



vOperations Suite™
API User's Guide

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1 General

The VOperations Suite API utilizes Representational State Transfer (REST) with the HTTP Get method for all requests.

The **Enable API** checkbox in **Settings > General > Miscellaneous** must be checked to access the API.

2 Object Discovery

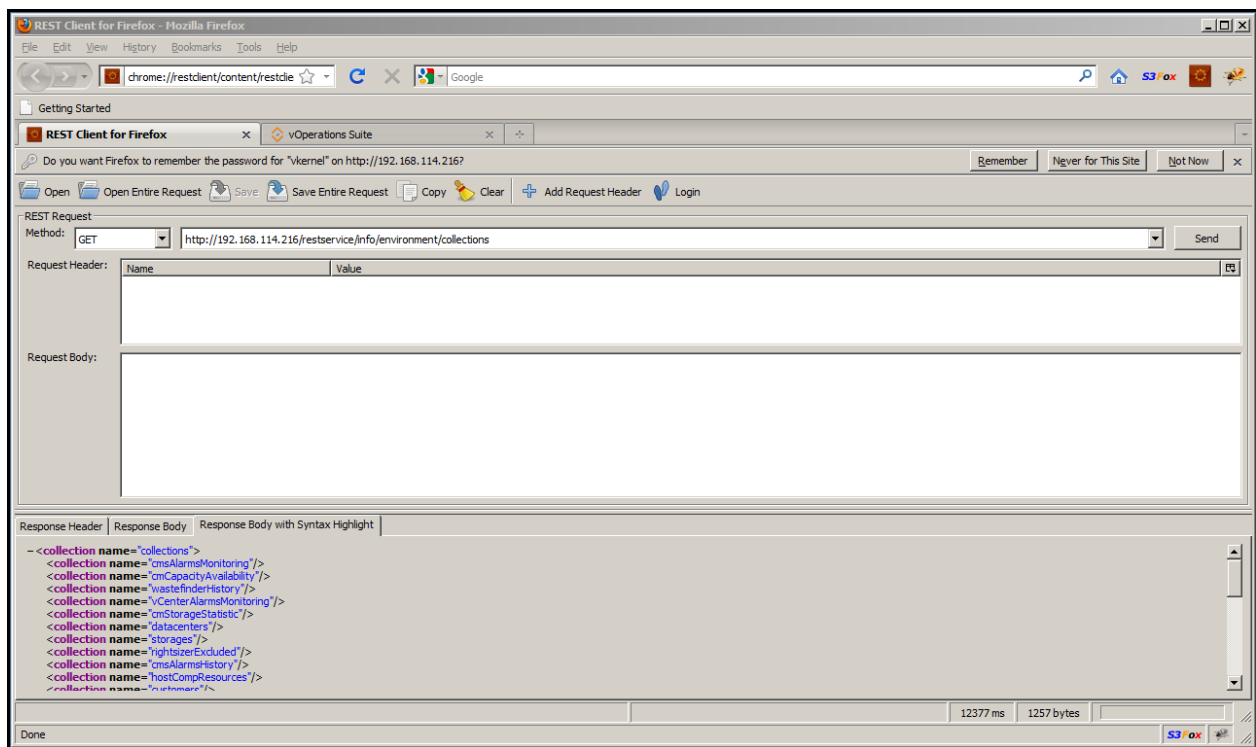
The API is structured so that the user can easily determine what objects are available. Use the following HTTP **Get** URL to retrieve a list of the next level objects supported by a particular object type.

http://{ appliance url }/restservice/info/{object name}/collections

All supported objects can be identified by starting with the **environment** object name.

2.1 Environment Object Discovery Example

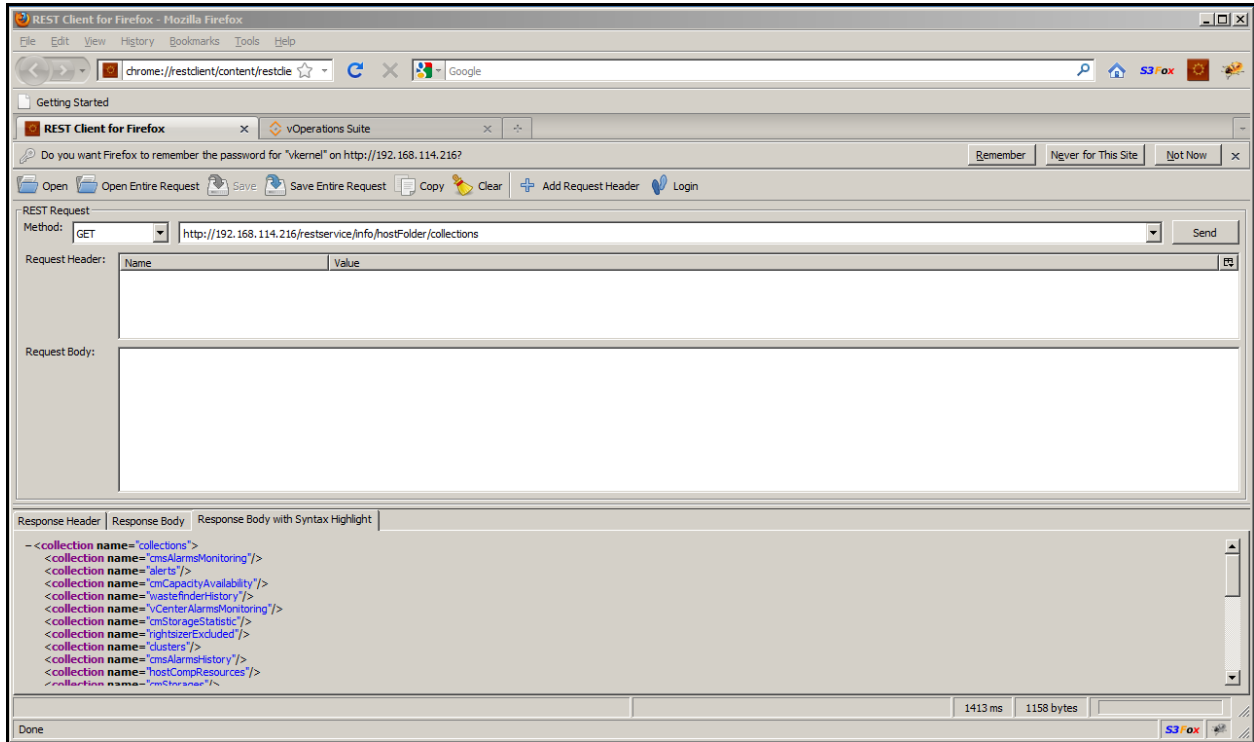
The following example (using the Rest Client Firefox Plug-In) shows the next level of objects available under the **environment** object.



Each of the retrieved objects can then be queried to determine what next level of objects (if any) they support.

2.2 General Container Object Discovery Example

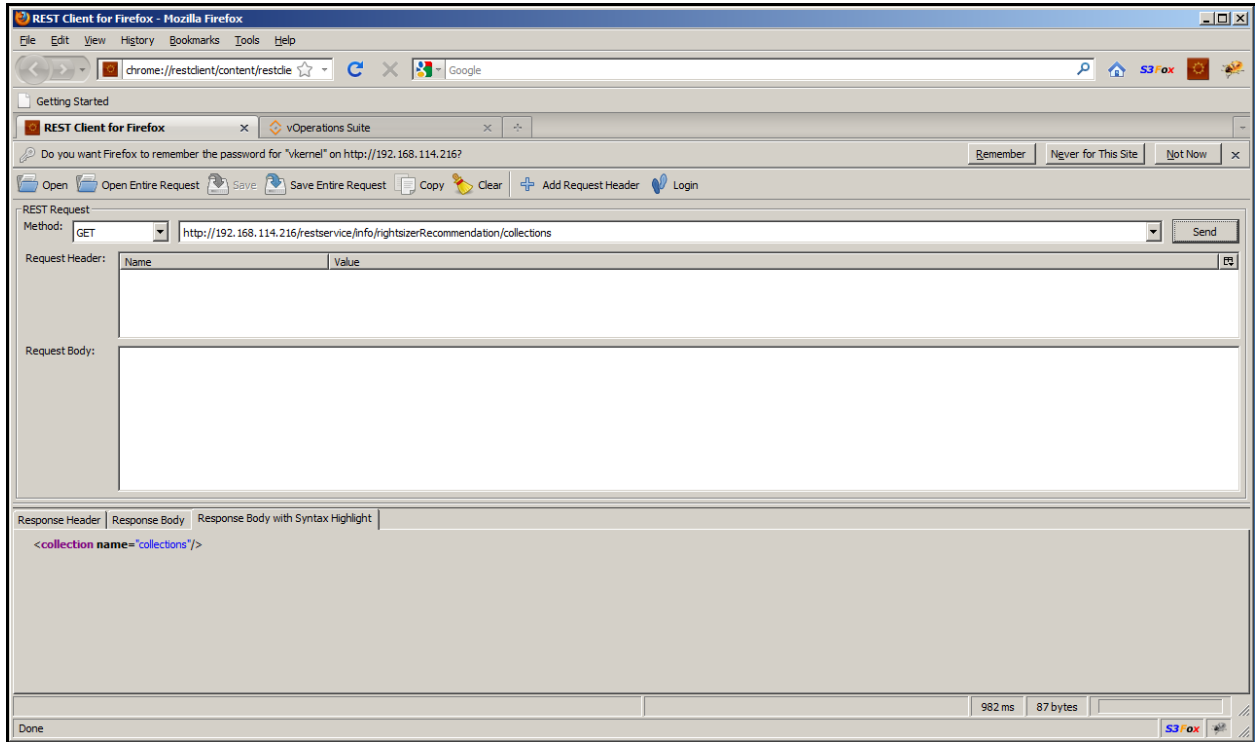
The following example shows the next level of objects available under the **hostFolders** container object. Please note that the trailing "s" must be removed from the object name.



Each of the retrieved objects can then be queried to determine what objects (if any) are supported.

2.3 Non-Container Object Discovery Example

Non-Container objects do not have a next level of objects. The following example shows the data returned for the **rightsizerRecommendations** object. Please note that the trailing "s" must be removed from the object name.



3 Infrastructure Object Access

All of the infrastructure container and non-container objects may be accessed.

