>
<td>4070</td>
<td>GLUSTER_SERVICE_STOP_FAILED</td>
<td>Error</td>
<td>Could not stop ${servicetype} service on host ${VdsName} of cluster</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>${VdsGroupName}.</td>
</tr>
<tr>
<td>4071</td>
<td>GLUSTER_SERVICES_LIST_NOT_FETCHE</td>
<td>Info</td>
<td>Could not fetch list of services from</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>${ServiceGroupType} named ${ServiceGroupName}.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
<td>-------</td>
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<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>4072</td>
<td>GLUSTER_SERVICE_RESTARTED</td>
<td>Info</td>
<td>${servicetype} service restarted on host ${VdsName} on cluster ${VdsGroupName}.</td>
</tr>
<tr>
<td>4073</td>
<td>GLUSTER_SERVICE_RESTART_FAILED</td>
<td>Error</td>
<td>Could not re-start ${servicetype} service on host ${VdsName} on cluster ${VdsGroupName}.</td>
</tr>
<tr>
<td>4074</td>
<td>GLUSTER_VOLUME_OPTIONS_RESET_ALL</td>
<td>Info</td>
<td>All Volume Options reset on ${glusterVolumeName} of cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>4075</td>
<td>GLUSTER_HOST_UUID_NOT_FOUND</td>
<td>Error</td>
<td>Could not find gluster uuid of server ${VdsName} on Cluster ${VdsGroupName}.</td>
</tr>
<tr>
<td>4076</td>
<td>GLUSTER_VOLUME_BRICK_ADDED</td>
<td>Info</td>
<td>Brick [${brickpath}] on host [${servername}] added to volume [${glusterVolumeName}]</td>
</tr>
<tr>
<td>4077</td>
<td>GLUSTER_CLUSTER_SERVICE_STATUS_ADDED</td>
<td>Info</td>
<td>Status of service type ${ServiceType} set to ${NewStatus} on cluster ${VdsGroupName}</td>
</tr>
<tr>
<td>4078</td>
<td>GLUSTER_VOLUME_REBALANCE_STOP</td>
<td>Info</td>
<td>Gluster Volume ${glusterVolumeName} rebalance stopped of cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>4079</td>
<td>GLUSTER_VOLUME_REBALANCE_STOP_FAILED</td>
<td>Error</td>
<td>Could not stop rebalance of gluster volume ${glusterVolumeName} of cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>4080</td>
<td>START_REMOVING_GLUSTER_VOLUME_BRICKS</td>
<td>Info</td>
<td>Started removing bricks from Volume ${glusterVolumeName} of cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>4081</td>
<td>START_REMOVING_GLUSTER_VOLUME_BRICKS_FAILED</td>
<td>Error</td>
<td>Could not start remove bricks from Volume ${glusterVolumeName} of cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>4082</td>
<td>GLUSTER_VOLUME_REMOVING_BRICKS_STOP</td>
<td>Info</td>
<td>Stopped removing bricks from Volume ${glusterVolumeName} of cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
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<td>---------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>4083</td>
<td>GLUSTER_VOLUME_REMOVE_BRICKS_STOP_FAILED</td>
<td>Error</td>
<td>Failed to stop remove bricks from Volume ${glusterVolumeName} of cluster ${vdsGroupName}</td>
</tr>
<tr>
<td>4084</td>
<td>GLUSTER_VOLUME_REMOVE_BRICKS_COMMIT</td>
<td>Info</td>
<td>Gluster volume ${glusterVolumeName} remove bricks committed on cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>${NoOfBricks} brick(s) removed from volume ${glusterVolumeName}.</td>
</tr>
<tr>
<td>4085</td>
<td>GLUSTER_VOLUME_REMOVE_BRICKS_COMMIT_FAILED</td>
<td>Error</td>
<td>Gluster volume ${glusterVolumeName} remove bricks could not be committed on cluster ${vdsGroupName}</td>
</tr>
<tr>
<td>4086</td>
<td>GLUSTER_BRICK_STATUS_CHANGED</td>
<td>Warning</td>
<td>Detected change in status of brick ${brickpath} of volume ${glusterVolumeName} from</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>${oldValue} to ${newValue}.</td>
</tr>
<tr>
<td>4087</td>
<td>GLUSTER_VOLUME_REBALANCE_FINISHED</td>
<td>Info</td>
<td>${action} ${status} on volume ${glusterVolumeName} of cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>4088</td>
<td>GLUSTER_VOLUME_MIGRATE_BRICK_DATA_FINISHED</td>
<td>Info</td>
<td>${action} ${status} for brick(s) on volume ${glusterVolumeName} of cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Please review to abort or commit.</td>
</tr>
<tr>
<td>4089</td>
<td>GLUSTER_VOLUme_REBALANCE_STARTDETECTED_FROM_CLI</td>
<td>Info</td>
<td>Detected start of rebalance on volume ${glusterVolumeName} of Cluster ${VdsGroupName} from CLI.</td>
</tr>
<tr>
<td>4090</td>
<td>START_REMOVING_GLUSTER_VOLUME_BRICKS_DETECTED_FROM_CLI</td>
<td>Info</td>
<td>Detected start of brick removal for bricks ${brick} on volume ${glusterVolumeName} of Cluster ${VdsGroupName} from CLI.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
<td>--------</td>
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<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>4091</td>
<td>GLUSTER_VOLUME_REBALANCE_NOT_FOUND_FROM_CLI</td>
<td>Warning</td>
<td>Could not find information for rebalance on volume ${glusterVolumeName} of Cluster ${VdsGroupName} from CLI. Marking it as unknown.</td>
</tr>
<tr>
<td>4092</td>
<td>REMOVE_GLUSTER_VOLUME_BRICKS_NOT_FOUND_FROM_CLI</td>
<td>Warning</td>
<td>Could not find information for remove brick on volume ${glusterVolumeName} of Cluster ${VdsGroupName} from CLI. Marking it as unknown.</td>
</tr>
<tr>
<td>4093</td>
<td>GLUSTER_VOLUME_DETAILS_REFRESH</td>
<td>Info</td>
<td>Refreshed details of the volume ${glusterVolumeName} of cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>4094</td>
<td>GLUSTER_VOLUME_DETAILS_REFRESH_FAILED</td>
<td>Error</td>
<td>Failed to refresh the details of volume ${glusterVolumeName} of cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>4095</td>
<td>GLUSTER_HOST_UUID_ALREADY_EXISTS</td>
<td>Error</td>
<td>Gluster UUID of host ${VdsName} on Cluster ${VdsGroupName} already exists.</td>
</tr>
<tr>
<td>4096</td>
<td>USER_FORCE_SELECTED_SPM_STOP_FAILED</td>
<td>Error</td>
<td>Failed to force select ${VdsName} as the SPM due to a failure to stop the current SPM.</td>
</tr>
<tr>
<td>4097</td>
<td>GLUSTER_GEOREP_SESSION_DELETED_FROM_CLI</td>
<td>Warning</td>
<td>Detected deletion of geo-replication session ${geoRepSessionKey} from volume ${glusterVolumeName}</td>
</tr>
<tr>
<td>4098</td>
<td>GLUSTER_GEOREP_SESSION_DETECTED_FROM_CLI</td>
<td>Warning</td>
<td>Detected new geo-replication session ${geoRepSessionKey} for volume ${glusterVolumeName}. Adding it to engine.</td>
</tr>
<tr>
<td>4099</td>
<td>GLUSTER_GEOREP_SESSION_REFRESH</td>
<td>Info</td>
<td>Refreshed geo-replication sessions for volume ${glusterVolumeName}.</td>
</tr>
<tr>
<td>4100</td>
<td>GLUSTER_GEOREP_SESSION_REFRESH_FAILED</td>
<td>Error</td>
<td>Failed to refresh geo-replication sessions for volume ${glusterVolumeName}.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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</tr>
<tr>
<td>4101</td>
<td>GEOREP_SESSION_STOP</td>
<td>Info</td>
<td>Geo-replication session on volume <code>${glusterVolumeName}</code> has been stopped.</td>
</tr>
<tr>
<td>4102</td>
<td>GEOREP_SESSION_STOP_FAILED</td>
<td>Error</td>
<td>Failed to stop geo-replication session on volume <code>${glusterVolumeName}</code></td>
</tr>
<tr>
<td>4103</td>
<td>GEOREP_SESSION_DELETED</td>
<td>Info</td>
<td>Geo-replication session deleted on volume <code>${glusterVolumeName}</code></td>
</tr>
<tr>
<td>4104</td>
<td>GEOREP_SESSION_DELETE_FAILED</td>
<td>Error</td>
<td>Failed to delete geo-replication session on volume <code>${glusterVolumeName}</code></td>
</tr>
<tr>
<td>4105</td>
<td>GLUSTER_GEOREP_CONFIG_SET</td>
<td>Info</td>
<td>Configuration <code>${key}</code> has been set to <code>${value}</code> on the geo-rep session <code>${geoRepSessionKey}</code>.</td>
</tr>
<tr>
<td>4106</td>
<td>GLUSTER_GEOREP_CONFIG_SET_FAILED</td>
<td>Error</td>
<td>Failed to set the configuration <code>${key}</code> to <code>${value}</code> on geo-rep session <code>${geoRepSessionKey}</code>.</td>
