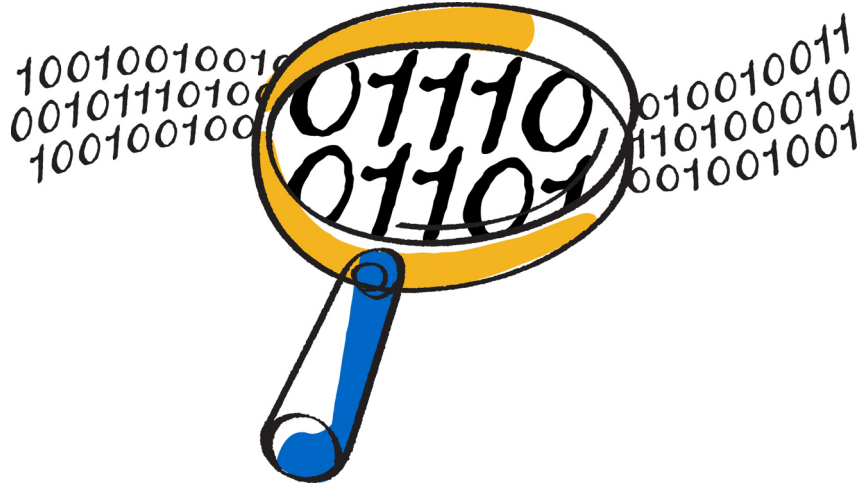




OnCommand® Cloud Manager 2.1

API Getting Started Guide



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How the REST APIs work

OnCommand Cloud Manager includes REST APIs that enable software developers to automate the management of NetApp storage in the cloud. There is an API for every action that is available from the user interface. You should understand how the APIs work before you get started.

API resources

The Cloud Manager APIs enable you to perform operations on different types of resources. The resources are broadly categorized as follows:

- **Administrative resources**
Used to set up and configure Cloud Manager
- **Auditing resources**
Used to view details about Cloud Manager operations
- **Authentication resources**
Used to authenticate with Cloud Manager so you can run API operations
- **Working environment resources**
Used to deploy and manage working environments: Cloud ONTAP systems and Data ONTAP clusters

API endpoint

Cloud Manager API URLs are relative to `http://ip_address:port/occm/api`.

For example, the request URL to launch a Cloud ONTAP instance is `http://ip_address:port/occm/api/vsa/working-environments`.

Authentication

Most API operations require authentication. To authenticate with Cloud Manager, you run a POST operation to `/occm/api/auth/login` with the following body value:

```
{
    email: "string",
    password: "string"
}
```

API request and response formats

The REST API issues calls through HTTP requests and responses. The HTTP message body carries data objects in readable strings, in the default JSON (JavaScript Object Notation) format.

Responses can be a JSON object, or an array of JSON objects.

The format of a JSON object is as follows:

```
{
  name: "string"
}
```

The format of an array of JSON objects is as follows:

```
[
  {name: "string"}, {name: "string"}
]
```

Header fields

You must specify the Content-Type field in the header for each API call. The Accept field is optional. Both fields must be set to **application/json** for most API calls:

```
Accept: application/json
Content-Type: application/json
```

Note: The server automatically returns content in JSON format if Accept is not specified.

The API reference identifies when Content-Type and Accept must be set to different values. For example, for backup API calls, Content-Type must be set to **multipart/form-data** and for restore API calls, Accept must be set to **application/octet-stream**.

Each API returns a custom HTTP header field named OnCloud-Request-Id. You can use the value of this field to track the progress of requests using the audit API calls.

Public IDs

All Cloud Manager resources (for example, users, tenants, and working environments) are assigned a public ID. Whenever a resource is created or returned, the public ID is displayed in the response. You must specify a resource's public ID when performing operations on the resource. For example, you must specify the public ID for a working environment when you create a volume.

HTTP status codes

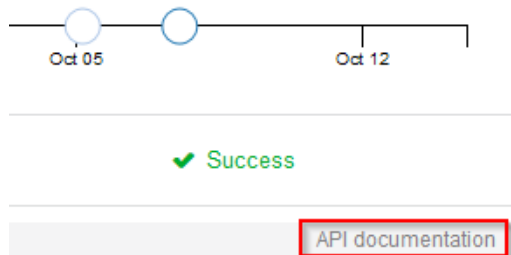
HTTP code	Description
200	The operation was completed successfully and the API sent a response.
202	The operation was accepted and is currently in process. Cloud Manager returns this code when the API operation returns before the actual operation finishes. For example, the <code>/vsa/working-environments</code> operation returns with code 202, but the Cloud ONTAP instance successfully launches up to 25 minutes later.
204	The operation was completed successfully and the API did not send a response.
400	There was an error with the client's request. An error response explains the reason.
401	The user has not authenticated.
403	The user has authenticated but does not have permissions to perform the operation on the resource.
409	Volume creation failed for validation reasons.
420	Cloud Manager has not been set up. You must set up Cloud Manager using the API call <code>/occm/setup/init</code>
5xx	An error occurred with the Cloud Manager server.