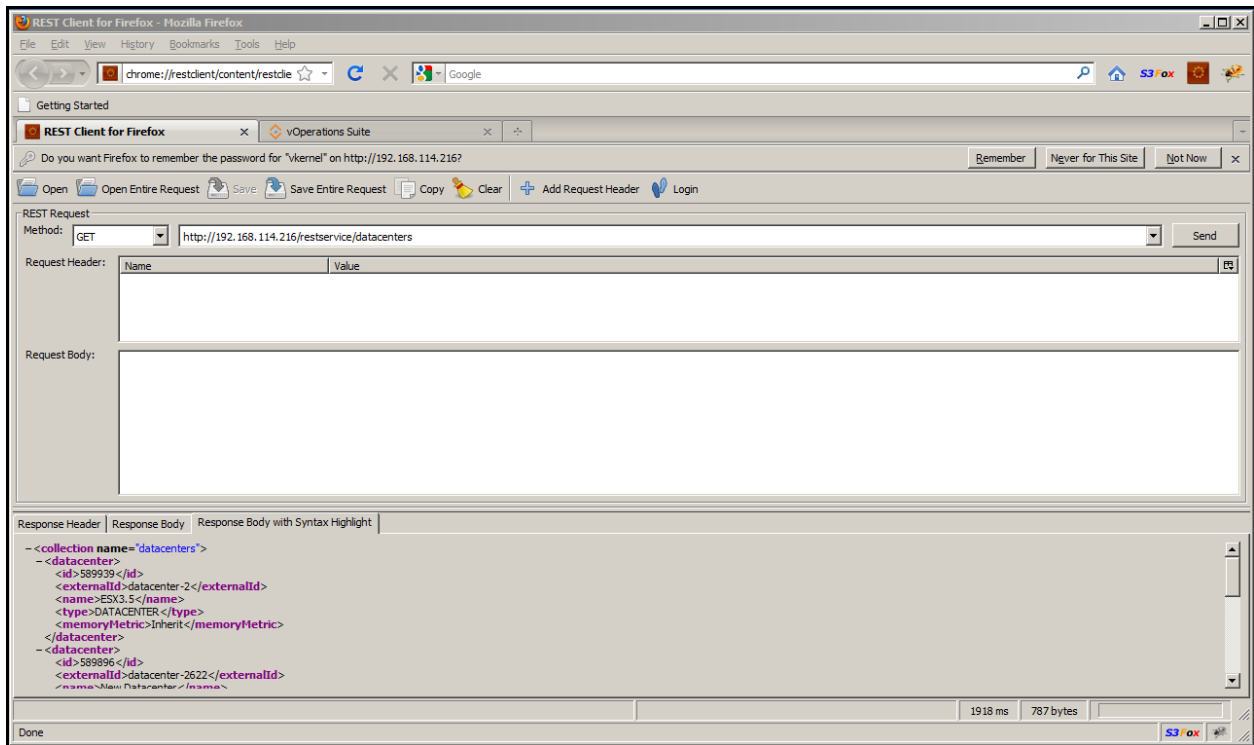
3.1 Root Infrastructure Object Access Example

Use the following HTTP **Get** URL to access a list of all of the actual objects at the root container level.

http://{ appliance url }/restservice/{ root object name}

The root container objects are: connections, environment/customers, environment/businessViews and environment/dcFolders.

The following example shows all of the actual objects available under the **datacenters** root container.



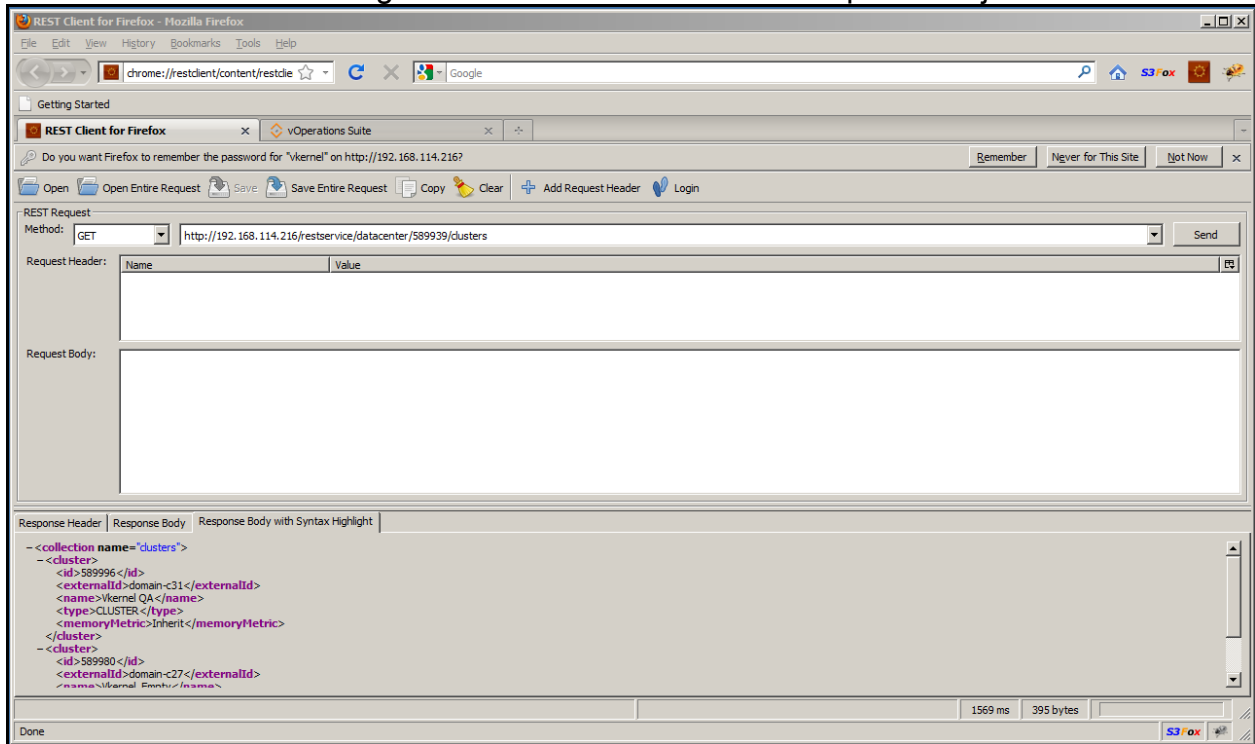
3.2 Specific Infrastructure Object Access Example

To access a list of all of the actual objects contained within a specific container object, use the following HTTP **Get** URL.

http://{ appliance url }/restservice/{ specific object name}/{ specific object identifier}/{ object name}

Using the identifier for datacenter – 2, the following example shows all of the **clusters**.

Please note that the trailing “s” must be removed from the specific object name.



4 Analysis Results Object Access

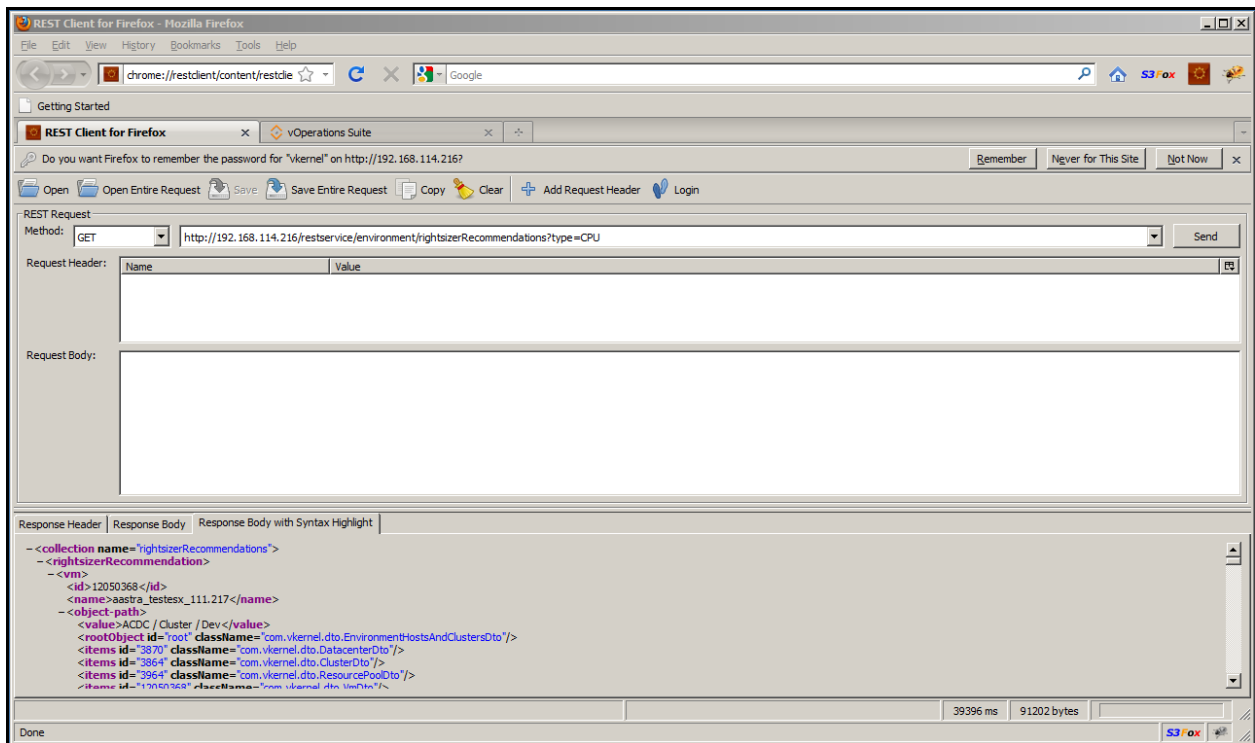
All of the analysis results objects may be accessed.

4.1 Analysis Virtual Environment Access Example

Use the following HTTP **Get** URL to access the results of a specific VOperations Suite analysis for the entire virtual environment.

http://{ appliance url }/restservice/environment/{ analysis object name}[?{parameter}={parameter value}]

The following example shows all of the CPU rightsizing recommendations for the virtual environment.