</tr>
<tr>
<td>4107</td>
<td>GLUSTER_GEOREP_CONFIG_LIST</td>
<td>Info</td>
<td>Refreshed configuration options for geo-replication session <code>${geoRepSessionKey}</code></td>
</tr>
<tr>
<td>4108</td>
<td>GLUSTER_GEOREP_CONFIG_LIST_FAILED</td>
<td>Error</td>
<td>Failed to refresh configuration options for geo-replication session <code>${geoRepSessionKey}</code></td>
</tr>
<tr>
<td>4109</td>
<td>GLUSTER_GEOREP_CONFIG_SET_DEFAULT</td>
<td>Info</td>
<td>Configuration of <code>${key}</code> of session <code>${geoRepSessionKey}</code> reset to its default value.</td>
</tr>
<tr>
<td>4110</td>
<td>GLUSTER_GEOREP_CONFIG_SET_DEFAULT_FAILED</td>
<td>Error</td>
<td>Failed to set <code>${key}</code> of session <code>${geoRepSessionKey}</code> to its default value.</td>
</tr>
<tr>
<td>4111</td>
<td>GLUSTER_VOLUME_SNAPS_HOT_DELETED</td>
<td>Info</td>
<td>Gluster volume snapshot <code>${snapshotName}</code> deleted.</td>
</tr>
<tr>
<td>4112</td>
<td>GLUSTER_VOLUME_SNAPS_HOT_DELETE_FAILED</td>
<td>Error</td>
<td>Failed to delete gluster volume snapshot <code>${snapshotName}</code>.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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</tr>
<tr>
<td>4113</td>
<td>GLUSTER_VOLUME_ALL_SNAPSHOTS_DELETED</td>
<td>Info</td>
<td>Deleted all the gluster volume snapshots for the volume ${glusterVolumeName} of cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>4114</td>
<td>GLUSTER_VOLUME_ALL_SNAPSHOTS_DELETE_FAILED</td>
<td>Error</td>
<td>Failed to delete all the gluster volume snapshots for the volume ${glusterVolumeName} of cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>4115</td>
<td>GLUSTER_VOLUME_SNAPS_HOT_ACTIVATED</td>
<td>Info</td>
<td>Activated the gluster volume snapshot ${snapname} on volume ${glusterVolumeName} of cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>4116</td>
<td>GLUSTER_VOLUME_SNAPS_HOT_ACTIVATE_FAILED</td>
<td>Error</td>
<td>Failed to activate the gluster volume snapshot ${snapname} on volume ${glusterVolumeName} of cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>4117</td>
<td>GLUSTER_VOLUME_SNAPS_HOT_DEACTIVATED</td>
<td>Info</td>
<td>De-activated the gluster volume snapshot ${snapname} on volume ${glusterVolumeName} of cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>4118</td>
<td>GLUSTER_VOLUME_SNAPS_HOT_DEACTIVATE_FAILED</td>
<td>Error</td>
<td>Failed to de-activate gluster volume snapshot ${snapname} on volume ${glusterVolumeName} of cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>4119</td>
<td>GLUSTER_VOLUME_SNAPS_HOT_RESTORED</td>
<td>Info</td>
<td>Restored the volume ${glusterVolumeName} of cluster ${vdsGroupName} to the state of gluster volume snapshot ${snapname}.</td>
</tr>
<tr>
<td>4120</td>
<td>GLUSTER_VOLUME_SNAPS_HOT_RESTORE_FAILED</td>
<td>Error</td>
<td>Failed to restore the volume ${glusterVolumeName} of cluster ${vdsGroupName} to the state of gluster volume snapshot ${snapname}.</td>
</tr>
<tr>
<td>4121</td>
<td>GLUSTER_VOLUME_SNAPS_HOT_CONFIG_UPDATED</td>
<td>Info</td>
<td>Updated Gluster volume snapshot configuration(s).</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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</tr>
<tr>
<td>4122</td>
<td>GLUSTER_VOLUME_SNAPS HOT_CONFIG_UPDATE_FAILED</td>
<td>Error</td>
<td>Failed to update gluster volume snapshot configuration(s).</td>
</tr>
<tr>
<td>4123</td>
<td>GLUSTER_VOLUME_SNAPS HOT_CONFIG_UPDATE_FAILED_PARTIALLY</td>
<td>Error</td>
<td>Failed to update gluster volume snapshot configuration(s) ${failedSnapshotConfigs}.</td>
</tr>
<tr>
<td>4124</td>
<td>NEW_STORAGE_DEVICE_DETECTED</td>
<td>Info</td>
<td>Found new storage device ${storageDevice} on host ${VdsName}, and added it to engine DB.</td>
</tr>
<tr>
<td>4125</td>
<td>STORAGE_DEVICE_REMOVED_FROM_THE_HOST</td>
<td>Info</td>
<td>Detected deletion of storage device ${storageDevice} on host ${VdsName}, and deleting it from engine DB.</td>
</tr>
<tr>
<td>4126</td>
<td>SYNC_STORAGE_DEVICES_IN_HOST</td>
<td>Info</td>
<td>Manually synced the storage devices from host ${VdsName}</td>
</tr>
<tr>
<td>4127</td>
<td>SYNC_STORAGE_DEVICES_IN_HOST_FAILED</td>
<td>Error</td>
<td>Failed to sync storage devices from host ${VdsName}</td>
</tr>
<tr>
<td>4128</td>
<td>GEOREP_OPTION_SET_FROM_CLI</td>
<td>Warning</td>
<td>Detected new option ${key}</td>
</tr>
<tr>
<td>4129</td>
<td>GEOREP_OPTION_CHANGED_FROM_CLI</td>
<td>Warning</td>
<td>Detected change in value of option ${key} from ${oldValue} to ${value} for geo-replication session on volume ${glusterVolumeName} of cluster ${vdsGroupName}, and updated it to engine.</td>
</tr>
<tr>
<td>4130</td>
<td>GLUSTER_MASTER_VOLUME_STOP_FAILED_DURING_SNAPSHOT_RESTORE</td>
<td>Error</td>
<td>Could not stop master volume ${glusterVolumeName} of cluster ${vdsGroupName} during snapshot restore.</td>
</tr>
<tr>
<td>4131</td>
<td>GLUSTER_MASTER_VOLUME_SNAPSHOT_RESTORE_FAILED</td>
<td>Error</td>
<td>Could not restore master volume ${glusterVolumeName} of cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>4132</td>
<td>GLUSTER_VOLUME_SNAPS HOT_CREATED</td>
<td>Info</td>
<td>Snapshot ${snapname} created for volume ${glusterVolumeName} of cluster ${vdsGroupName}.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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</tr>
<tr>
<td>4133</td>
<td>GLUSTER_VOLUME_SNAPS_HOT_CREATE_FAILED</td>
<td>Error</td>
<td>Could not create snapshot for volume $glusterVolumeName of cluster $vdsGroupName.</td>
</tr>
<tr>
<td>4134</td>
<td>GLUSTER_VOLUME_SNAPS_HOT_SCHEDULED</td>
<td>Info</td>
<td>Snapshots scheduled on volume $glusterVolumeName of cluster $vdsGroupName.</td>
</tr>
<tr>
<td>4135</td>
<td>GLUSTER_VOLUME_SNAPS_HOT_SCHEDULE_FAILED</td>
<td>Error</td>
<td>Failed to schedule snapshots on the volume $glusterVolumeName of cluster $vdsGroupName.</td>
</tr>
<tr>
<td>4136</td>
<td>GLUSTER_VOLUME_SNAPS_HOT_RESCHEDULED</td>
<td>Info</td>
<td>Rescheduled snapshots on volume $glusterVolumeName of cluster $vdsGroupName.</td>
</tr>
<tr>
<td>4137</td>
<td>GLUSTER_VOLUME_SNAPS_HOT_RESCHEDULE_FAILED</td>
<td>Error</td>
<td>Failed to reschedule snapshots on volume $glusterVolumeName of cluster $vdsGroupName.</td>
</tr>
<tr>
<td>4138</td>
<td>CREATE_GLUSTER_BRICK</td>
<td>Info</td>
<td>Brick $brickName created successfully on host $vdsName of cluster $vdsGroupName.</td>
</tr>
<tr>
<td>4139</td>
<td>CREATE_GLUSTER_BRICK_FAILED</td>
<td>Error</td>
<td>Failed to create brick $brickName on host $vdsName of cluster $vdsGroupName.</td>
</tr>
<tr>
<td>4140</td>
<td>GLUSTER_GEO_REP_PUBLIC_KEY_FETCH_FAILED</td>
<td>Error</td>
<td>Failed to fetch public keys.</td>
</tr>
<tr>
<td>4141</td>
<td>GLUSTER_GET_PUBLIC_KEY</td>
<td>Info</td>
<td>Public key fetched.</td>
</tr>
<tr>
<td>4142</td>
<td>GLUSTER_GEOREP_PUBLIC_KEY_WRITE_FAILED</td>
<td>Error</td>
<td>Failed to write public keys to $VdsName</td>
</tr>
<tr>
<td>4143</td>
<td>GLUSTER_WRITE_PUBLIC_KEYS</td>
<td>Info</td>
<td>Public keys written to $VdsName</td>
</tr>
<tr>
<td>4144</td>
<td>GLUSTER_GEOREP_SETUP_MOUNT_BROKER_FAILED</td>
<td>Error</td>
<td>Failed to setup geo-replication mount broker for user $geoRepUserName on the slave volume $geoRepSlaveVolumeName.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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</tr>
<tr>
<td>4145</td>
<td>GLUSTER_SETUP_GEOREP_MOUNT_BROKER</td>
<td>Info</td>
<td>Geo-replication mount broker has been setup for user <code>${geoRepUserName}</code> on the slave volume <code>${geoRepSlaveVolumeName}</code>.</td>
</tr>
<tr>
<td>4146</td>
<td>GLUSTER_GEOREP_SESSION_CREATE_FAILED</td>
<td>Error</td>
<td>Failed to create geo-replication session between master volume : <code>${glusterVolumeName}</code> of cluster <code>${vdsGroupName}</code> and slave volume : <code>${geoRepSlaveVolumeName}</code> for the user <code>${geoRepUserName}</code>.</td>