Accessing the API reference and running operations using Swagger

Cloud Manager provides interactive API documentation through the Swagger interface. You can use Swagger to find descriptions of the APIs and to run the operations.

Steps

1. Click the link in the lower-right corner of the console, or enter the URL **`http://server/occm/api-doc`** in your web browser.



2. Expand the operations for the API calls to view the API descriptions.

Example

The following image shows an API description:

POST /tenants Creates a new tenant.

Response Class
Model | Model Schema

```

TenantResponse {
  name (string, optional),
  publicId (string, optional),
  costCenter (string, optional),
  description (string, optional),
  nssUserName (string, optional)
}

```

Response Content Type: application/json

Parameters

Parameter	Value	Description	Parameter Type	Data Type
body	<pre>{ "name": "IT" }</pre>	Tenant creation parameters	body	Model Model Schema

Parameter content type: application/json

Try it out!

API description

```

AddTenantRequest {
  name (string, optional),
  description (string, optional),
  costCenter (string, optional),
  nssKeys (SetNssKeysRequest, optional)
}

SetNssKeysRequest {
  nssUserName (string, optional),
  nssPassword (string, optional)
}

```

3. If desired, run the operations directly from Swagger by entering values for the parameters and then clicking **Try it out!**

Example

The following image shows an example result:

The image displays a Swagger API response example for the `/tenants` endpoint. It is organized into four sections: Request URL, Response Body, Response Code, and Response Headers.

Request URL

```
http://host2012.eng.example.com:80/occm/api/tenants
```

Response Body

```
{
  "name": "IT",
  "publicId": "Tenant-I1HBTyw4",
  "costCenter": null,
  "description": null,
  "nssUserName": null
}
```

Response Code

```
200
```

Response Headers

```
{
  "Date": "Tue, 07 Jul 2015 13:29:48 GMT",
  "Connection": "Keep-Alive",
  "Content-Type": "application/json",
  "Transfer-Encoding": "chunked",
  "Oncloud-Request-Id": "7qVMFKqU"
}
```

API examples

Reviewing API examples can help you understand how to use the Cloud Manager APIs yourself. The examples use curl as the HTTP client.

Setting up Cloud Manager

The following operation sets up Cloud Manager after installation:

```
curl http://localhost/occm/api/occm/setup/init -X POST --header "Content-Type:application/json" --data "{ \"proxyUrl\": { \"uri\": \"\" },
\"userRequest\":{ \"email\": \"%email%\", \"lastName\": \"admin\",
\"firstName\": \"admin\", \"accessKey\": \"AKIAIHLVG60DBNXXFAKE\",
\"roleId\": \"Role-1\", \"secretKey\": \"fpZq10S4ygA/DeDkEokyvviH/
eHzjgcqfsNdXFAKE\", \"password\": \"%password%\" }, \"site\": \"site\",
\"company\": \"company\", \"tenantRequest\": { \"name\": \"Tenant1\",
\"description\": \"\", \"costCenter\": \"\", \"nssKeys\": {} } }"
```

Logging in to Cloud Manager

The following API call invokes the authentication API, which provides a temporary cookie. The cookie is stored in a `cookies.txt` file, which you can use in subsequent API calls to identify the client.

```
curl http://localhost/occm/api/auth/login --header "Content-Type:
application/json" --data "{ \"email\": \"%email%\", \"password\":
\"%password%\" }" --cookie-jar cookies.txt
```

Creating a Tenant Admin

Before you can create a Tenant Admin user account, you must identify the ID of the tenant in which you want to create the user account. The following API call provides the tenant ID:

```
curl http://localhost/occm/api/tenants -X GET --header "Content-Type:
application/json" --cookie cookies.txt | jq -r .[0].publicId > temp.txt
set /p tenantId=< temp.txt
```

An example response follows (the “publicId” is the tenant ID):

```
{
  "name": "test tenant2",
  "publicId": "Tenant-Z2MIYAwB",
  "costCenter": null,
  "description": null,
  "nssUserName": null,
  "workingEnvironmentsInformation": null
}
```