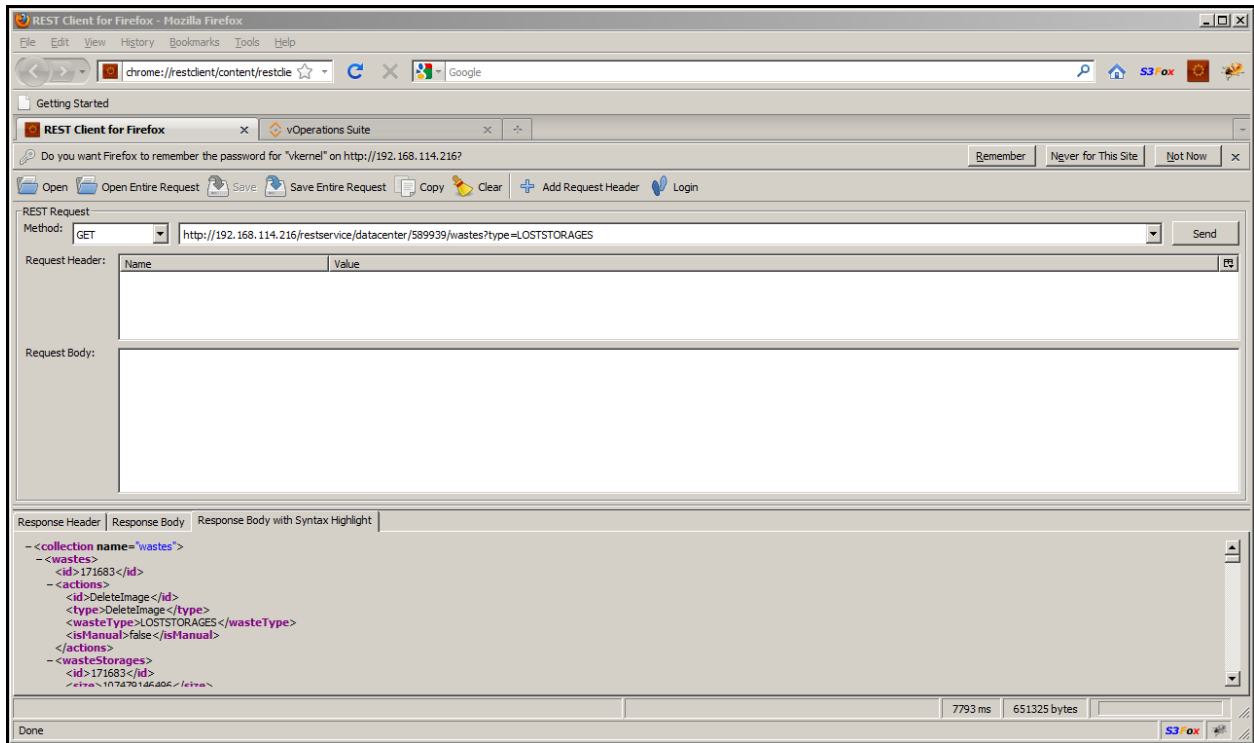
4.2 Analysis Specific Object Access Example

To access the results of a specific VOperations Suite analysis for a specific infrastructure object, use the following HTTP **Get** URL.

http://{ appliance url }/restservice/{ specific object name}/{ specific object identifier}/{analysis object name}[?parameter={parameter value}]

Using the identifier for datacenter – 2, the following example shows all of the

wastefinder abandoned virtual machines. Please note that the trailing “s” must be removed from the specific object name.



5 Customer Editing

Customers may be added, the contents of Customers may be modified, and Customers may be deleted.

5.1 Adding a Root Level Customer

Use the following HTTP **Put** URL to add a Customer at the root level.

http://{ appliance url }/restservice/environment/customers/add

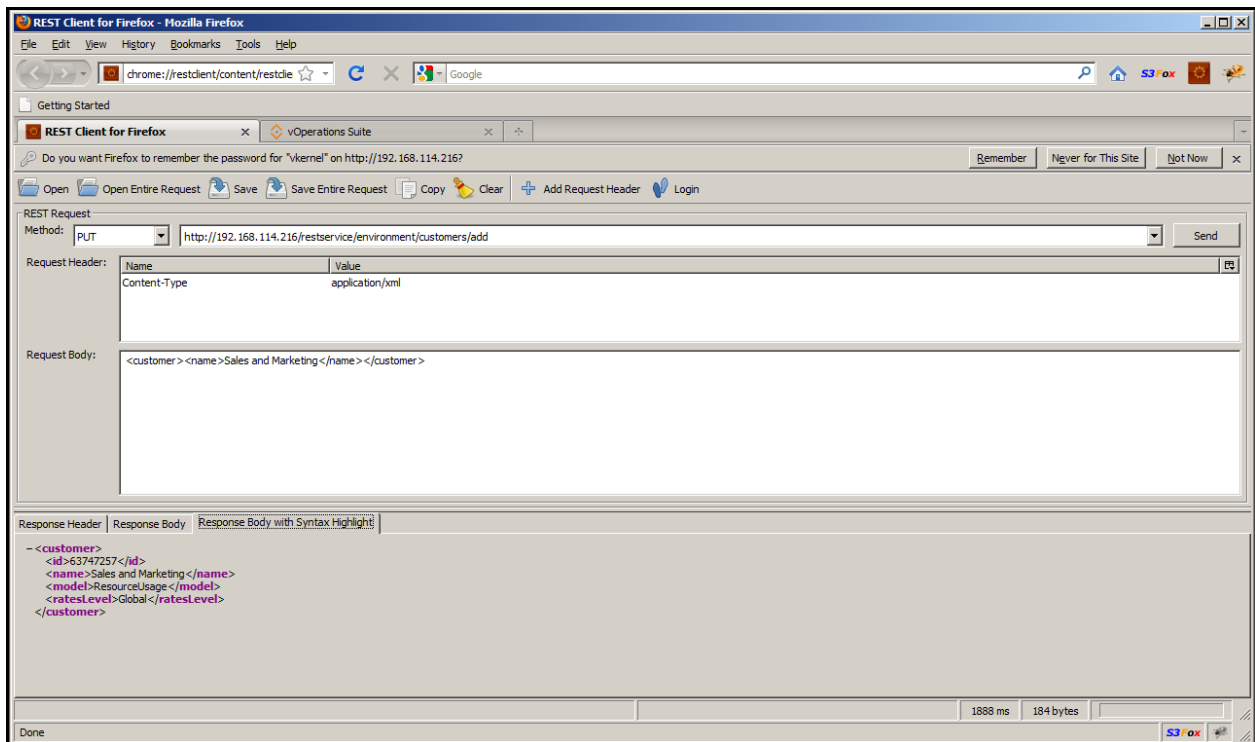
The Request Header must have the following name and value.

Content-Type application/xml

The Request Body must have the formatted name of the new Customer.

<customer><name>{Customer name}</name></customer>

The following example shows the addition of the **Sales and Marketing** Customer at the root level.



5.2 Adding a Business View to an Existing Customer

Use the following HTTP **Put** URL to add a Business View to a specific existing Customer.

http://{ appliance url }/restservice/customer/{existing Customer identifier}/add

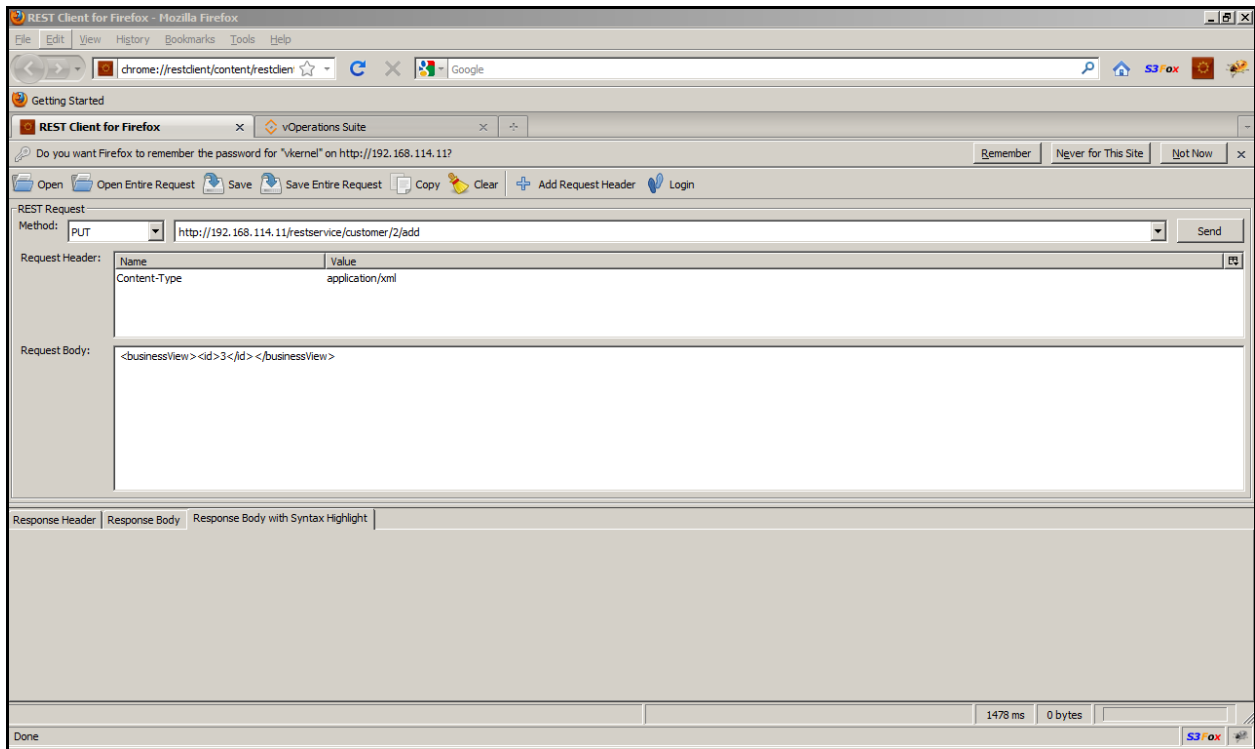
The Request Header must have the following name and value.

Content-Type application/xml

The Request Body must have the object identifier of the Business View to be added to the Customer.

<businessView><id>{Business View identifier}</id></businessView>

The following example shows addition of the **Sales Virtual Machines** Business View to the existing Sales and Marketing Customer.