</tr>
<tr>
<td>4147</td>
<td>CREATE_GLUSTER_VOLUME_GEOREP_SESSION</td>
<td>Info</td>
<td>Created geo-replication session between master volume : <code>${glusterVolumeName}</code> of cluster <code>${vdsGroupName}</code> and slave volume : <code>${geoRepSlaveVolumeName}</code> for the user <code>${geoRepUserName}</code>.</td>
</tr>
<tr>
<td>4148</td>
<td>GLUSTER_VOLUME_SNAPS_HOT_SOFT_LIMIT_REACHED</td>
<td>Info</td>
<td>Gluster Volume Snapshot soft limit reached for the volume <code>${glusterVolumeName}</code> on cluster <code>${vdsGroupName}</code>.</td>
</tr>
<tr>
<td>4149</td>
<td>HOST_FEATURES_INCOMPATIBLE_WITH_CLUSTER</td>
<td>Error</td>
<td>Host <code>${VdsName}</code> does not comply with the list of features supported by cluster <code>${vdsGroupName}</code>. <code>${UnSupportedFeature}</code> is not supported by the Host.</td>
</tr>
<tr>
<td>4150</td>
<td>GLUSTER_VOLUME_SNAPS_HOT_SCHEDULE_DELETED</td>
<td>Info</td>
<td>Snapshot schedule deleted for volume <code>${glusterVolumeName}</code> of cluster <code>${vdsGroupName}</code>.</td>
</tr>
<tr>
<td>4151</td>
<td>GLUSTER_BRICK_STATUS_DOWN</td>
<td>Info</td>
<td>Status of brick <code>${brickpath}</code> of volume <code>${glusterVolumeName}</code> on cluster <code>${vdsGroupName}</code> is down.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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</tr>
<tr>
<td>4152</td>
<td>GLUSTER_VOLUME_SNAPS HOT_DETECTED_NEW</td>
<td>Info</td>
<td>Found new gluster volume snapshot <code>${snapname}</code> for volume <code>${glusterVolumeName}</code> on cluster <code>${VdsGroupName}</code>, and added it to engine DB.&quot;</td>
</tr>
<tr>
<td>4153</td>
<td>GLUSTER_VOLUME_SNAPS HOT_DELETED_FROM_CLI</td>
<td>Info</td>
<td>Detected deletion of gluster volume snapshot <code>${snapname}</code> for volume <code>${glusterVolumeName}</code> on cluster <code>${VdsGroupName}</code>, and deleting it from engine DB.&quot;</td>
</tr>
<tr>
<td>4154</td>
<td>GLUSTER_VOLUME_SNAPS HOT_CLUSTER_CONFIG_DETECTED_NEW</td>
<td>Info</td>
<td>Found new gluster volume snapshot configuration <code>${snapConfigName}</code> with value <code>${snapConfigValue}</code> on cluster <code>${VdsGroupName}</code>, and added it to engine DB.&quot;</td>
</tr>
<tr>
<td>4155</td>
<td>GLUSTER_VOLUME_SNAPS HOT_VOLUME_CONFIG_DETECTED_NEW</td>
<td>Info</td>
<td>Found new gluster volume snapshot configuration <code>${snapConfigName}</code> with value <code>${snapConfigValue}</code> for volume <code>${glusterVolumeName}</code> on cluster <code>${VdsGroupName}</code>, and added it to engine DB.&quot;</td>
</tr>
<tr>
<td>4156</td>
<td>GLUSTER_VOLUME_SNAPS HOT_HARD_LIMIT_REACHED</td>
<td>Info</td>
<td>Gluster Volume Snapshot hard limit reached for the volume <code>${glusterVolumeName}</code> on cluster <code>${vdsGroupName}</code>.</td>
</tr>
<tr>
<td>4157</td>
<td>GLUSTER_CLI_SNAPSHOT_SCHEDULE_DISABLE_FAILED</td>
<td>Error</td>
<td>Failed to disable gluster CLI based snapshot schedule on cluster <code>${vdsGroupName}</code>.</td>
</tr>
<tr>
<td>4158</td>
<td>GLUSTER_CLI_SNAPSHOT_SCHEDULE_DISABLED</td>
<td>Info</td>
<td>Disabled gluster CLI based scheduling successfully on cluster <code>${vdsGroupName}</code>.</td>
</tr>
<tr>
<td>4159</td>
<td>SET_UP_PASSWORDLESS_SSH</td>
<td>Info</td>
<td>Password-less SSH has been setup for user <code>${geoRepUserName}</code> on the nodes of remote volume <code>${geoRepSlaveVolumeName}</code> from the nodes of the volume <code>${glusterVolumeName}</code>.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
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</tr>
<tr>
<td>4160</td>
<td>SET_UP_PASSWORDLESS_SSH_FAILED</td>
<td>Error</td>
<td>Failed to setup Passwordless ssh for user <code>${geoRepUserName}</code> on the nodes of remote volume <code>${geoRepSlaveVolumeName}</code> from the nodes of the volume <code>${glusterVolumeName}</code>.</td>
</tr>
<tr>
<td>4436</td>
<td>GLUSTER_SERVER_ADD_FAILED</td>
<td>Error</td>
<td>Failed to add host <code>${VdsName}</code> into Cluster <code>${VdsGroupName}</code>.</td>
</tr>
<tr>
<td>4437</td>
<td>GLUSTER_SERVERS_LIST_FAILED</td>
<td>Error</td>
<td>Failed to fetch gluster peer list from server <code>${VdsName}</code> on Cluster <code>${VdsGroupName}</code>.</td>
</tr>
<tr>
<td>4595</td>
<td>GLUSTER_VOLUME_GEO_REP_START_FAILED_EXCEPTION</td>
<td>Error</td>
<td>Failed to start geo-replication session on volume <code>${glusterVolumeName}</code></td>
</tr>
<tr>
<td>4596</td>
<td>GLUSTER_VOLUME_GEO_REP_START</td>
<td>Info</td>
<td>Geo-replication session on volume <code>${glusterVolumeName}</code> has been started.</td>
</tr>
<tr>
<td>4597</td>
<td>GLUSTER_VOLUME_GEO_REP_PAUSE_FAILED</td>
<td>Error</td>
<td>Failed to pause geo-replication session on volume <code>${glusterVolumeName}</code> of cluster <code>${vdsGroupName}</code></td>
</tr>
<tr>
<td>4598</td>
<td>GLUSTER_VOLUME_GEO_REP_RESUME_FAILED</td>
<td>Error</td>
<td>Failed to resume geo-replication session on volume <code>${glusterVolumeName}</code> of cluster <code>${vdsGroupName}</code></td>
</tr>
<tr>
<td>4599</td>
<td>GLUSTER_VOLUME_GEO_REP_RESUME</td>
<td>Info</td>
<td>Geo-replication session on volume <code>${glusterVolumeName}</code> of cluster <code>${vdsGroupName}</code> has been resumed.</td>
</tr>
<tr>
<td>4600</td>
<td>GLUSTER_VOLUME_GEO_REP_PAUSE</td>
<td>Info</td>
<td>Geo-replication session on volume <code>${glusterVolumeName}</code> of cluster <code>${vdsGroupName}</code> has been paused.</td>
</tr>
<tr>
<td>9000</td>
<td>VDS_ALERT_FENCE_IS_NOT_CONFIGURED</td>
<td>Info</td>
<td>Failed to verify Power Management configuration for Host <code>${VdsName}</code>.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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</tr>
<tr>
<td>9001</td>
<td>VDS_ALERT_FENCE_TEST_FAILED</td>
<td>Info</td>
<td>Power Management test failed for Host ${VdsName}.${Reason}</td>
</tr>
<tr>
<td>9002</td>
<td>VDS_ALERT_FENCE_OPERATION_FAILED</td>
<td>Info</td>
<td>Failed to power fence host ${VdsName}. Please check the host status and it's power management settings, and then manually reboot it and click &quot;Confirm Host Has Been Rebooted&quot;</td>
</tr>
<tr>
<td>9003</td>
<td>VDS_ALERT_FENCE_OPERATION_SKIPPED</td>
<td>Info</td>
<td>Host ${VdsName} became non responsive. It has no power management configured. Please check the host status, manually reboot it, and click &quot;Confirm Host Has Been Rebooted&quot;</td>
</tr>
<tr>
<td>9004</td>
<td>VDS_ALERT_FENCE_NO_PROXY_HOST</td>
<td>Info</td>
<td>There is no other host in the data center that can be used to test the power management settings.</td>
</tr>
<tr>
<td>9005</td>
<td>VDS_ALERT_FENCE_STATUS_VERIFICATION_FAILED</td>
<td>Info</td>
<td>Failed to verify Host ${Host} ${Status} status, Please ${Status} Host ${Host} manually.</td>
</tr>
<tr>
<td>9006</td>
<td>CANNOT_HIBERNATE_RUNNING_VMS_AFTER_CLUSTER_CPU_UPGRADE</td>
<td>Warning</td>
<td>Hibernation of VMs after CPU upgrade of Cluster ${VdsGroup} is not supported. Please stop and restart those VMs in case you wish to hibernate them</td>
</tr>
<tr>
<td>9007</td>
<td>VDS_ALERT_SECONDARY_AGENT_USED_FOR_FENCE_OPERATION</td>
<td>Info</td>
<td>Secondary fence agent was used to ${Operation} Host ${VdsName}</td>
</tr>
<tr>
<td>9008</td>
<td>VDS_HOST_NOT RESPONDING_CONNECTING</td>
<td>Warning</td>
<td>Host ${VdsName} is not responding. It will stay in Connecting state for a grace period of ${Seconds} seconds and after that an attempt to fence the host will be issued.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
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</tr>
<tr>
<td>9009</td>
<td>VDS_ALERT_PM_HEALTH_CHECK_FENCE_AGENT_NON_RESPONSIVE</td>