You can subsequently create the user account by specifying the tenant ID:

```
curl -s http://localhost/occm/api/users -X POST --header "Content-
Type:application/json" --data "{ \"firstName\": \"kuki\", \"lastName\":
\"puki\", \"email\": \"kuki@puki.net\", \"roleId\": \"%roleId%\",
\"tenantId\": \"%tenantId%\", \"password\": \"1234\", \"accessKey\":
\"someAwsAccessKey\", \"secretKey\": \"AWEKSA123ASDF\" }" --cookie
cookies.txt
```

Preparing to launch a Cloud ONTAP instance

When you launch a Cloud ONTAP instance, you must specify valid values for license type, AWS region, Cloud ONTAP version, and instance type. You can obtain valid values for your version of Cloud Manager by using the following API call:

```
curl http://localhost/occm/api/vsa/metadata/manifests -X
GET --header "Content-Type:application/json" --cookie cookies.txt
```

Note the following about the response for this API:

- For licenses, the type field displays valid values for the `licenseType` parameter.
- For regions, the code field displays valid values for the `region` parameter.
- For Cloud ONTAP versions, the valid values for the `ontapVersion` parameter display underneath the version of Cloud Manager that you are running.
- For instance types, the valid values for the `instanceType` parameter display underneath each license type.

You must also identify the target VPC and subnet before you can launch a Cloud ONTAP instance. The following API call provides the target VPC ID and subnet ID in a specific region:

```
curl http://localhost/occm/api/vsa/metadata/vpcs?region=%region% -X
GET --header "Content-Type:application/json" --cookie cookies.txt | jq .
```

Launching a Cloud ONTAP instance

The following operation launches a Cloud ONTAP instance:

```
curl http://localhost/occm/api/vsa/working-environments -X POST --cookie
cookies.txt --header "Content-Type:application/json" --data "{\"name\":
\"kuki\", \"tenantId\": \"%tenantId%\", \"region\": \"%region%\",
\"subnetId\": \"%subnetId%\", \"ebsVolumeType\": \"gp2\", \"ebsVolumeSize\":
{ \"size\": 500, \"unit\": \"GB\" }, \"dataEncryptionType\": \"NONE\",
\"ontapEncryptionParameters\": null, \"svmPassword\": \"%svmPassword%\",
\"vpcId\": \"%vpcId%\", \"vsaMetadata\": { \"platformLicense\": null,
\"ontapVersion\": \"ONTAP-8.3.1.T2\", \"licenseType\": \"cot-standard-paygo
\", \"instanceType\": \"m3.2xlarge\" } }"
```

Note: The preceding example does not specify a license or a volume.

To monitor the creation of the instance, you can use the following API call:

```
curl http://localhost/occm/api/vsa/working-environments -X GET --header
"Content-Type:application/json" --cookie cookies.txt | jq -r
.[0].publicId > vsaId.txt
set /p weid=<vsaId.txt
```

After the Cloud ONTAP instance is up and running, you can use the following API call to get details about the instance:

```
curl "http://localhost/occm/api/vsa/working-environments?fields=status,
awsProperties,reservedSize,encryptionProperties,ontapProperties,
actionsRequired,cronJobSchedules,snapshotPolicies,svms,activeActions,
interClusterLifs,replicationProperties&tenantId=%tenantId%" -X GET
--header "Content-Type:application/json" --cookie cookies.txt
```

A sample response follows:

```
{
  "id": "VsaWorkingEnvironment-UU72AEtE",
  "status": "ON",
  "lifs": [
    {
      "ip": "4.4.4.4",
      "netmask": "mgmt",
      "lifType": "Node Management",
      "dataProtocols": []
    },
    {
      "ip": "10.20.1.2",
      "netmask": "data",
      "lifType": "Node Management",
      "dataProtocols": []
    },
    {
      "ip": "10.20.1.1",
      "netmask": "data",
      "lifType": "Cluster Management",
      "dataProtocols": []
    },
    {
      "ip": "10.20.1.6",
      "netmask": "data",
      "lifType": "Intercluster",
      "dataProtocols": []
    },
    {
      "ip": "10.20.1.4",
      "netmask": "data",
      "lifType": "Data",
      "dataProtocols": ["iscsi"]
    },
    {
      "ip": "10.20.1.5",
      "netmask": "data",
      "lifType": "Data",
      "dataProtocols": ["nfs", "cifs"]
    },
    {
      "ip": "10.20.1.7",
      "netmask": "mgmt",
      "lifType": "SVM Management",
      "dataProtocols": []
    }
  ],
  "serialNumber": "serial-vsa1",
  "systemId": "system-id-vsa1",
  "clusterName": "vsa1",
  "ontapVersion": "8.3.1RC1",
  "accountId": "account123",
  "productCode": "",
  "amiId": "ami-7731c31c",
  "systemManagerUrl": "https://10.20.1.1/sysmgr/SysMgr.html",
  "creationTime": 1388527200000,
  "instanceId": "i-1",
  "platformLicense": "",
  "licenseExpiryDate": 0,
  "instanceType": "m3.2xlarge",
  "publicIp": null,
  "publicDnsName": null,
  "activeActions": null,
  "licenseType": {
    "name": "Cloud ONTAP Standard",
    "capacityLimit": {
      "size": 10.0,
      "unit": "TB"
    }
  },
  "vsaEncryptionResponse": {
    "awsVolumeEncryption": false,
    "keyManagers": []
  },
  "ontapEncryption": false,
  "ontapEncryptionCertificates": []
}
```