5.3 Removing a Business View from a Customer

Use the following HTTP **Delete** URL to remove a Business View from a specific Customer.

http://{ appliance url }/restservice/customer/{specific Customer identifier}/remove

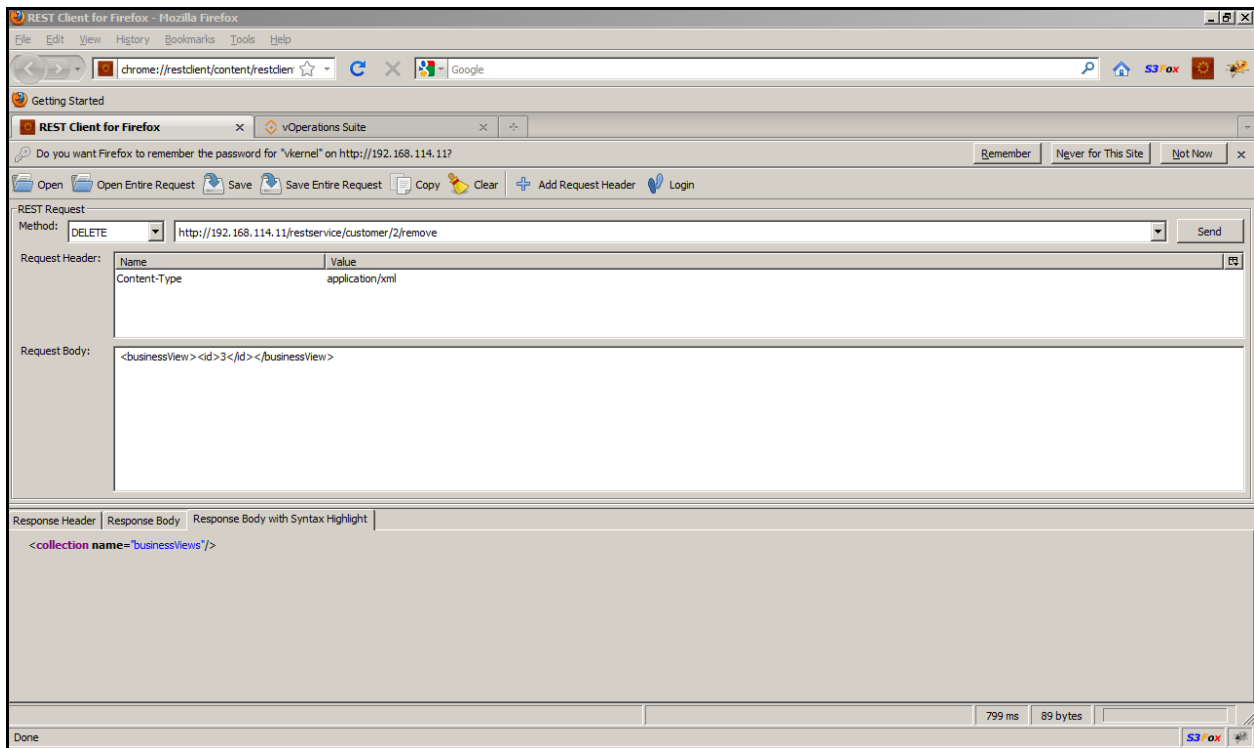
The Request Header must have the following name and value.

Content-Type application/xml

The Request Body must have the object identifier of the Business View to be removed from the Customer.

<businessView><id>{specific Business View identifier}</id></businessView>

The following example shows the removal of the **Sales Virtual Machines** Business View from the **Sales and Marketing** Customer.

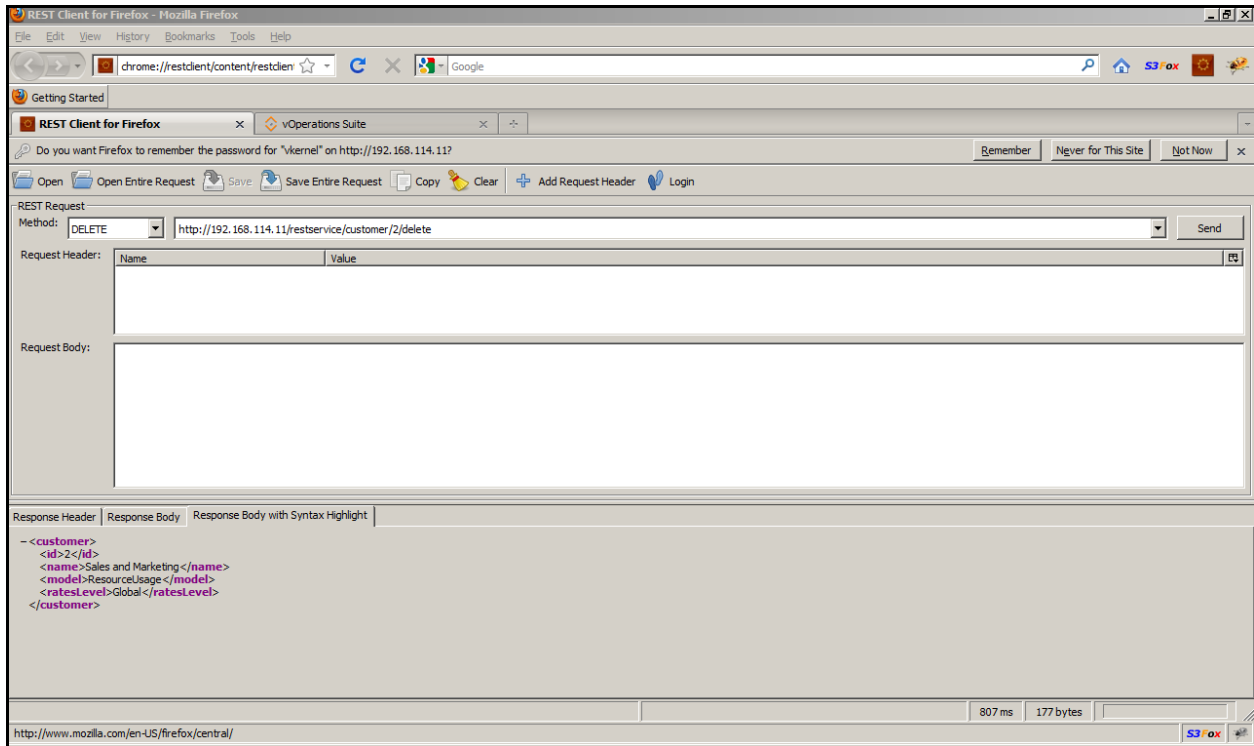


5.4 Deleting a Customer

Use the following HTTP **Delete** URL to delete a specific Customer.

http://{ appliance url }/restservice/customer/{specific Customer identifier}/delete

The following example shows the deletion of the **Sales and Marketing** Customer.



6 Business View Editing

Business Views may be added, the contents of Business Views may be modified, and Business Views may be deleted.

6.1 Adding a Root Level Business View

Use the following HTTP **Put** URL to add a Business View at the root level.

http://{ appliance url }/restservice/environment/businessViews/add

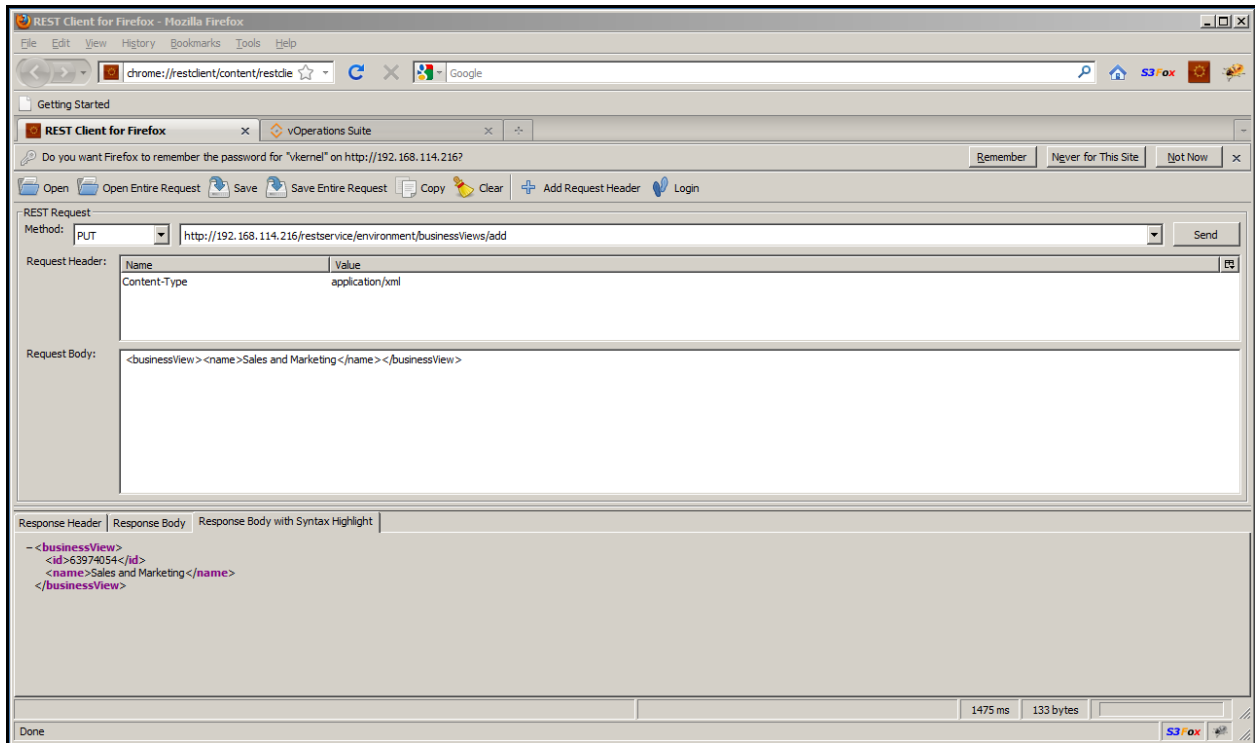
The Request Header must have the following name and value.

Content-Type application/xml

The Request Body must have the formatted name of the new Business View.

<businessView><name>{Business View name}</name></businessView>

The following example shows the addition of the **Sales and Marketing** Business View at the root level.