<td>Info</td>
<td>Health check on Host ${VdsName} indicates that Fence-Agent ${AgentId} is non-responsive.</td>
</tr>
<tr>
<td>9010</td>
<td>VDS_ALERT_PM_HEALTH_CHECK_START_MIGHT_FAIL</td>
<td>Info</td>
<td>Health check on Host ${VdsName} indicates that future attempts to Start this host using Power-Management are expected to fail.</td>
</tr>
<tr>
<td>9011</td>
<td>VDS_ALERT_PM_HEALTH_CHECK_STOP_MIGHT_FAIL</td>
<td>Info</td>
<td>Health check on Host ${VdsName} indicates that future attempts to Stop this host using Power-Management are expected to fail.</td>
</tr>
<tr>
<td>9012</td>
<td>VDS_ALERT_PM_HEALTH_CHECK_RESTART_MIGHT_FAIL</td>
<td>Info</td>
<td>Health check on Host ${VdsName} indicates that future attempts to Restart this host using Power-Management are expected to fail.</td>
</tr>
<tr>
<td>9013</td>
<td>VDS_ALERT_FENCE_OPERATION_SKIPPED_BROKEN_CONNECTIVITY</td>
<td>Info</td>
<td>Host ${VdsName} became non responsive and was not restarted due to Fencing Policy: ${Percents} percents of the Hosts in the Cluster have connectivity issues.</td>
</tr>
<tr>
<td>9014</td>
<td>VDS_ALERT_NOT_RESTARTED_DUE_TO_POLICY</td>
<td>Info</td>
<td>Host ${VdsName} became non responsive and was not restarted due to the Cluster Fencing Policy.</td>
</tr>
<tr>
<td>9015</td>
<td>VDS_ALERT_FENCE_DISABLED_BY_CLUSTER_POLICY</td>
<td>Info</td>
<td>Host ${VdsName} became Non Responsive and was not restarted due to disabled fencing in the Cluster Fencing Policy.</td>
</tr>
<tr>
<td>9016</td>
<td>FENCE_DISABLED_IN_CLUSTER_POLICY</td>
<td>Info</td>
<td>Fencing is disabled in Fencing Policy of the Cluster ${VdsGroupName}, so HA VMs running on a non-responsive host will not be restarted elsewhere.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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</tr>
<tr>
<td>9017</td>
<td>FENCE_OPERATION_STARTED</td>
<td>Info</td>
<td>Power management ${Action} of Host ${VdsName} initiated.</td>
</tr>
<tr>
<td>9018</td>
<td>FENCE_OPERATION_SUCCEEDED</td>
<td>Info</td>
<td>Power management ${Action} of Host ${VdsName} succeeded.</td>
</tr>
<tr>
<td>9019</td>
<td>FENCE_OPERATION_FAILED</td>
<td>Error</td>
<td>Power management ${Action} of Host ${VdsName} failed.</td>
</tr>
<tr>
<td>9020</td>
<td>FENCE_OPERATION_USING_AGENT_AND_PROXY_STARTED</td>
<td>Info</td>
<td>Executing power management ${Action} on Host ${Host} using Proxy Host ${ProxyHost} and Fence Agent ${AgentType}:${AgentIp}.</td>
</tr>
<tr>
<td>9021</td>
<td>FENCE_OPERATION_USING_AGENT_AND_PROXY_FAILED</td>
<td>Warning</td>
<td>Execution of power management ${Action} on Host ${Host} using Proxy Host ${ProxyHost} and Fence Agent ${AgentType}:${AgentIp} failed.</td>
</tr>
<tr>
<td>9022</td>
<td>ENGINE_NO_FULL_BACKUP</td>
<td>Info</td>
<td>There is no full backup available, please run engine-backup to prevent data loss in case of corruption.</td>
</tr>
<tr>
<td>9023</td>
<td>ENGINE_NO_WARM_BACKUP</td>
<td>Info</td>
<td>Full backup was created on ${Date} and it's too old. Please run engine-backup to prevent data loss in case of corruption.</td>
</tr>
<tr>
<td>9024</td>
<td>ENGINE_BACKUP_STARTED</td>
<td>Normal</td>
<td>Engine backup started.</td>
</tr>
<tr>
<td>9025</td>
<td>ENGINE_BACKUP_COMPLETED</td>
<td>Normal</td>
<td>Engine backup completed successfully.</td>
</tr>
<tr>
<td>9026</td>
<td>ENGINE_BACKUP_FAILED</td>
<td>Error</td>
<td>Engine backup failed.</td>
</tr>
<tr>
<td>9500</td>
<td>TASK_STOPPING_ASYNC_TASK</td>
<td>Info</td>
<td>Stopping async task ${CommandName} that started at ${Date}</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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</tr>
<tr>
<td>9501</td>
<td>TASK_CLEARING_ASYNC_TASK</td>
<td>Info</td>
<td>Clearing asynchronous task ${CommandName} that started at ${Date}</td>
</tr>
<tr>
<td>9506</td>
<td>USER_ACTIVATE_STORAGE_DOMAIN_FAILEDASYNC</td>
<td>Warning</td>
<td>Failed to autorecover Storage Domain ${StorageDomainName} (Data Center ${StoragePoolName}).</td>
</tr>
<tr>
<td>9600</td>
<td>IMPORTEXPORT_IMPORT_VM_INVALID_INTERFACES</td>
<td>Warning</td>
<td>While importing VM ${EntityName}, the Network/s ${Networks} were found to be Non-VM Networks or do not exist in Cluster or are missing a suitable VM network interface profile. Network Name was not set in the Interface/s ${Interfaces}.</td>
</tr>
<tr>
<td>9601</td>
<td>VDS_SET_NON_OPERATIONAL_VM_NETWORK_BRIDGELESS</td>
<td>Warning</td>
<td>Host ${VdsName} does not comply with the cluster ${VdsGroupName} networks, the following VM networks are non-VM networks: '${Networks}'</td>
</tr>
<tr>
<td>9602</td>
<td>HA_VM_FAILED</td>
<td>Error</td>
<td>Highly Available VM ${VmName} failed. It will be restarted automatically.</td>
</tr>
<tr>
<td>9603</td>
<td>HA_VM_RESTART_FAILED</td>
<td>Error</td>
<td>Restart of the Highly Available VM ${VmName} failed.</td>
</tr>
<tr>
<td>9604</td>
<td>EMULATED_MACHINES_IN_COMPATIBLE_WITH_CLUSTER</td>
<td>Warning</td>
<td>Host ${VdsName} does not comply with the cluster ${VdsGroupName} emulated machine. The cluster emulated machine is ${clusterEmulatedMachines} and the host emulated machines are ${hostSupportedEmulatedMachines}.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
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</tr>
<tr>
<td>9605</td>
<td>EXCEEDED_MAXIMUM_NUMBER_OF_RESTART_HA_VM_ATTEMPTS</td>
<td>Error</td>
<td>Highly Available VM ${VmName} could not be restarted automatically, exceeded the maximum number of attempts.</td>
</tr>
<tr>
<td>9606</td>
<td>IMPORTEXPORT_SNAPSHOT_VM_INVALID_INTERFACES</td>
<td>Warning</td>
<td>While previewing a snapshot of VM ${EntityName}, the Network/s ${Networks} were found to be Non-VM Networks or do not exist in Cluster. Network Name was not set in the Interface/s ${Interfaces}.</td>
</tr>
<tr>
<td>9607</td>
<td>ADD_VM_FROM_SNAPSHOT_INVALID_INTERFACES</td>
<td>Warning</td>
<td>While adding vm ${EntityName} from snapshot, the Network/s ${Networks} were found to be Non-VM Networks or do not exist in Cluster. Network Name was not set in the Interface/s ${Interfaces}.</td>
</tr>
<tr>
<td>9608</td>
<td>RNG_SOURCES_INCOMPATIBLE_WITH_CLUSTER</td>
<td>Warning</td>
<td>Host ${VdsName} does not comply with the cluster ${VdsGroupName} Random Number Generator sources. The Hosts supported sources are: ${hostSupportedRngSources}; and the cluster requirements are: ${clusterRequiredRngSources}.</td>
</tr>
<tr>
<td>9609</td>
<td>EMULATED_MACHINES_INCOMPATIBLE_WITH_CLUSTER_LEVEL</td>
<td>Warning</td>
<td>Host ${VdsName} does not comply with the cluster ${VdsGroupName} emulated machines. The current cluster compatibility level supports ${clusterEmulatedMachines} and the host emulated machines are ${hostSupportedEmulatedMachines}.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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</tr>
<tr>
<td>9610</td>
<td>MIXING_RHEL_VERSIONS_IN_Cluster</td>
<td>Warning</td>
<td>Not possible to mix RHEL 6.x and 7.x hosts in one cluster. Tried adding ${addingRhel} host to a cluster with ${previousRhel} hosts.</td>
</tr>
<tr>
<td>9700</td>
<td>DWH_STARTED</td>
<td>Info</td>
<td>ETL Service started.</td>
</tr>
<tr>
<td>9701</td>
<td>DWH_STOPPED</td>
<td>Info</td>
<td>ETL Service stopped.</td>
</tr>
<tr>
<td>9704</td>
<td>DWH_ERROR</td>
<td>Error</td>
<td>Error in ETL Service.</td>
</tr>
<tr>
<td>9801</td>
<td>EXTERNAL_EVENT_NORMAL</td>
<td>Info</td>
<td>An external event with NORMAL severity has been added.</td>
</tr>
<tr>
<td>9802</td>
<td>EXTERNAL_EVENT_WARNING</td>
<td>Warning</td>
<td>An external event with WARNING severity has been added.</td>
</tr>
<tr>
<td>9803</td>
<td>EXTERNAL_EVENT_ERROR</td>
<td>Error</td>
<td>An external event with ERROR severity has been added.</td>
</tr>
<tr>
<td>9804</td>
<td>EXTERNAL_ALERT</td>