You should make note of the working environment ID because you must specify it when performing subsequent operations on the working environment.

Creating an aggregate for Cloud ONTAP

Use the following API call to create a new aggregate on a Cloud ONTAP system:

```
curl http://localhost/occm/api/vsa/aggregates -X POST --header "Content-Type:application/json" --data '{"name": "aggr33", "workingEnvironmentId": "%weid%", "numberOfDisks": "2", "diskSize": {"size": "500", "unit": "GB"}}' --cookie cookies.txt
```

After Cloud Manager creates the aggregate, you can use the following API call to get details about it:

```
curl http://localhost/occm/api/vsa/aggregates?workingEnvironmentId=%weid% -X GET --header "Content-Type:application/json" --cookie cookies.txt
```

Creating a Cloud ONTAP volume

The first API call in the following example gets the Storage Virtual Machine (SVM) name to specify when creating the volume. The second API call gets the required number of disks and the aggregate name in which to create the volume. The third API call creates a new volume on a Cloud ONTAP system using the public ID of the working environment, which was returned after Cloud Manager created the working environment.

Note: If `aggregateName` and `maxNumOfDisksApprovedToAdd` are not specified, then the response fails with a suggested aggregate name and the number of disks that Cloud Manager needs to create to fulfill the request.

```
curl http://localhost/occm/api/vsa/working-environments/%weid% -X GET
--header "Content-Type:application/json" --cookie cookies.txt |
jq -r .svmName > svm.txt
set /p svm=<svm.txt
curl http://localhost/occm/api/vsa/volumes/quote -X POST --header
"Content-Type:application/json" --data "{\"workingEnvironmentId\":
\"%weid%\", \"svmName\": \"%svm%\", \"aggregateName\": \"aggr33\",
\"name\": \"newVol\", \"size\": {\"size\": \"100\", \"unit\": \"GB\"},
\"enableThinProvisioning\": \"true\"}" --cookie cookies.txt > quote.txt
type quote.txt | jq -r .numOfDisks > disks.txt
type quote.txt | jq -r .aggregateName > aggrName.txt
set /p disks=< disks.txt
set /p aggrName=< aggrName.txt
curl http://localhost/occm/api/vsa/volumes -X POST --header "Content-Type:
application/json" --data "{\"name\": \"newVol\", \"workingEnvironmentId\":
\"%weid%\", \"svmName\": \"%svm%\", \"exportPolicyInfo\": {\"policyType\":
\"custom\", \"ips\": [\"0.0.0.0/0\"]}, \"snapshotPolicyName\": \"default\",
\"size\": {\"size\": \"100\", \"unit\": \"GB\"}, \"enableThinProvisioning\":
\"true\", \"enableDeduplication\": \"true\", \"enableCompression\":
\"false\", \"maxNumOfDisksApprovedToAdd\": \"%disks%\", \"aggregateName\":
\"%aggrName%\"}" --cookie cookies.txt
```

Stopping a Cloud ONTAP instance

The following operation stops a Cloud ONTAP instance in AWS:

```
curl http://localhost/occm/api/vsa/working-environments/%weid%/stop?
take_snapshots=true -X POST --header "Content-Type:application/json"
--cookie cookies.txt
```

Starting a Cloud ONTAP instance

The following operation starts a Cloud ONTAP instance in AWS:

```
curl http://localhost/occm/api/vsa/working-environments/%weid%/start
-X POST --header "Content-Type:application/json" --cookie cookies.txt
```

Deleting a Cloud ONTAP working environment

The following API call deletes a Cloud ONTAP working environment, which terminates the instance in AWS:

```
curl http://localhost/occm/api/vsa/working-environments/%weid% -X DELETE
--header "Content-Type:application/json" --cookie cookies.txt
```

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