6.2 Adding a Business View to an Existing Business View

Use the following HTTP **Put** URL to add a Business View to a specific existing Business View.

http://{ appliance url }/restservice/businessView/{existing Business View identifier}/add

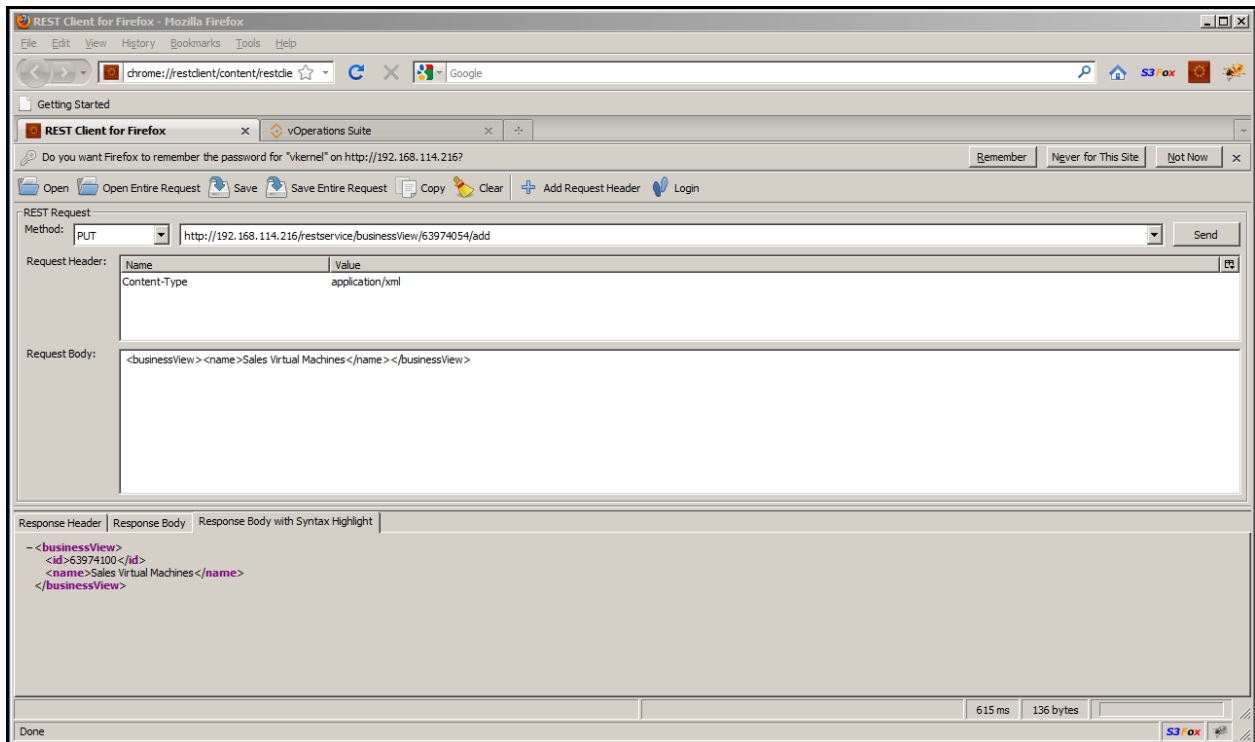
The Request Header must have the following name and value.

Content-Type application/xml

The Request Body must have the formatted name of the new Business View.

<businessView><name>{Business View name}</name></businessView>

The following example shows addition of the **Sales Virtual Machines** Business View to the existing Sales and Marketing Business View.



6.3 Adding an Infrastructure Object to a Business View

Use the following HTTP **Put** URL to add an Infrastructure Object to a specific Business View.

http://{ appliance url }/restservice/businessView/{specific Business View identifier}/add

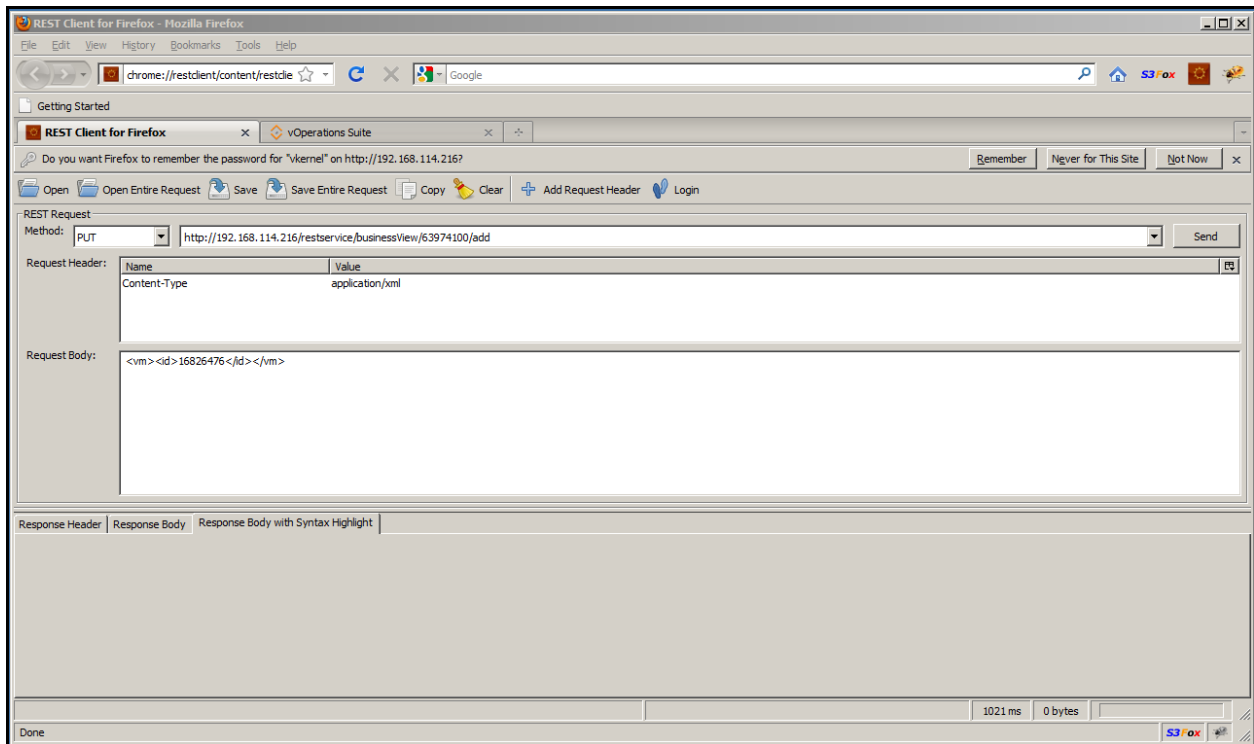
The Request Header must have the following name and value.

Content-Type application/xml

The Request Body must have the object type and identifier of the Infrastructure Object to be added to the Business View.

```
<datacenter><id>{specific Datacenter identifier}</id></datacenter>
<cluster><id>{specific Cluster identifier}</id></cluster>
<hostCompResource><id>{specific Individual Host identifier}</id></
hostCompResource >
<pool><id>{specific Resource Pool identifier}</id></pool>
<vm><id>{specific Virtual Machine identifier}</id></vm>
```

The following example shows the addition of a Virtual Machine to the **Sales Virtual Machines** Business View.



6.4 Removing an Infrastructure Object from a Business View

Use the following HTTP **Delete** URL to remove an Infrastructure Object from a specific Business View.

http://{ appliance url }/restservice/businessView/{specific Business View identifier}/remove

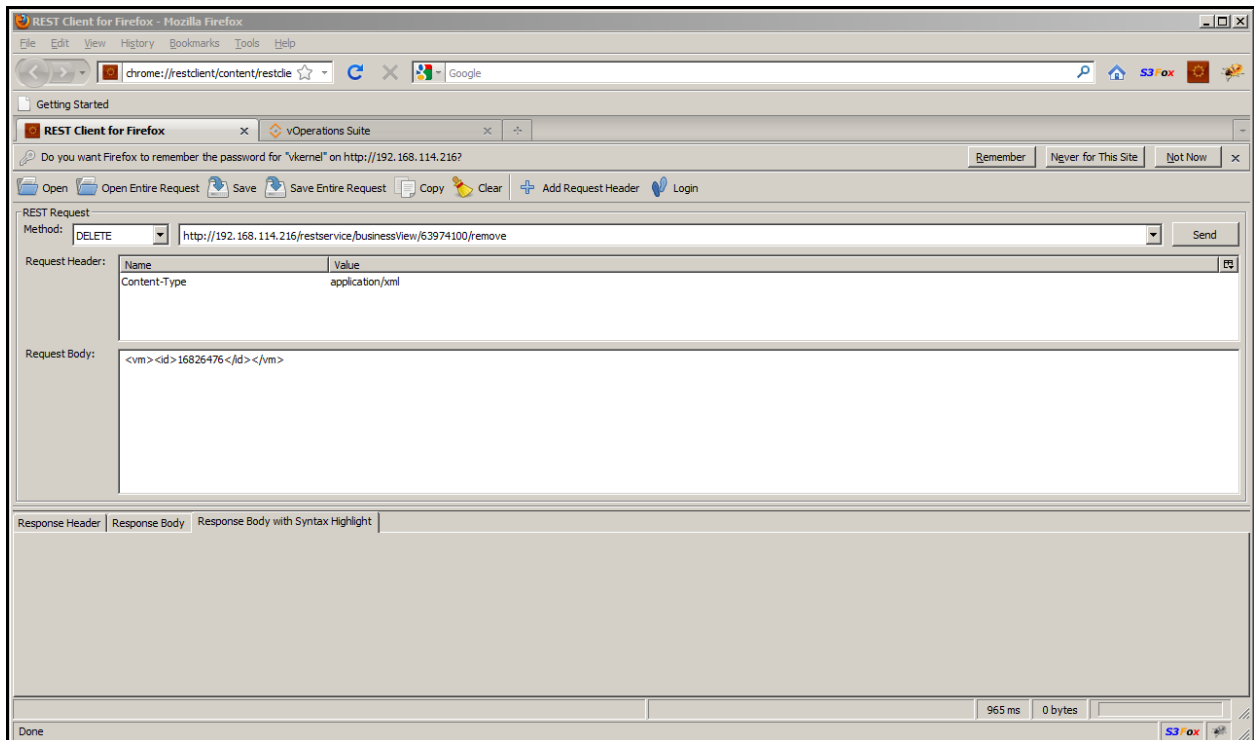
The Request Header must have the following name and value.

Content-Type application/xml

The Request Body must have the object type and identifier of the Infrastructure Object to be removed from the Business View.

```
<businessView><id>{specific Business View identifier}</id></businessView>
<datacenter><id>{specific Datacenter identifier}</id></datacenter>
<cluster><id>{specific Cluster identifier}</id></cluster>
<hostCompResource><id>{specific Individual Host identifier}</id></
hostCompResource >
<pool><id>{specific Resource Pool identifier}</id></pool>
<vm><id>{specific Virtual Machine identifier}</id></vm>
```

The following example shows the removal of a Virtual Machine from the **Sales Virtual Machines** Business View.