<td>Info</td>
<td>An external event with ALERT severity has been added.</td>
</tr>
<tr>
<td>9901</td>
<td>WATCHDOG_EVENT</td>
<td>Warning</td>
<td>Watchdog event (${wdaction}) triggered on ${VmName} at ${wdevent} (host time).</td>
</tr>
<tr>
<td>9910</td>
<td>USER_ADD_CLUSTER_POLICY</td>
<td>Info</td>
<td>Scheduling Policy ${ClusterPolicy} was added. (User: ${UserName})</td>
</tr>
<tr>
<td>9911</td>
<td>USER_FAILED_TO_ADD_CLUSTER_POLICY</td>
<td>Error</td>
<td>Failed to add Scheduling Policy: ${ClusterPolicy}. (User: ${UserName})</td>
</tr>
<tr>
<td>9912</td>
<td>USER_UPDATE_CLUSTER_POLICY</td>
<td>Info</td>
<td>Scheduling Policy ${ClusterPolicy} was updated. (User: ${UserName})</td>
</tr>
<tr>
<td>9913</td>
<td>USER_FAILED_TO_UPDATE_CLUSTER_POLICY</td>
<td>Error</td>
<td>Failed to update Scheduling Policy: ${ClusterPolicy}. (User: ${UserName})</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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</tr>
<tr>
<td>9914</td>
<td>USER_REMOVE_CLUSTER_POLICY</td>
<td>Info</td>
<td>Scheduling Policy ${ClusterPolicy} was removed. (User: ${UserName})</td>
</tr>
<tr>
<td>9915</td>
<td>USER_FAILED_TO_REMOVE_CLUSTER_POLICY</td>
<td>Error</td>
<td>Failed to remove Scheduling Policy: ${ClusterPolicy}. (User: ${UserName})</td>
</tr>
<tr>
<td>9920</td>
<td>FAILED_TO_CONNECT_TO_SCHEDULER_PROXY</td>
<td>Error</td>
<td>Failed to connect to external scheduler proxy. External filters, scoring functions and load balancing will not be performed.</td>
</tr>
<tr>
<td>10000</td>
<td>VDS_UNTRUSTED</td>
<td>Error</td>
<td>Host ${VdsName} was set to non-operational. Host is not trusted by the attestation service.</td>
</tr>
<tr>
<td>10001</td>
<td>USER_UPDATE_VM_FROM_TRUSTED_TO_UNTRUSTED</td>
<td>Warning</td>
<td>The VM ${VmName} was updated from trusted cluster to non-trusted cluster.</td>
</tr>
<tr>
<td>10002</td>
<td>USER_UPDATE_VM_FROM_UNTRUSTED_TO_TRUSTED</td>
<td>Warning</td>
<td>The VM ${VmName} was updated from non-trusted cluster to trusted cluster.</td>
</tr>
<tr>
<td>10003</td>
<td>IMPORTEXPORT_IMPORT_VM_FROM_TRUSTED_TO_UNTRUSTED</td>
<td>Warning</td>
<td>The VM ${VmName} was created in trusted cluster and imported into a non-trusted cluster</td>
</tr>
<tr>
<td>10004</td>
<td>IMPORTEXPORT_IMPORT_VM_FROM_UNTRUSTED_TO_TRUSTED</td>
<td>Warning</td>
<td>The VM ${VmName} was created in non-trusted cluster and imported into a trusted cluster</td>
</tr>
<tr>
<td>10005</td>
<td>USER_ADD_VM_FROM_TRUSTED_TO_UNTRUSTED</td>
<td>Warning</td>
<td>The VM ${VmName} was created in an untrusted cluster. It was originated from the Template ${VmTemplateName} which was created in a trusted cluster.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
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</tr>
<tr>
<td>10006</td>
<td>USER_ADD_VM_FROM_UNTRUSTED_TO_TRUSTED</td>
<td>Warning</td>
<td>The VM ${VmName} was created in a trusted cluster. It was originated from the Template ${VmTemplateName} which was created in an untrusted cluster.</td>
</tr>
<tr>
<td>10007</td>
<td>IMPORTEXPORT_IMPORT_TEMPLATE_FROM_TRUSTED_TO_UNTRUSTED</td>
<td>Warning</td>
<td>The Template ${VmTemplateName} was created in trusted cluster and imported into a non-trusted cluster</td>
</tr>
<tr>
<td>10008</td>
<td>IMPORTEXPORT_IMPORT_TEMPLATE_FROM_UNTRUSTED_TO_TRUSTED</td>
<td>Warning</td>
<td>The Template ${VmTemplateName} was created in non-trusted cluster and imported into a trusted cluster</td>
</tr>
<tr>
<td>10009</td>
<td>USER_ADD_VM_TEMPLATE_FROM_TRUSTED_TO_UNTRUSTED</td>
<td>Warning</td>
<td>The non-trusted Template ${VmTemplateName} was created from trusted Vm ${VmName}.</td>
</tr>
<tr>
<td>10010</td>
<td>USER_ADD_VM_TEMPLATE_FROM_UNTRUSTED_TO_TRUSTED</td>
<td>Warning</td>
<td>The trusted template ${VmTemplateName} was created from non-trusted Vm ${VmName}.</td>
</tr>
<tr>
<td>10011</td>
<td>USER_UPDATE_VM_TEMPLATE_FROM_TRUSTED_TO_UNTRUSTED</td>
<td>Warning</td>
<td>The Template ${VmTemplateName} was updated from trusted cluster to non-trusted cluster.</td>
</tr>
<tr>
<td>10012</td>
<td>USER_UPDATE_VM_TEMPLATE_FROM_UNTRUSTED_TO_TRUSTED</td>
<td>Warning</td>
<td>The Template ${VmTemplateName} was updated from non-trusted cluster to trusted cluster.</td>
</tr>
<tr>
<td>10100</td>
<td>USER_ADDED_NETWORK_QOS</td>
<td>Info</td>
<td>Network QoS ${QosName} was added. (User: ${UserName})</td>
</tr>
<tr>
<td>10101</td>
<td>USER_FAILED_TO_ADD_NETWORK_QOS</td>
<td>Error</td>
<td>Failed to add Network QoS ${QosName}. (User: ${UserName})</td>
</tr>
<tr>
<td>10102</td>
<td>USER_REMOVED_NETWORK_QOS</td>
<td>Info</td>
<td>Network QoS ${QosName} was removed. (User: ${UserName})</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
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</tr>
<tr>
<td>10103</td>
<td>USER_FAILED_TO_REMOV E_NETWORK_QOS</td>
<td>Error</td>
<td>Failed to remove Network QoS ${QosName}. (User: ${UserName})</td>
</tr>
<tr>
<td>10104</td>
<td>USER_UPDATED_NETWORK_QOS</td>
<td>Info</td>
<td>Network QoS ${QosName} was updated. (User: ${UserName})</td>
</tr>
<tr>
<td>10105</td>
<td>USER_FAILED_TO_UPDAT E_NETWORK_QOS</td>
<td>Error</td>
<td>Failed to update Network QoS ${QosName}. (User: ${UserName})</td>
</tr>
<tr>
<td>10110</td>
<td>USER_ADDED_QOS</td>
<td>Info</td>
<td>QoS ${QosName} was added. (User: ${UserName})</td>
</tr>
<tr>
<td>10111</td>
<td>USER_FAILED_TO_ADD_Q OS</td>
<td>Error</td>
<td>Failed to add QoS ${QosName}. (User: ${UserName})</td>
</tr>
<tr>
<td>10112</td>
<td>USER_REMOVED_QOS</td>
<td>Info</td>
<td>QoS ${QosName} was removed. (User: ${UserName})</td>
</tr>
<tr>
<td>10113</td>
<td>USER_FAILED_TO_REMOV E_QOS</td>
<td>Error</td>
<td>Failed to remove QoS ${QosName}. (User: ${UserName})</td>
</tr>
<tr>
<td>10114</td>
<td>USER_UPDATED_QOS</td>
<td>Info</td>
<td>QoS ${QosName} was updated. (User: ${UserName})</td>
</tr>
<tr>
<td>10115</td>
<td>USER_FAILED_TO_UPDAT E_QOS</td>
<td>Error</td>
<td>Failed to update QoS ${QosName}. (User: ${UserName})</td>
</tr>
<tr>
<td>10120</td>
<td>USER_ADDED_DISK_PROF ILE</td>
<td>Info</td>
<td>Disk Profile ${ProfileName} was successfully added (User: ${UserName}).</td>
</tr>
<tr>
<td>10121</td>
<td>USER_FAILED_TO_ADD_DISK_PROFILE</td>
<td>Error</td>
<td>Failed to add Disk Profile (User: ${UserName}).</td>
</tr>
<tr>
<td>10122</td>
<td>USER_REMOVED_DISK_PROFILE</td>
<td>Info</td>
<td>Disk Profile ${ProfileName} was successfully removed (User: ${UserName}).</td>
</tr>
<tr>
<td>10123</td>
<td>USER_FAILED_TO_REMOV E_DISK_PROFILE</td>
<td>Error</td>
<td>Failed to remove Disk Profile ${ProfileName} (User: ${UserName}).</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
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</tr>
<tr>
<td>10124</td>
<td>USER_UPDATED_DISK_PROFILE</td>
<td>Info</td>
<td>Disk Profile ${ProfileName} was successfully updated (User: ${UserName}).</td>
</tr>
<tr>
<td>10125</td>
<td>USER_FAILED_TO_UPDATE_DISK_PROFILE</td>
<td>Error</td>
<td>Failed to update Disk Profile ${ProfileName} (User: ${UserName}).</td>
</tr>
<tr>
<td>10130</td>
<td>USER_ADDED_CPU_PROFILE</td>
<td>Info</td>
<td>CPU Profile ${ProfileName} was successfully added (User: ${UserName}).</td>
</tr>
<tr>
<td>10131</td>
<td>USER_FAILED_TO_ADD_CPU_PROFILE</td>
<td>Error</td>
<td>Failed to add CPU Profile (User: ${UserName}).</td>
</tr>
<tr>
<td>10132</td>
<td>USER_REMOVED_CPU_PROFILE</td>
<td>Info</td>
<td>CPU Profile ${ProfileName} was successfully removed (User: ${UserName}).</td>
</tr>
<tr>
<td>10133</td>
<td>USER_FAILED_TO_REMOVE_CPU_PROFILE</td>
<td>Error</td>
<td>Failed to remove CPU Profile ${ProfileName} (User: ${UserName}).</td>
</tr>
<tr>
<td>10134</td>
<td>USER_UPDATED_CPU_PROFILE</td>
<td>Info</td>
<td>CPU Profile ${ProfileName} was successfully updated (User: ${UserName}).</td>
</tr>
