

# Oracle ZFS Storage Appliance Object API Guide for Oracle Cloud Infrastructure Object Storage Service Support, Release OS8.8.x



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Oracle ZFS Storage Appliance Object API Guide for Oracle Cloud Infrastructure Object Storage Service Support, Release OS8.8.x,

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# 1

## Oracle ZFS Storage Appliance Object API for Oracle Cloud Infrastructure Object Storage

Oracle ZFS Storage Appliance object API for Oracle Cloud Infrastructure Object Storage enables you to use the same applications both on-premises on Oracle ZFS Storage Appliance and in the cloud on Oracle Cloud Infrastructure Object Storage. Applications that are written to store content on Oracle Cloud Infrastructure Object Storage can also be used to store content on Oracle ZFS Storage Appliance on-premises with no modification of the application.

The appliance API for Oracle Cloud Infrastructure objects supports a subset of the Oracle Cloud Infrastructure Object Storage API, as described in [Supported Oracle Cloud Infrastructure Object Storage API Capabilities](#).

This guide describes the following steps to configure Oracle Cloud Infrastructure Object Storage on an appliance:

- Enable the Oracle Cloud Infrastructure Object Storage service.
- Create and upload a user's key for signature authentication.

Create an RSA-SHA256 private/public key pair for each user, and then upload the public key to the appliance.

Each request contains a signature that is generated from the private key used by the client and authenticated with the public key on the appliance. For more information, see [Required Keys and OCIDs](#).

- Configure the service for specific projects and filesystems.

Define an appliance filesystem to be used as an endpoint to store objects. Enable the Oracle Cloud Infrastructure HTTP protocol as read/write.

## Using the Oracle Cloud Infrastructure Object Storage Service

See the following topics to configure an appliance to operate on Oracle Cloud Infrastructure Object Storage objects:

- Enabling the Oracle Cloud Infrastructure Object Storage Service - [BUI](#), [CLI](#)
- Managing Oracle Cloud Infrastructure Object Storage Service User Keys - [BUI](#), [CLI](#)
- Configuring the Oracle Cloud Infrastructure Object Storage Service - [BUI](#), [CLI](#)
- [Oracle ZFS Storage Appliance RESTful API Support for the Oracle Cloud Infrastructure Object Storage Service](#)

## Enabling the Oracle Cloud Infrastructure Object Storage Service (BUI)

This procedure describes how to use the BUI to enable the Oracle Cloud Infrastructure Object Storage service for the HTTP protocol.

1. From the **Configuration** menu, select **Services**.

2. Under **Data Services**, click **HTTP**.
3. Click the **OCI** tab.
4. In the **OCI API** section, click the **Enable OCI** check box to enable the Oracle Cloud Infrastructure Object Storage service for the HTTP protocol.

If the **Enable OCI** check box is checked, clicking the check box disables the service.

5. Click **APPLY**.
6. Verify the **Default path** property value.

The **Default path** property specifies the default location to store your objects. This default path is used if you do not specify the location for an object when you use the Oracle Cloud Infrastructure object store.

The value of this property is the mountpoint of a filesystem that has the OCI API mode set to Read/write as described in [Configuring the Oracle Cloud Infrastructure Object Storage Service \(BUI\)](#).

## Enabling the Oracle Cloud Infrastructure Object Storage Service (CLI)

This procedure describes how to use the CLI to enable the Oracle Cloud Infrastructure Object Storage service for the HTTP protocol.

1. Go to the `oci` node of the HTTP service.

```
hostname:> configuration services http oci
```

2. Optional: List the properties of the `oci` node.

```
hostname:configuration services http oci> ls
Properties:
    oci_enabled = false
    oci_default_path = /export/fs1
```

Children:

```
keys => Manage this Keystore's Keys
```

3. To enable the Oracle Cloud Infrastructure Object Storage service for the HTTP protocol, set the `oci_enabled` property to true.

```
hostname:configuration services http oci> set oci_enabled=true
oci_enabled = true (uncommitted)
```

4. Commit the change.

```
hostname:configuration services http oci (uncommitted)> commit
```


5. Verify the `oci_default_path` property value.

The `oci_default_path` property specifies the default location to store your objects. This default path is used if you do not specify the location for an object when you use the Oracle Cloud Infrastructure object store.

The value of this property is the mountpoint of a filesystem that has the `shareoci` property set to `rw` as described in [Configuring the Oracle Cloud Infrastructure Object Storage Service \(CLI\)](#).

## Managing Oracle Cloud Infrastructure Object Storage Service User Keys (BUI)

This procedure describes how to use the BUI to create a user key, set operations permissions for a user key, or delete a user key for the Oracle Cloud Infrastructure Object Storage service for the HTTP protocol.

1. From the **Configuration** menu, select **Services**.
2. Under **Data Services**, click **HTTP**.
3. Click the **OCI** tab.
4. Click the add icon  next to **Keys** to create a new user key.
  - a. In the **New Key** dialog box, enter a user name, a public key, and an optional comment.

The user name is the OCID of an Oracle Cloud Infrastructure account user and is also a valid data user on the appliance. A data user is a user that is allowed to access data protocols. The user does not need to be an appliance administrator.