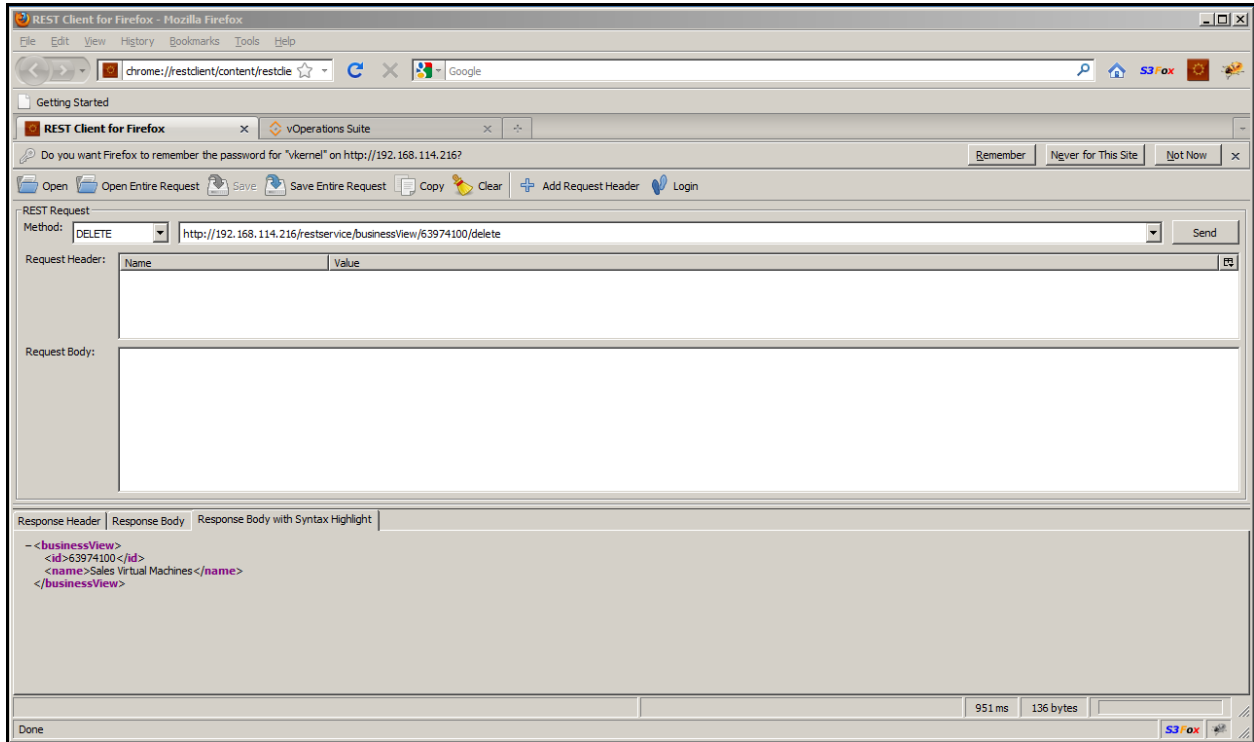


6.5 Deleting a Business View

Use the following HTTP **Delete** URL to delete a specific Business View.

http://{ appliance url }/restservice/businessView/{specific Business View identifier}/delete

The following example shows the deletion of the **Sales Virtual Machines** Business View.



7 Basic Infrastructure Hierarchy

The hierarchy of the infrastructure container objects is as follows:

- connections** – the connections to the virtual environment
- environment** – the overall virtual environment
 - customers** – the organizational entities that pay for the virtual environment
 - businessViews** – the business organization of the virtual environment objects
 - dcFolders** – the virtual environment data center folders
- customers** – the organizational entities that pay for the virtual environment
 - businessViews** – the business organization of the virtual environment objects
- businessViews** – the business organization of the virtual environment objects
 - businessViews** – the business organization of the virtual environment objects
 - dcFolders** – the virtual environment data center folders
 - datacenters** – the virtual environment data centers
 - hostFolders** – the datacenter host folders
 - vmFolders** – the datacenter virtual machine folders
 - clusters** – the datacenter clusters
 - hostCompResources** – the datacenter individual hosts
 - pools** – the cluster, host or resource pool resource pools
 - vms** – the cluster, host or resource pool virtual machines
 - storages** - the virtual datastores
- dcFolders** – the virtual environment data center folders
 - datacenters** – the virtual environment data centers
- datacenters** – the virtual environment data centers
 - hostFolders** – the datacenter host folders
 - vmFolders** – the datacenter virtual machine folders
 - clusters** – the datacenter clusters
 - hostCompResources** – the datacenter individual hosts
 - storages** - the virtual datastores
- hostFolders** – the datacenter host folders
 - hostFolders** – the datacenter host folders
 - clusters** – the datacenter clusters
 - hostCompResources** – the datacenter individual hosts
 - storages** - the virtual datastores
- vmFolders** – the datacenter virtual machine folders
 - vmFolders** – the datacenter virtual machine folders
 - vms** – the cluster, host or resource pool virtual machines
 - storages** - the virtual datastores
- clusters** – the datacenter clusters

hostSystems – the cluster hosts

pools – the cluster, host or resource pool resource pools

vms – the cluster, host or resource pool virtual machines

storages - the virtual datastores

hostCompResources the datacenter individual hosts

pools – the cluster, host or resource pool resource pools

vms – the cluster, host or resource pool virtual machines

storages - the virtual datastores

pools – the cluster, host or resource pool resource pools

pools – the cluster, host or resource pool resource pools

vms – the cluster, host or resource pool virtual machines

storages - the virtual datastores

vms – the cluster, host or resource pool virtual machines

storages - the virtual datastores

8 API Accessible Objects

There are two types of objects accessible through the API: infrastructure objects and analysis objects

8.1 Infrastructure Objects

The Infrastructure Objects are the various objects in the virtual environment infrastructure.

8.1.1 connections – the connections to the virtual environment

8.1.1.1 connection objects

None

8.1.1.2 connections response format

```
<collection name="connections">
  <connection>
    <id>1</id>
    <dateOfCreation>2010-07-29T15:52:10.070+04:00</dateOfCreation>
    <password>vkernel</password>
    <registerInVC>false</registerInVC>
    <status>ConnectionOK</status>
    <type>VC</type>
    <url>192.168.111.8</url>
    <userName>vkernel</userName>
    <createAlarms>true</createAlarms>
  </connection>
</collection>
```

8.1.2 environment – the overall virtual environment

8.1.2.1 environment objects

customers
businessViews
dcFolders
datacenters
hostCompResources
storages
objectCurrentBottlenecks
futureBottlenecks
bottlenecksExcluded
cmCapacityAvailability

cmStorageStatistic
 cmStorages
 cmStorageVms
 cmTopConsumers
 rightsizerRecommendations
 rightsizerHistory
 rightsizerExcluded
 wastes
 wastefinderHistory
 wastefinderExcluded
 wastefinderTemplatesExcluded
 wastefinderFilesExcluded
 inventoryVms
 problems
 cmsAlarmsMonitoring
 vCenterAlarmsMonitoring
 trendAlarms
 cmsAlarmsHistory
 vcenterAlarmsHistory
 trendAlarmsHistory
 predictiveActiveAlarms

8.1.2.2 environments response format

None

8.1.3 customers – the organizational entities that pay for the virtual environment

8.1.3.1 customer objects

businessViews
 chargeback-report

8.1.3.2 customers response format

```
<collection name="customers">
  <customer>
    <id>1</id>
    <name>Test</name>
    <model>ResourceUsage</model>
    <ratesLevel>Global</ratesLevel>
  </customers>
</collection>
```

8.1.4 businessViews – the business organization of the virtual environment objects

8.1.4.1 businessView objects

customers
 businessViews
 inventories
 storages
 objectCurrentBottlenecks
 futureBottlenecks
 bottlenecksExcluded
 cmCapacityAvailability
 cmStorageStatistic
 cmStorages
 cmStorageVms
 cmTopConsumers
 rightsizerRecommendations
 rightsizerHistory
 rightsizerExcluded
 wastes
 wastefinderHistory
 wastefinderExcluded
 wastefinderTemplatesExcluded
 wastefinderFilesExcluded
 inventoryVms
 fixedCosts
 alerts
 problems
 cmsAlarmsMonitoring
 vCenterAlarmsMonitoring
 cmsAlarmsHistory
 vcenterAlarmsHistory
 trendAlarmHistory
 predictiveActiveAlarms

8.1.4.2 businessViews response format

```
<collection name="businessViews">
  <businessView>
    <id>7</id>
    <description>cluster</description>
    <name>SAP</name>
  </businessView>
</collection>
```

8.1.5 dcFolders – the virtual environment data center folders

8.1.5.1 dcFolder objects

dcFolders
 datacenters
 objectCurrentBottlenecks
 futureBottlenecks
 bottlenecksExcluded
 cmCapacityAvailability
 cmStorageStatistic
 cmStorages
 cmStorageVms
 cmTopConsumers
 rightsizerRecommendations
 rightsizerHistory
 rightsizerExcluded
 wastes
 wastefinderHistory
 wastefinderExcluded
 wastefinderTemplatesExcluded
 wastefinderFilesExcluded
 inventoryVms
 alerts
 problems
 cmsAlarmsMonitoring
 vCenterAlarmsMonitoring
 cmsAlarmsHistory
 vcenterAlarmsHistory
 trendAlarmsHistory
 predictiveActiveAlarms

8.1.5.2 dcFolders response format

```
<collection name="dcFolders">
  <dcFolder>
    <id>353</id>
    <externalId>group-d2620</externalId>
    <name>New Folder</name>
    <type>DC_FOLDER</type>
    <memoryMetric>Inherit</memoryMetric>
    <connection>
      <id>1</id>
      <dateOfCreation>2011-04-04T13:11:05.167+03:00</dateOfCreation>
      <type>VC</type>
      <url>192.168.111.8</url>
    </connection>
  </dcFolder>
</collection>
```

```

        </connection>
        <root>true</root>
    </dcFolder>
</collection>

```

8.1.6 datacenters – the virtual environment data centers

8.1.6.1 datacenter objects

hostFolders
 vmFolders
 clusters
 hostCompResources
 vms
 objectCurrentBottlenecks
 futureBottlenecks
 bottlenecksExcluded
 cmCapacityAvailability
 cmStorageStatistic
 cmStorages
 cmStorageVms
 cmTopConsumers
 rightsizerRecommendations
 rightsizerHistory
 rightsizerExcluded
 wastes
 wastefinderHistory
 wastefinderExcluded
 wastefinderTemplatesExcluded
 wastefinderFilesExcluded
 inventoryVms
 alerts
 problems
 cmsAlarmsMonitoring
 vCenterAlarmsMonitoring
 cmsAlarmsHistory
 vcenterAlarmsHistory
 trendAlarmsHistory
 predictiveActiveAlarms

8.1.6.2 datacenter response format

```

<collection name="datacenters">
  <datacenter>
    <id>720</id>
    <alarmState>Alarm</alarmState>
  </datacenter>
</collection>