<tr>
<td>10135</td>
<td>USER_FAILED_TO_UPDATE_CPU_PROFILE</td>
<td>Error</td>
<td>Failed to update CPU Profile ${ProfileName} (User: ${UserName}).</td>
</tr>
<tr>
<td>10200</td>
<td>USER_UPDATED_MOM_POLICIES</td>
<td>Info</td>
<td>Mom policy was updated on host ${VdsName}.</td>
</tr>
<tr>
<td>10201</td>
<td>USER_FAILED_TO_UPDATE_MOM_POLICIES</td>
<td>Warning</td>
<td>Mom policy could not be updated on host ${VdsName}.</td>
</tr>
<tr>
<td>10250</td>
<td>PM_POLICY_UP_TO_MAINTENANCE</td>
<td>Info</td>
<td>Host ${Host} is not currently needed, activating maintenance mode in preparation for shutdown.</td>
</tr>
<tr>
<td>10251</td>
<td>PM_POLICY_MAINTENANCE_TO_DOWN</td>
<td>Info</td>
<td>Host ${Host} is not currently needed, shutting down.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
<td>----------</td>
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<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>10252</td>
<td>PM_POLICY_TO_UP</td>
<td>Info</td>
<td>Reactivating host ${Host} according to the current power management policy.</td>
</tr>
<tr>
<td>10300</td>
<td>CLUSTER_ALERT_HA_RESERVATION</td>
<td>Info</td>
<td>Cluster ${ClusterName} failed the HA Reservation check, HA VMs on host(s): ${Hosts} will fail to migrate in case of a failover, consider adding resources or shutting down unused VMs.</td>
</tr>
<tr>
<td>10301</td>
<td>CLUSTER_ALERT_HA_RESERVATION_DOWN</td>
<td>Info</td>
<td>Cluster ${ClusterName} passed the HA Reservation check.</td>
</tr>
<tr>
<td>10350</td>
<td>USER_ADDED_AFFINITY_GROUP</td>
<td>Info</td>
<td>Affinity Group ${affinityGroupName} was added. (User: ${UserName})</td>
</tr>
<tr>
<td>10351</td>
<td>USER_FAILED_TO_ADD_AFFINITY_GROUP</td>
<td>Error</td>
<td>Failed to add Affinity Group ${affinityGroupName}. (User: ${UserName})</td>
</tr>
<tr>
<td>10352</td>
<td>USER_UPDATED_AFFINITY_GROUP</td>
<td>Info</td>
<td>Affinity Group ${affinityGroupName} was updated. (User: ${UserName})</td>
</tr>
<tr>
<td>10353</td>
<td>USER_FAILED_TO_UPDATE_AFFINITY_GROUP</td>
<td>Error</td>
<td>Failed to update Affinity Group ${affinityGroupName}. (User: ${UserName})</td>
</tr>
<tr>
<td>10354</td>
<td>USER_REMOVED_AFFINITY_GROUP</td>
<td>Info</td>
<td>Affinity Group ${affinityGroupName} was removed. (User: ${UserName})</td>
</tr>
<tr>
<td>10355</td>
<td>USER_FAILED_TO_REMOVE_AFFINITY_GROUP</td>
<td>Error</td>
<td>Failed to remove Affinity Group ${affinityGroupName}. (User: ${UserName})</td>
</tr>
<tr>
<td>10400</td>
<td>ISCSI_BOND_ADD_SUCCESS</td>
<td>Info</td>
<td>iSCSI bond '${IscsiBondName}' was successfully created in Data Center '${StoragePoolName}'.</td>
</tr>
<tr>
<td>10401</td>
<td>ISCSI_BOND_ADD_FAILED</td>
<td>Error</td>
<td>Failed to create iSCSI bond '${IscsiBondName}' in Data Center '${StoragePoolName}'.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
<td>------------</td>
<td>-------------------------------------------</td>
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<td>--------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>10402</td>
<td>ISCSI_BOND_EDIT_SUCCEED</td>
<td>Info</td>
<td>iSCSI bond '${IscsiBondName}' was successfully updated.</td>
</tr>
<tr>
<td>10403</td>
<td>ISCSI_BOND_EDIT_FAILED</td>
<td>Error</td>
<td>Failed to update iSCSI bond '${IscsiBondName}'.</td>
</tr>
<tr>
<td>10404</td>
<td>ISCSI_BOND_REMOVE_SUCCESS</td>
<td>Info</td>
<td>iSCSI bond '${IscsiBondName}' was removed from Data Center '${StoragePoolName}'.</td>
</tr>
<tr>
<td>10405</td>
<td>ISCSI_BOND_REMOVE_FAILED</td>
<td>Error</td>
<td>Failed to remove iSCSI bond '${IscsiBondName}' from Data Center '${StoragePoolName}'.</td>
</tr>
<tr>
<td>10406</td>
<td>ISCSI_BOND_EDIT_SUCCEED_WITH_WARNING</td>
<td>Warning</td>
<td>iSCSI bond '${IscsiBondName}' was successfully updated but some of the hosts encountered connection issues.</td>
</tr>
<tr>
<td>10407</td>
<td>ISCSI_BOND_ADD_SUCCESS_WITH_WARNING</td>
<td>Warning</td>
<td>iSCSI bond '${IscsiBondName}' was successfully created in Data Center '${StoragePoolName}' but some of the hosts encountered connection issues.</td>
</tr>
<tr>
<td>10450</td>
<td>USER_SET_HOSTED_ENGINEMAINTENANCE</td>
<td>Info</td>
<td>Hosted Engine HA maintenance mode was updated on host '${VdsName}'.</td>
</tr>
<tr>
<td>10451</td>
<td>USER_FAILED_TO_SET_HOSTED_ENGINE_MAINTENANCE</td>
<td>Error</td>
<td>Hosted Engine HA maintenance mode could not be updated on host '${VdsName}'.</td>
</tr>
<tr>
<td>10452</td>
<td>VDS_MAINTENANCE_MANUAL_HA</td>
<td>Warning</td>
<td>Host '${VdsName}' was switched to Maintenance mode, but Hosted Engine HA maintenance could not be enabled. Please enable it manually.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------------------------------</td>
<td>----------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>10453</td>
<td>USER_VDS_MAINTENANCE_MANUAL_HA</td>
<td>Warning</td>
<td>Host <code>${VdsName}</code> was switched to Maintenance mode by <code>${UserName}</code>, but Hosted Engine HA maintenance could not be enabled. Please enable it manually.</td>
</tr>
<tr>
<td>10454</td>
<td>VDS_ACTIVATE_MANUAL_HA</td>
<td>Warning</td>
<td>Host <code>${VdsName}</code> was activated by <code>${UserName}</code>, but the Hosted Engine HA service may still be in maintenance mode. If necessary, please correct this manually.</td>
</tr>
<tr>
<td>10455</td>
<td>VDS_ACTIVATE_MANUAL_HA_ASYNC</td>
<td>Warning</td>
<td>Host <code>${VdsName}</code> was autorecovered, but the Hosted Engine HA service may still be in maintenance mode. If necessary, please correct this manually.</td>
</tr>
<tr>
<td>10456</td>
<td>HOSTED_ENGINE_VM_IMPORT_SUCCEEDED</td>
<td>Normal</td>
<td>Hosted Engine VM was imported successfully</td>
</tr>
<tr>
<td>10460</td>
<td>HOSTED_ENGINE_DOMAIN_IMPORT_SUCCEEDED</td>
<td>Normal</td>
<td>Hosted Engine storage domain imported successfully</td>
</tr>
<tr>
<td>10461</td>
<td>HOSTED_ENGINE_DOMAIN_IMPORT_FAILED</td>
<td>Error</td>
<td>Failed to import the Hosted Engine Storage Domain</td>
</tr>
<tr>
<td>10500</td>
<td>EXTERNAL_SCHEDULER_PLUGIN_ERROR</td>
<td>Error</td>
<td>Running the external scheduler plugin '${PluginName}' failed: '${ErrorMessage}'</td>
</tr>
<tr>
<td>10501</td>
<td>EXTERNAL_SCHEDULER_ERROR</td>
<td>Error</td>
<td>Running the external scheduler failed: '${ErrorMessage}'</td>
</tr>
<tr>
<td>10550</td>
<td>VM_SLA_POLICY</td>
<td>Info</td>
<td>VM <code>${VmName}</code> SLA Policy was set. CPU limit is set to <code>${cpuLimit}</code></td>
</tr>
<tr>
<td>10551</td>
<td>FAILED_VM_SLA_POLICY</td>
<td>Error</td>
<td>Failed to set SLA Policy to VM <code>${VmName}</code>. Underlying error message: <code>${ErrorMessage}</code></td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
<td>----------</td>
<td>-------------------------------------</td>
<td>----------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>10600</td>
<td>USER_REMOVE_AUDIT_LOG</td>
<td>Info</td>
<td>Event list message ${AuditLogId} was removed by User ${UserName}.</td>
</tr>
<tr>
<td>10601</td>
<td>USER_REMOVE_AUDIT_LOG_FAILED</td>
<td>Error</td>
<td>User ${UserName} failed to remove event list message ${AuditLogId}.</td>
</tr>
<tr>
<td>10602</td>
<td>USER_CLEAR_ALL_AUDIT_LOG</td>
<td>Info</td>
<td></td>
</tr>
<tr>
<td>10603</td>
<td>USER_CLEAR_ALL_AUDIT_LOG_FAILED</td>
<td>Error</td>
<td></td>
</tr>
<tr>
<td>10604</td>
<td>USER_DISPLAY_ALL_AUDIT_LOG</td>
<td>Info</td>
<td></td>
</tr>
<tr>
<td>10605</td>
<td>USER_DISPLAY_ALL_AUDIT_LOG_FAILED</td>
<td>Error</td>
<td></td>
</tr>
<tr>
<td>10700</td>
<td>MAC_POOL_ADD_SUCCESS</td>
<td>Info</td>
<td>MAC Pool '{MacPoolName}' (id</td>
</tr>
<tr>
<td>10701</td>
<td>MAC_POOL_ADD_FAILED</td>
<td>Error</td>
<td>Failed to create MAC Pool '{MacPoolName}'. (User: ${UserName})</td>
</tr>
<tr>
<td>10702</td>
<td>MAC_POOL_EDIT_SUCCESS</td>
<td>Info</td>