The public key is a 392-character base64 string that corresponds to an RSA public key in PEM format.


- b. Click **ADD**.

The **Keys** list displays the generated fingerprint for the new key.

- A unique fingerprint is generated for each different key that is entered by the same user.
  - The same fingerprint is generated for a key that is entered by different users.
5. Optional: Change operations permissions for a user key.

Permissions control a user's ability to perform operations on resources. For more information, see [Permissions Required for Each API Operation](#).

- a. Hover over the entry for the key that you want to change, and click the edit icon  .

The **Edit Key Permissions** dialog box opens.
  - b. In the **Edit Key Permissions** dialog box, check the box to the left of each permission that you want enabled for this user key.
  - c. Click **OK**.
6. To delete a key, hover over the entry for the key you want to delete, and click the trash icon  .

## Managing Oracle Cloud Infrastructure Object Storage Service User Keys (CLI)

This procedure describes how to use the CLI to create a user key, set operations permissions for a user key, or delete a user key for the Oracle Cloud Infrastructure Object Storage service for the HTTP protocol.

1. Go to the `oci keys` node of the HTTP service.

```
hostname:> configuration services http oci keys
hostname:configuration services http oci keys> list
NAME      CREATED          USER  FINGERPRINT      COMMENT
key-000  2019-6-19 15:25:42  usr1  key-000-fingerprint
key-001  2019-7-8 16:01:18  usr2  key-001-fingerprint
```

2. Use the `create` command to create a new user key.

```
hostname:configuration services http oci keys> create
```

Provide a user name, a public key, and an optional comment.

- a. Set the user name.

The user name is the OCID of an Oracle Cloud Infrastructure account user and is also a valid data user on the appliance. A data user is a user that is allowed to access data protocols. The user does not need to be an appliance administrator.

```
hostname:configuration services http oci key-002 (uncommitted)> set
user=usr3
                                user = usr3 (uncommitted)
```

- b. Use the `setkey` command to set the key.

The public key is a 392-character base64 string that corresponds to an RSA public key in PEM format. The key is echoed in correct PEM format for visual verification.

```
hostname:configuration services http oci key-002 (uncommitted)> setkey
("." to end)> -----BEGIN PUBLIC KEY-----
("." to end)>
MIIBITANBgkqhkiG9w0BAQEFAAOCAQ4AMIIBCQKCAQBqm2f5LPGIe9Nc6QiA+1Sb
("." to end)> ...
("." to end)> Bg/
rj3IO97yXax+18hIwCI6uNzgye7bUSQF6BNyEuNazW8VbCJPwnTdbWknKoSXh
("." to end)> AgMBAAEa
("." to end)> -----END PUBLIC KEY-----
("." to end)> .
```

3. Optional: Provide a comment.

```
hostname:configuration services http oci key-002 (uncommitted)> set
comment=dev
                                comment = dev (uncommitted)
```

4. Commit the changes.

```
hostname:configuration services http oci key-002 (uncommitted)> commit
Here is the fingerprint associated with the registered public key.
```

```
Fingerprint: key-002-fingerprint
```

The `Keys` list displays the generated fingerprint for the new key.

- A unique fingerprint is generated for each different key that is entered by the same user.
  - The same fingerprint is generated for a key that is entered by different users.
5. Optional: Change operations permissions for a user key.

Permissions control a user's ability to perform operations on resources. See the [Permissions Required for Each API Operation](#) for more information.



a. Select a key.

A specific key can be selected in either of the following ways:

- By key name, such as `key-000`.
- By both username and fingerprint. A username or a fingerprint could match more than one key. Even if the username or fingerprint is unique in the current configuration, you must specify both to select the key.

To select a key, use one of the following commands:

```
hostname:configuration services http oci keys> select keyname
OR
hostname:configuration services http oci keys> select user=username
fingerprint=fingerprint
```

Select the new key and show its permissions properties.

```
hostname:configuration services http oci keys> select key-002
hostname:configuration services http oci key-002> ls
Properties:
```

```
        user = usr3
        fingerprint = key-002-fingerprint
        comment = dev
        namespace_read = true
        bucket_create = true
        bucket_update = true
        bucket_read = true
        bucket_inspect = true
        bucket_delete = true
        object_create = true
        object_overwrite = true
        object_read = true
        object_inspect = true
        object_delete = true
        object_version_delete = true
        par_manage = true
        retention_rule_manage = true
        retention_rule_lock = true
```

b. Disable or enable specific permissions.

The following example disables the `object_version_delete` permission for the selected key.

```
hostname:configuration services http oci key-002> set
object_version_delete=false
        object_version_delete = false (uncommitted)
```

c. Commit the changes.

```
hostname:configuration services http oci key-002> commit
hostname:configuration services http oci key-002> get object_version_delete
        object_version_delete = false
hostname:configuration services http oci key-002> done
```

6. To delete a key, use the `destroy` command.

Enter `destroy keyname` , and then enter `y` to confirm the key deletion.



```
hostname:configuration services http oci keys> destroy key-000
This will delete key "key-000". Are you sure? (Y/N) y
```

## Configuring the Oracle Cloud Infrastructure Object Storage Service (BUI)

To configure the Oracle Cloud Infrastructure Object Storage service, enable the Oracle Cloud Infrastructure HTTP protocol as read/write for a filesystem. A filesystem that has the Oracle Cloud Infrastructure HTTP protocol enabled as read/write can be specified as the default namespace used by clients that access the object storage service and do not specify a namespace. See the **Default path** field in [Enabling the Oracle Cloud Infrastructure Object Storage Service \(BUI\)](#).