```

```

    <externalId>datacenter-41</externalId>
    <name>ESX4.0</name>
    <type>DATACENTER</type>
    <memoryMetric>Inherit</memoryMetric>
  </datacenter>
</collection>

```

8.1.7 hostFolders – the data center host folders

8.1.7.1 hostFolder objects

hostFolders
 clusters
 hostCompResources
 objectCurrentBottlenecks
 futureBottlenecks
 bottlenecksExcluded
 cmCapacityAvailability
 cmStorageStatistic
 cmStorages
 cmStorageVms
 cmTopConsumers
 rightsizerRecommendations
 rightsizerHistory
 rightsizerExcluded
 wastes
 wastefinderHistory
 wastefinderExcluded
 wastefinderTemplatesExcluded
 wastefinderFilesExcluded
 inventoryVms
 alerts
 problems
 cmsAlarmsMonitoring
 vCenterAlarmsMonitoring
 cmsAlarmsHistory
 vcenterAlarmsHistory
 trendAlarmsHistory
 predictiveActiveAlarms

8.1.7.2 hostFolders response format

```

<collection name="hostFolders">
  <hostFolder>
    <id>1094</id>
    <alarmState>Alarm</alarmState>
  </hostFolder>
</collection>

```

```
        <externalId>group-h2883</externalId>
        <name>New Folder</name>
        <type>HOST_FOLDER</type>
        <memoryMetric>Inherit</memoryMetric>
        <root>>false</root>
    </hostFolder>
</collection>
```

8.1.8 vmFolders – the data center virtual machine folders

8.1.8.1 vmFolder objects

vmFolders
vms
objectCurrentBottlenecks
futureBottlenecks
bottlenecksExcluded
cmCapacityAvailability
cmStorageStatistic
cmStorages
cmStorageVms
cmTopConsumers
rightsizerRecommendations
rightsizerHistory
rightsizerExcluded
wastes
wastefinderHistory
wastefinderExcluded
wastefinderTemplatesExcluded
wastefinderFilesExcluded
inventoryVms
alerts
problems
cmsAlarmsMonitoring
vCenterAlarmsMonitoring
cmsAlarmsHistory
vcenterAlarmsHistory
trendAlarmsHistory

8.1.8.2 vmFolders response format

```
<collection name="vmFolders">
  <vmFolder>
    <id>3</id>
    <externalId>group-v5</externalId>
    <name>Discovered Virtual Machine</name>
```

```

    <type>VM_FOLDER</type>
    <memoryMetric>Inherit</memoryMetric>
    <root>>false</root>
  </vmFolder>
</collection>

```

8.1.9 clusters – the datacenter clusters

8.1.9.1 cluster objects

hostSystems
 pools
 vms
 objectCurrentBottlenecks
 futureBottlenecks
 bottlenecksExcluded
 cmCapacityAvailability
 cmStorageStatistic
 cmStorages
 cmStorageVms
 cmTopConsumers
 rightsizerRecommendations
 rightsizerHistory
 rightsizerExcluded
 wastes
 wastefinderHistory
 wastefinderExcluded
 wastefinderTemplatesExcluded
 wastefinderFilesExcluded
 inventoryVms
 alerts
 problems
 cmsAlarmsMonitoring
 vCenterAlarmsMonitoring
 cmsAlarmsHistory
 vcenterAlarmsHistory
 trendAlarmsHistory
 predictiveActiveAlarms

8.1.9.2 clusters response format

```

<collection name="clusters">
  <cluster>
    <id>586</id>
    <alarmState>Alarm</alarmState>
    <externalId>domain-c46</externalId>
  </cluster>
</collection>

```

```

    <name>Vkernel</name>
    <type>CLUSTER</type>
    <memoryMetric>Inherit</memoryMetric>
  </cluster>
</collection>

```

8.1.10 hostCompResources – the datacenter individual hosts

8.1.10.1 hostCompResource objects

pools
 vms
 objectCurrentBottlenecks
 futureBottlenecks
 bottlenecksExcluded
 cmCapacityAvailability
 cmStorageStatistic
 cmStorages
 cmStorageVms
 cmTopConsumers
 rightsizerRecommendations
 rightsizerHistory
 rightsizerExcluded
 wastes
 wastefinderHistory
 wastefinderExcluded
 wastefinderTemplatesExcluded
 wastefinderFilesExcluded
 inventoryVms
 alerts
 problems
 cmsAlarmsMonitoring
 vCenterAlarmsMonitoring
 cmsAlarmsHistory
 vcenterAlarmsHistory
 trendAlarmsHistory
 predictiveActiveAlarms

8.1.10.2 hostCompResources response format

```

<collection name="hostCompResources">
  <hostCompResource>
    <id>1735953</id>
    <externalId>domain-s31</externalId>
    <name>192.168.111.99</name>
  </hostCompResource>
</collection>

```

```

    <type>HOST_COMPUTERRESOURCE</type>
    <memoryMetric>Inherit</memoryMetric>
    <hostId>1736005</hostId>
    <powerState>OFF</powerState>
    <state>INVALID</state>
  </hostCompResource>
</collection>

```

8.1.11 hostSystems – the cluster hosts

8.1.11.1 hostSystem objects

objectCurrentBottlenecks
 futureBottlenecks
 bottlenecksExcluded
 cmCapacityAvailability
 cmStorageStatistic
 cmStorages
 cmStorageVms
 cmTopConsumers
 rightsizerRecommendations
 rightsizerHistory
 rightsizerExcluded
 wastes
 wastefinderHistory
 wastefinderExcluded
 wastefinderTemplatesExcluded
 wastefinderFilesExcluded
 inventoryVms
 rates
 alerts
 problems
 cmsAlarmsMonitoring
 vCenterAlarmsMonitoring
 cmsAlarmsHistory
 vcenterAlarmsHistory
 trendAlarmsHistory
 predictiveActiveAlarms

8.1.11.2 hostSystems response format

```

<collection name="hostSystems">
  <hostSystem>
    <id>572</id>
    <alarmState>Warning</alarmState>
  </hostSystem>
</collection>

```

```

    <externalId>host-479</externalId>
    <name>192.168.111.245</name>
    <type>HOST_SYSTEM</type>
    <memoryMetric>Inherit</memoryMetric>
    <dnsServer>192.168.111.51</dnsServer>
    <domainName>aleatis.lan</domainName>
    <hardwareModel/>
    <hardwareVendor/>
    <hostId>9</hostId>
    <hostName>esxvkernel2</hostName>
    <ip>192.168.111.245</ip>
    <memorySize>8579657728</memorySize>
    <numCpuCores>2</numCpuCores>
    <numCpuPackages>1</numCpuPackages>
    <numCpuThreads>2</numCpuThreads>
    <powerState>ON</powerState>
    <state>CONNECTED</state>
    <totalCpu>2319</totalCpu>
    <version>4.0.0</version>
    <versionBuild>171294</versionBuild>
    <versionFullName>VMware ESX 4.0.0 build-171294</versionFullName>
  </hostSystem>
</collection>

```

8.1.12 pools – the cluster, host or resource pool resource pools

8.1.12.1 pool objects

pools
 vms
 objectCurrentBottlenecks
 futureBottlenecks
 bottlenecksExcluded
 cmCapacityAvailability
 cmStorageStatistic
 cmStorages
 cmStorageVms
 cmTopConsumers
 rightsizerRecommendations
 rightsizerHistory
 rightsizerExcluded
 wastes
 wastefinderHistory
 wastefinderExcluded
 wastefinderTemplatesExcluded

wastefinderFilesExcluded
 inventoryVms
 alerts
 problems
 cmsAlarmsMonitoring
 vCenterAlarmsMonitoring
 cmsAlarmsHistory
 vcenterAlarmsHistory
 trendAlarmsHistory
 predictiveActiveAlarms

8.1.12.2 pools response format

```
<collection name="pools">
  <pool>
    <id>588</id>
    <externalId>resgroup-100</externalId>
    <name>QA</name>
    <type>RESPOOL</type>
    <memoryMetric>Inherit</memoryMetric>
  </pool>
</collection>
```

8.1.13 vms – the cluster, host or resource pool virtual machines

8.1.13.1 vm objects

objectCurrentBottlenecks
 futureBottlenecks
 bottlenecksExcluded
 cmCapacityAvailability
 cmStorageStatistic
 cmStorages
 cmStorageVms
 cmTopConsumers
 rightsizerRecommendations
 rightsizerHistory
 rightsizerExcluded
 wastes
 wastefinderHistory
 wastefinderExcluded
 wastefinderTemplatesExcluded
 wastefinderFilesExcluded
 alerts
 problems
 cmsAlarmsMonitoring

vCenterAlarmsMonitoring
 cmsAlarmsHistory
 vcenterAlarmsHistory
 trendAlarmsHistory
 predictiveActiveAlarms

8.1.13.2 vms response format

```
<collection name="vms">
  <vm>
    <id>1132</id>
    <externalId>vm-3276</externalId>
    <name>anechaev-vim</name>
    <type>VMACHINE</type>
    <memoryMetric>Inherit</memoryMetric>
    <cpuLimitMhz>-1</cpuLimitMhz>
    <cpuTotalMhz>4638</cpuTotalMhz>
    <cpuReservationMhz>0</cpuReservationMhz>
    <cpuSharesLevel>normal</cpuSharesLevel>
    <memoryLimitKb>-1</memoryLimitKb>
    <memorySizeKb>3145728</memorySizeKb>
    <memoryReservationKb>0</memoryReservationKb>
    <guestDiskTotalCapacity>7391596544</guestDiskTotalCapacity>
    <memorySharesLevel>normal</memorySharesLevel>
    <powerState>OFF</powerState>
    <state>CONNECTED</state>
    <cpuCount>2</cpuCount>
    <importanceLevel>normal</importanceLevel>
    <hostId>9</hostId>
    <vmType>VM</vmType>
    <ipAddress>192.168.111.214</ipAddress>
  </vm>
</collection>
```

8.1.14 storages – the virtual datastores

8.1.14.1 storage objects

objectCurrentBottlenecks
 futureBottlenecks
 bottlenecksExcluded
 cmCapacityAvailability
 cmStorageStatistic
 cmStorages
 cmStorageVms

cmTopConsumers
 rightsizerRecommendations
 rightsizerHistory
 rightsizerExcluded
 wastes
 wastefinderHistory
 wastefinderExcluded
 wastefinderTemplatesExcluded
 wastefinderFilesExcluded
 inventoryVms
 rates
 problems
 cmsAlarmsMonitoring
 vCenterAlarmsMonitoring
 cmsAlarmsHistory
 vcenterAlarmsHistory
 trendAlarmsHistory

8.1.14.2 storages response format

```
<collection name="storages">
  <storage>
    <id>6</id>
    <freeSpace>2600563691520</freeSpace>
    <label>NFS_211</label>
    <name>NFS_211</name>
    <nfs>true</nfs>
    <size>2953474441216</size>
    <url>netfs://192.168.112.211//mnt/nfs/</url>
  </storage>
</collection>
```

8.2 Analysis Results Objects

The Analysis Results Objects provide the results of each of the VOperations Suite products.