<td>MAC Pool '{MacPoolName}' (id</td>
</tr>
<tr>
<td>10703</td>
<td>MAC_POOL_EDIT_FAILED</td>
<td>Error</td>
<td>Failed to update MAC Pool '{MacPoolName}' (id</td>
</tr>
<tr>
<td>10704</td>
<td>MAC_POOL_REMOVE_SUCCESS</td>
<td>Info</td>
<td>MAC Pool '{MacPoolName}' (id</td>
</tr>
<tr>
<td>10705</td>
<td>MAC_POOL_REMOVE_FAILED</td>
<td>Error</td>
<td>Failed to remove MAC Pool '{MacPoolName}' (id</td>
</tr>
<tr>
<td>10750</td>
<td>CINDER_PROVIDER_ERROR</td>
<td>Error</td>
<td>An error occurred on Cinder provider: '${CinderException}'</td>
</tr>
<tr>
<td>10751</td>
<td>CINDER_DISK_CONNECTION_FAILURE</td>
<td>Error</td>
<td>Failed to retrieve connection information for Cinder Disk '{DiskAlias}'.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
<td>--------</td>
<td>-------------------------------------------------------</td>
<td>------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>10752</td>
<td>CINDER_DISK_CONNECTION_VOLUME_DRIVER_UNSUPPORTED</td>
<td>Error</td>
<td>Unsupported volume driver for Cinder Disk '${DiskAlias}'.</td>
</tr>
<tr>
<td>10753</td>
<td>USER_FINISHED_FAILED_REMOVE_CINDER_DISK</td>
<td>Error</td>
<td>Failed to remove disk '${DiskAlias}' from storage domain '${StorageDomainName}'. The following entity id could not be deleted from the Cinder provider '${imageId}'. (User: '${UserName}').</td>
</tr>
<tr>
<td>10754</td>
<td>USER_ADDED_LIBVIRT_SECRET</td>
<td>Info</td>
<td>Authentication Key '${LibvirtSecretUUID}' was added. (User: '${UserName}').</td>
</tr>
<tr>
<td>10755</td>
<td>USER_FAILED_TO_ADD_LIBVIRT_SECRET</td>
<td>Error</td>
<td>Failed to add Authentication Key '${LibvirtSecretUUID}'. (User: '${UserName}').</td>
</tr>
<tr>
<td>10756</td>
<td>USER_UPDATE_LIBVIRT_SECRET</td>
<td>Info</td>
<td>Authentication Key '${LibvirtSecretUUID}' was updated. (User: '${UserName}').</td>
</tr>
<tr>
<td>10757</td>
<td>USER_FAILED_TO_UPDATE_LIBVIRT_SECRET</td>
<td>Error</td>
<td>Failed to update Authentication Key '${LibvirtSecretUUID}'. (User: '${UserName}').</td>
</tr>
<tr>
<td>10758</td>
<td>USER_REMOVED_LIBVIRT_SECRET</td>
<td>Info</td>
<td>Authentication Key '${LibvirtSecretUUID}' was removed. (User: '${UserName}').</td>
</tr>
<tr>
<td>10759</td>
<td>USER_FAILED_TO_REMOVE_LIBVIRT_SECRET</td>
<td>Error</td>
<td>Failed to remove Authentication Key '${LibvirtSecretUUID}'. (User: '${UserName}').</td>
</tr>
<tr>
<td>10760</td>
<td>FAILED_TO_REGISTER_LIBVIRT_SECRET</td>
<td>Error</td>
<td>Failed to register Authentication Keys for storage domain '${StorageDomainName}' on host '${VdsName}'.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
<td>--------</td>
<td>------------------------------------------------</td>
<td>----------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>10761</td>
<td>FAILED_TO_UNREGISTER_LIBVIRT_SECRET</td>
<td>Error</td>
<td>Failed to unregister Authentication Keys for storage domain (\text{${StorageDomainName}}) on host (\text{${VdsName}}).</td>
</tr>
<tr>
<td>10762</td>
<td>FAILED_TO_REGISTER_LIBVIRT_SECRET_ON_VDS</td>
<td>Error</td>
<td>Failed to register Authentication Keys on host (\text{${VdsName}}).</td>
</tr>
<tr>
<td>10763</td>
<td>NO_LIBRBD_PACKAGE_AVAILABLE_ON_VDS</td>
<td>Error</td>
<td>Librbd1 package is not available on host (\text{${VdsName}}), which is mandatory for using Cinder storage domains.</td>
</tr>
<tr>
<td>10764</td>
<td>FAILED_TO_FREEZE_VM</td>
<td>Warning</td>
<td>Failed to freeze guest filesystems on VM (\text{${VmName}}). Note that using the created snapshot might cause data inconsistency.</td>
</tr>
<tr>
<td>10765</td>
<td>FAILED_TO_THAW_VM</td>
<td>Warning</td>
<td>Failed to thaw guest filesystems on VM (\text{${VmName}}). The filesystems might be unresponsive until the VM is restarted.</td>
</tr>
<tr>
<td>10766</td>
<td>FREEZE_VM_INITIATED</td>
<td>Normal</td>
<td>Freeze of guest filesystems on VM (\text{${VmName}}) was initiated.</td>
</tr>
<tr>
<td>10767</td>
<td>FREEZE_VM_SUCCESS</td>
<td>Normal</td>
<td>Guest filesystems on VM (\text{${VmName}}) have been frozen successfully.</td>
</tr>
<tr>
<td>10768</td>
<td>THAW_VM_SUCCESS</td>
<td>Normal</td>
<td>Guest filesystems on VM (\text{${VmName}}) have been thawed successfully.</td>
</tr>
<tr>
<td>10769</td>
<td>USER_FAILED_TO_FREEZE_VM</td>
<td>Warning</td>
<td>Failed to freeze guest filesystems on (\text{${VmName}}) (Host: (\text{${VdsName}}), User: (\text{${UserName}})).</td>
</tr>
<tr>
<td>10770</td>
<td>USER_FAILED_TO_THAW_VM</td>
<td>Warning</td>
<td>Failed to thaw guest filesystems on (\text{${VmName}}) (Host: (\text{${VdsName}}), User: (\text{${UserName}})).</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
<td>--------</td>
<td>----------------------------------------------------------------------</td>
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<td>-------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>10771</td>
<td>VDS_CANNOT_CONNECT_TO_GLUSTERFS</td>
<td>Error</td>
<td>Host ${VdsName} cannot connect to Glusterfs. Verify that glusterfs-cli package is installed on the host.</td>
</tr>
<tr>
<td>10780</td>
<td>AFFINITY_RULES_ENFORCEMENT_MANAGER_START</td>
<td>Normal</td>
<td>Affinity Rules Enforcement Manager started.</td>
</tr>
<tr>
<td>10781</td>
<td>AFFINITY_RULES_ENFORCEMENT_MANAGER_INTERVAL_REACHED</td>
<td>Normal</td>
<td></td>
</tr>
<tr>
<td>10800</td>
<td>VM_ADD_HOST_DEVICES</td>
<td>Info</td>
<td>Host devices ${NamesAdded} were attached to Vm ${VmName} by User ${UserName}.</td>
</tr>
<tr>
<td>10801</td>
<td>VM_REMOVE_HOST_DEVICES</td>
<td>Info</td>
<td>Host devices ${NamesRemoved} were detached from Vm ${VmName} by User ${UserName}.</td>
</tr>
<tr>
<td>10802</td>
<td>VDS_BROKER_COMMAND_FAILURE</td>
<td>Error</td>
<td>VDSM ${VdsName} command failed: ${message}</td>
</tr>
<tr>
<td>10803</td>
<td>IRS_BROKER_COMMAND_FAILURE</td>
<td>Error</td>
<td>VDSM command failed: ${message}</td>
</tr>
<tr>
<td>10804</td>
<td>VDS_UNKNOWN_HOST</td>
<td>Error</td>
<td>The address of host ${VdsName} could not be determined</td>
</tr>
<tr>
<td>10810</td>
<td>SYSTEM_CHANGE_STORAGE_POOL_STATUS_UP_REPORTING_HOSTS</td>
<td>Normal</td>
<td>Data Center ${StoragePoolName} status was changed to UP as some of its hosts are in status UP.</td>
</tr>
<tr>
<td>10811</td>
<td>SYSTEM_CHANGE_STORAGE_POOL_STATUS_NON_RESPONSIVE_NO_REPORTING_HOSTS</td>
<td>Info</td>
<td>Data Center ${StoragePoolName} status was changed to Non Responsive as none of its hosts are in status UP.</td>
</tr>
<tr>
<td>10900</td>
<td>HOST_SYNC_ALL_NETWORKS_FAILED</td>
<td>Error</td>
<td>Failed to sync all host ${VdsName} networks</td>
</tr>
<tr>
<td>10901</td>
<td>HOST_SYNC_ALL_NETWORKS_FINISHED</td>
<td>Info</td>
<td>Managed to sync all host ${VdsName} networks.</td>
</tr>
<tr>
<td>Code</td>
<td>Name</td>
<td>Severity</td>
<td>Message</td>
</tr>
<tr>
<td>---------</td>
<td>-------------------------------------------</td>
<td>----------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>10902</td>
<td>PERSIST_HOST_SETUP_NETWORK_ON_HOST</td>
<td>Info</td>
<td>${Sequence}/${Total}): Applying network's changes on host ${VdsName}. (User: ${UserName})</td>
</tr>
<tr>
<td>10903</td>
<td>PERSIST_SETUP_NETWORK_ON_HOST_FINISHED</td>
<td>Info</td>
<td>${Sequence}/${Total}): Successfully applied changes on host ${VdsName}. (User: ${UserName})</td>
</tr>
<tr>
<td>10904</td>
<td>PERSIST_SETUP_NETWORK_ON_HOST_FAILED</td>
<td>Error</td>
<td>${Sequence}/${Total}): Failed to apply changes on host ${VdsName}. (User: ${UserName})</td>
</tr>
<tr>
<td>11000</td>
<td>USER_ADD_EXTERNAL_JOB</td>
<td>Info</td>
<td>New external Job ${description} was added by user ${UserName}</td>
</tr>
<tr>
<td>11001</td>
<td>USER_ADD_EXTERNAL_JOB_FAILED</td>
<td>Error</td>
<td>Failed to add new external Job ${description}</td>
</tr>
</tbody>
</table>
APPENDIX D. TIMEZONES

D.1. TIMEZONES

The API maps Windows Standard Format timezone names to tz database format when specifying a timezone for a virtual machine or VM template. This means the API only accepts certain tz database codes, which the following table lists:

Table D.1. Accepted tz database codes

<table>
<thead>
<tr>
<th>tz database Format</th>
<th>Windows Standard Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa/Cairo</td>
<td>Egypt Standard Time</td>
</tr>
<tr>
<td>Africa/Casablanca</td>
<td>Morocco Standard Time</td>
</tr>
<tr>
<td>Africa/Johannesburg</td>
<td>South Africa Standard Time</td>
</tr>
<tr>
<td>Africa/Lagos</td>
<td>W. Central Africa Standard Time</td>
</tr>
<tr>
<td>Africa/Nairobi</td>
<td>E. Africa Standard Time</td>
</tr>
<tr>
<td>Africa/Reykjavik</td>
<td>Greenwich Standard Time</td>
</tr>
<tr>
<td>Africa/Windhoek</td>
<td>Namibia Standard Time</td>
</tr>
<tr>
<td>America/Anchorage</td>
<td>Alaskan Standard Time</td>
</tr>
<tr>
<td>America/Bogota</td>
<td>SA Pacific Standard Time</td>
</tr>
<tr>
<td>America/Buenos_Aires</td>
<td>Argentina Standard Time</td>
</tr>
<tr>
<td>America/Caracas</td>
<td>Venezuela Standard Time</td>
</tr>
<tr>
<td>America/Chicago</td>
<td>Central Standard Time</td>
</tr>
<tr>
<td>America/Chihuahua</td>
<td>Mexico Standard Time</td>
</tr>
<tr>
<td>America/Chihuahua</td>
<td>Mountain Standard Time</td>
</tr>
<tr>
<td>America/Denver</td>
<td>Mountain Standard Time</td>
</tr>
<tr>
<td>America/Godthab</td>
<td>Greenland Standard Time</td>
</tr>
<tr>
<td>America/Guatemala</td>
<td>Central America Standard Time</td>
</tr>
<tr>
<td>America/Halifax</td>
<td>Atlantic Standard Time</td>
</tr>
<tr>
<td>tz database Format</td>
<td>Windows Standard Format</td>
</tr>
<tr>
<td>-------------------------</td>
<td>------------------------------------------</td>
</tr>
<tr>
<td>America/La_Paz</td>
<td>SA Western Standard Time</td>
</tr>
<tr>
<td>America/Los_Angeles</td>
<td>Pacific Standard Time</td>
</tr>
<tr>
<td>America/Manaus</td>
<td>Central Brazilian Standard Time</td>
</tr>
<tr>
<td>America/Mexico_City</td>
<td>Central Standard Time</td>
</tr>
<tr>
<td>America/Mexico_City</td>
<td>Mexico Standard Time</td>
</tr>
<tr>
<td>America/Montevideo</td>
<td>Montevideo Standard Time</td>
</tr>
<tr>
<td>America/New_York</td>
<td>Eastern Standard Time</td>
</tr>
<tr>
<td>America/Phoenix</td>
<td>US Mountain Standard Time</td>
</tr>
<tr>
<td>America/Regina</td>
<td>Canada Central Standard Time</td>
</tr>
<tr>
<td>America/Santiago</td>
<td>Pacific SA Standard Time</td>
</tr>
<tr>
<td>America/Sao_Paulo</td>
<td>E. South America Standard Time</td>
</tr>
<tr>
<td>America/St_Johns</td>
<td>Newfoundland Standard Time</td>
</tr>
<tr>
<td>America/Tijuana</td>
<td>Pacific Standard Time</td>
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APPENDIX E. REVISION HISTORY

Revision 3.6-13  Wed 14 Dec 2016  Red Hat Enterprise Virtualization Documentation Team

BZ#1377738 - Updated Hot plugging vCPUs example.

Revision 3.6-12  Thur 07 Apr 2016  Red Hat Enterprise Virtualization Documentation Team

BZ#1302539 - Added a section about MAC address pools.
BZ#1302712 - Added instructions for refreshing LUN size.
BZ#1213803 - Added instructions for importing iSCSI or FCP block storage.

Revision 3.6-11  Wed 9 Mar 2016  Red Hat Enterprise Virtualization Documentation Team

BZ#1285925 - Added content for freezing and thawing guest filesystems, which is required for taking snapshots of virtual machines with OpenStack Volume (Cinder) disks.

Revision 3.6-10  Tue 1 Mar 2016  Red Hat Enterprise Virtualization Documentation Team

BZ#1304924 - Added instructions for defining iSCSI credentials per host.
BZ#1149441 - Updated the Host Networking API.

Revision 3.6-9  Mon 22 Feb 2016  Red Hat Enterprise Virtualization Documentation Team

Initial revision for Red Hat Enterprise Virtualization 3.6 general availability.

Revision 3.6-8  Fri 19 Feb 2016  Red Hat Enterprise Virtualization Documentation Team

BZ#1309152 - Added information about hot plugging vCPUs.

Revision 3.6-7  Mon 8 Feb 2016  Red Hat Enterprise Virtualization Documentation Team

BZ#1285344 - Added information regarding external health status of hosts and storage domains.
BZ#1252755 - Added instructions for copying a virtual disk.
BZ#1285345 - Added multi-host pinning information.
BZ#1124128 - Added NUMA content to the guide.

Revision 3.6-6  Fri 15 Jan 2016  Red Hat Enterprise Virtualization Documentation Team

BZ#1281667 - Added severity levels and error messages to the table that lists event codes.

Revision 3.6-5  Thu 14 Jan 2016  Red Hat Enterprise Virtualization Documentation Team

BZ#1284288 - Changed references to the 'rhevm' management network to 'ovirtmgmt'.

Revision 3.6-4  Wed 23 Dec 2015  Red Hat Enterprise Virtualization Documentation Team

BZ#1194228 - Added information about the All-Content header.

Revision 3.6-3  Wed 18 Nov 2015  Red Hat Enterprise Virtualization Documentation Team

Final revision for Red Hat Enterprise Virtualization 3.6 beta.

Revision 3.6-2  Wed 18 Nov 2015  Red Hat Enterprise Virtualization Documentation Team
**BZ#1255281** - Added details about how to hot plug memory into virtual machines.

**BZ#1255229** - Updated the power management REST API example.

**BZ#1250784** - Added instructions for specifying default 'wipe after delete' behavior on storage domains.

**BZ#1278783** - Updated the examples for creating and updating a virtual machine pool.

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<td>Mon 10 Aug 2015</td>
<td>Initial creation for the Red Hat Enterprise Virtualization 3.6 release.</td>
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**Red Hat Enterprise Virtualization Documentation Team**