8.2.1 objectCurrentBottlenecks – the current resource bottlenecks

8.2.1.1 objectCurrentBottlenecks parameter values

Set the **type** parameter to one of the following:

- OVERVIEW – All current bottlenecks (default)
- CPU – CPU bottlenecks only
- MEMORY – Memory bottlenecks only
- STORAGE – Storage bottlenecks only
- DISK_THROUGHPUT – Disk throughput bottlenecks only

DISK_LATENCY – – Disk latency bottlenecks only

8.2.1.2 objectCurrentBottlenecks response format

<http://vkernel.public.downloads.exe.s3.amazonaws.com/Documentation/objectCurrentBottlenecks.pdf>

8.2.2 futureBottlenecks – the future resource bottlenecks

8.2.2.1 futureBottlenecks parameter values

None

8.2.2.2 futureBottlenecks response format

<http://vkernel.public.downloads.exe.s3.amazonaws.com/Documentation/futureBottlenecks.pdf>

8.2.3 bottlenecksExcluded – the objects excluded from the current bottleneck analysis

8.2.3.1 bottlenecksExcluded parameter values

None

8.2.3.2 bottlenecksExcluded response format

<http://vkernel.public.downloads.exe.s3.amazonaws.com/Documentation/bottlenecksExcluded.pdf>

8.2.4 cmCapacityAvailability – the number of virtual machines which may be added to the clusters and clusters

8.2.4.1 cmCapacityAvailability parameter values

Set the **type** parameter to one of the following:

MaxHaMaxNonHa –Use maximum utilization for HA and non-HA enabled clusters (default)

MaxHaAvgNonHa –Use maximum utilization for HA and average utilization for non-HA enabled clusters

AvgHaAvgNonHa –Use average utilization for HA and non-HA enabled clusters

UserDefined – Use specified values for the analysis

8.2.4.2 cmCapacityAvailability response format

<http://vkernel.public.downloads.exe.s3.amazonaws.com/Documentation/cmCapacityAvailability.pdf>

8.2.5 cmStorageStatistic – the overall statistics for each of the datastores

8.2.5.1 cmStorageStatistic parameter values

None

8.2.5.2 cmStorageStatistic response format

<http://vkernel.public.downloads.exe.s3.amazonaws.com/Documentation/cmStorageStatistic.pdf>

8.2.6 cmStorages – the datastores

8.2.6.1 cmStorages parameter values

None

8.2.6.2 cmStorages response format

<http://vkernel.public.downloads.exe.s3.amazonaws.com/Documentation/cmStorages.pdf>

8.2.7 cmStorageVms – the virtual machines using the datastore

8.2.7.1 cmStorageVms parameter values

Set the **storageID** parameter to the datastore identifier.

8.2.7.2 cmStorageVms response format

<http://vkernel.public.downloads.exe.s3.amazonaws.com/Documentation/>

8.2.8 cmTopConsumers – the virtual machine resource usage

8.2.8.1 cmTopConsumers parameter values

None

8.2.8.2 cmTopConsumers response format

<http://vkernel.public.downloads.exe.s3.amazonaws.com/Documentation/cmTopConsumers.pdf>

8.2.9 rightsizerRecommendations – the recommendations for resource allocation

8.2.9.1 rightsizerRecommendations parameter values

Set the **type** parameter to one of the following:

Summary – All rightsizing recommendations (default)

CPU – CPU recommendations only

Memory – Memory recommendations only
Storage – Storage recommendations only

8.2.9.2 rightsizerRecommendations response format

<http://vkernel.public.downloads.exe.s3.amazonaws.com/Documentation/rightsizerRecommendations.pdf>

8.2.10 rightsizerHistory – all of the recommendations that were executed

8.2.10.1 rightsizerHistory parameter values

None

8.2.10.2 rightsizerHistory response format

<http://vkernel.public.downloads.exe.s3.amazonaws.com/Documentation/rightsizerHistory.pdf>

8.2.11 rightsizerExcluded – the objects excluded from the recommendations

8.2.11.1 rightsizerExcluded parameter values

None

8.2.11.2 rightsizerExcluded response format

<http://vkernel.public.downloads.exe.s3.amazonaws.com/Documentation/rightsizerExcluded.pdf>

8.2.12 wastes – the resources that are currently wasted

8.2.12.1 wastes parameter values

Set the **type** parameter to one of the following:

- LOSTSTORAGES – Abandoned virtual machines (default)
- POWEROFFS – Powered off virtual machines
- TEMPLATES – Unused templates
- STORAGEWASTES – Unused snapshots
- ZOMBIE – Idle virtual machines

8.2.12.2 wastes response format

<http://vkernel.public.downloads.exe.s3.amazonaws.com/Documentation/wastes.pdf>

8.2.13 wastefinderHistory – all of the recommendations that were executed

8.2.13.1 wastefinderHistory parameter values

none

8.2.13.2 wastefinderHistory response format

<http://vkernel.public.downloads.exe.s3.amazonaws.com/Documentation/wastefinderHistory.pdf>

8.2.14 wastefinderExcluded – the objects excluded from the waste analysis**8.2.14.1 wastefinderExcluded parameter values**

None

8.2.14.2 wastefinderExcluded response format

<http://vkernel.public.downloads.exe.s3.amazonaws.com/Documentation/wastefinderExcluded.pdf>

8.2.15 wastefinderTemplatesExcluded – the templates excluded from the waste analysis**8.2.15.1 wastefinderTemplatesExcluded parameter values**

None

8.2.15.2 wastefinderTemplatesExcluded response format

<http://vkernel.public.downloads.exe.s3.amazonaws.com/Documentation/wastefinderTemplatesExcluded.pdf>

8.2.16 wastefinderFilesExcluded – the files excluded from the waste analysis**8.2.16.1 wastefinderFilesExcluded parameter values**

None

8.2.16.2 wastefinderFilesExcluded response format

<http://vkernel.public.downloads.exe.s3.amazonaws.com/Documentation/wastefinderFilesExcluded.pdf>

8.2.17 inventoryVms – the virtual machines from inventory**8.2.17.1 inventoryVms parameter values**

None

8.2.17.2 inventoryVms response format

<http://vkernel.public.downloads.exe.s3.amazonaws.com/Documentation/inventoryVMs.pdf>

8.2.18 fixedCosts – the fixed costs set in the business view

8.2.18.1 fixedCosts parameter values

None

8.2.18.2 fixedCosts response format

<http://vkernel.public.downloads.exe.s3.amazonaws.com/Documentation/fixedCosts.pdf>

8.2.19 rates – the rates set for the host(s) or datastore

8.2.19.1 rates parameter values

None

8.2.19.2 rates response format

<http://vkernel.public.downloads.exe.s3.amazonaws.com/Documentation/rates.pdf>

8.2.20 chargeback-report – the chargeback report for a specific customer

8.2.20.1 chargeback-report parameter values

Set the **periodType** parameter to one of the following:

THIS_DAY
LAST_DAY
THIS_WEEK
LAST_WEEK
THIS_MONTH
LAST_MONTH
THIS_QUARTER
LAST_QUARTER
THIS_YEAR
LAST_YEAR
CUSTOM_PERIOD

If the CUSTOM_PERIOD **periodType** is selected, set the start and end dates as follows:

periodType=CUSTOM_PERIOD&startDate=01/15/2011&endDate=02/28/2011

8.2.20.2 chargeback-report response format

<http://vkernel.public.downloads.exe.s3.amazonaws.com/Documentation/chargeback-report.pdf>

8.2.21 alerts – the currently set alerts

8.2.21.1 alerts parameter values

None

8.2.21.2 alerts response format

<http://vkernel.public.downloads.exe.s3.amazonaws.com/Documentation/>

8.2.22 problems – the monitor root cause analysis

8.2.22.1 problems parameter values

None

8.2.22.2 problems response format

<http://vkernel.public.downloads.exe.s3.amazonaws.com/Documentation/problems.pdf>

8.2.23 cmsAlarmsMonitoring – the current capacity alarms

8.2.23.1 cmsAlarmsMonitoring parameter values

None

8.2.23.2 cmsAlarmsMonitoring response format

<http://vkernel.public.downloads.exe.s3.amazonaws.com/Documentation/cmsAlarmsMonitoring.pdf>

8.2.24 vCenterAlarmsMonitoring – the current vCenter alarms

8.2.24.1 vCenterAlarmsMonitoring parameter values

None

8.2.24.2 vCenterAlarmsMonitoring response format

<http://vkernel.public.downloads.exe.s3.amazonaws.com/Documentation/vCenterAlarmsMonitoring.pdf>

8.2.25 trendAlarms – the currently active trend alarms

8.2.25.1 trendAlarms parameter values

None

8.2.25.2 trendAlarms response format

<http://vkernel.public.downloads.exe.s3.amazonaws.com/Documentation/trendAlarms.pdf>

8.2.26 cmsAlarmsHistory – the history of all capacity alarms

8.2.26.1 cmsAlarmsHistory parameter values

None

8.2.26.2 cmsAlarmsHistory response format

<http://vkernel.public.downloads.exe.s3.amazonaws.com/Documentation/>

8.2.27 vCenterAlarmsHistory – the history of all vCenter alarms

8.2.27.1 vcenterAlarmsHistory parameter values

None

8.2.27.2 vcenterAlarmsHistory response format

<http://vkernel.public.downloads.exe.s3.amazonaws.com/Documentation/>

8.2.28 trendAlarmsHistory – the history of all trend alarms

8.2.28.1 trendAlarmsHistory parameter values

None

8.2.28.2 trendAlarmsHistory response format

<http://vkernel.public.downloads.exe.s3.amazonaws.com/Documentation/>

8.2.29 predictiveActiveAlarms – all active predictive alarms

8.2.29.1 predictiveActiveAlarms parameter values

None

8.2.29.2 predictiveActiveAlarms response format

<http://vkernel.public.downloads.exe.s3.amazonaws.com/Documentation/predictiveActiveAlarms.pdf>