### Note:

OCI API mode can be enabled only if no other share mode is enabled. If OCI API mode is enabled, no other share mode can be enabled. OCI API mode cannot be disabled once it has been enabled.

1. Go to the **Shares** menu.  
You can configure a project and then set the filesystems to inherit that configuration, or you can configure individual filesystems.
2. Optional: Configure a project.
  - a. Click the **Projects** tab.
  - b. Hover over the entry for the project that you want to configure, and click the edit icon .
  - c. Click the **Protocols** tab.
  - d. Under **HTTP**, set the **OCI API mode** to **Read/write**.
  - e. Click **APPLY**.
3. Configure a filesystem.
  - a. Click the **Filesystems** tab.
  - b. Hover over the entry for the filesystem that you want to configure, and click the edit icon .
  - c. Click the **Protocols** tab.
  - d. Under **HTTP**, set the **OCI API mode** to **Read/write**.

Use one of the following methods to specify the OCI API mode:

- If you performed this configuration on the parent project, click the **Inherit from project** check box.

Verify that the value of the **OCI API mode** is **Read/write**.

### Note:

If the **Inherit from project** check box is checked, then all of the HTTP modes inherit properties from the parent project.

- If you did not perform this configuration on the parent project, set the **OCI API mode** to **Read/write**.

Verify that the **Inherit from project** check box is not checked.

Click the **OCI API mode** dropdown menu and select **Read/write**.

 **Note:**

If the **Inherit from project** check box is not checked, then none of the HTTP modes inherit properties from the parent project.

- e. Click **APPLY**.

## Configuring the Oracle Cloud Infrastructure Object Storage Service (CLI)

To configure the Oracle Cloud Infrastructure Object Storage service, set the `shareoci` property to read/write for a filesystem. A filesystem that has the `shareoci` property set to read/write can be specified as the default namespace used by clients that access the object storage service and do not specify a namespace. See the `oci_default_path` property in [Enabling the Oracle Cloud Infrastructure Object Storage Service \(CLI\)](#).

 **Note:**

OCI API mode can be enabled only if no other share mode is enabled. If OCI API mode is enabled (the `shareoci` property is set to read/write for a filesystem), no other share mode can be enabled. OCI API mode cannot be disabled once it has been enabled.

1. Go to `shares`.

You can configure a project and then set the filesystems to inherit that configuration, or you can configure individual filesystems.

By default, shares inherit all of their properties from their parent project. If a property is changed on a project, all shares on which that property has not been set locally are updated to reflect the new value.

2. Optional: Configure a project.

- a. Select the parent project of the filesystem that you want to configure.

```
hostname:shares (pool1)> select default
```

- b. Show the value of the `shareoci` property.

```
hostname:shares (pool1) default> get shareoci  
shareoci = off
```

If the value of the `shareoci` property is `rw`, stop, you are finished.

- c. Set the `shareoci` property to `rw`.

```
hostname:shares (pool1) default> set shareoci=rw  
shareoci = rw (uncommitted)
```

- d. Commit the change.

```
hostname:shares (pool1) default> commit
```

3. Configure a filesystem.

- a. Select the filesystem that you want to configure.

```
hostname:shares (pool1) default> select fs1
```

- b. Show the value of the `shareoci` property.

```
hostname:shares default/fs1> get shareoci
shareoci = off
```

If the value of the `shareoci` property is `rw`, stop, you are finished.

- c. Set the `shareoci` property to `rw`.

```
hostname:shares default/fs1> set shareoci=rw
shareoci = rw (uncommitted)
```

- d. Commit the change.

```
hostname:shares default/test1> commit
```

## Oracle ZFS Storage Appliance RESTful API Support for the Oracle Cloud Infrastructure Object Storage Service

The following RESTful API requests support the Oracle Cloud Infrastructure Object Storage service.

**Table 1-1 RESTful API `services` Commands to Support the Oracle Cloud Infrastructure Object Storage Service**

Request	Append to Path <code>/api/service/v2/services</code>	Description
GET	<code>/http</code>	List <code>http</code> service and sub-service details.
GET	<code>/http/oci</code>	List the Oracle Cloud Infrastructure service details.
PUT	<code>/http/oci</code>	Modify the Oracle Cloud Infrastructure service.
GET	<code>/http/oci/keys</code>	List all Oracle Cloud Infrastructure public keys.
POST	<code>/http/oci/keys</code>	Create a new Oracle Cloud Infrastructure public key.
GET	<code>/http/oci/keys/user/fingerprint</code>	List the specified Oracle Cloud Infrastructure public key.
DELETE	<code>/http/oci/keys/user/fingerprint</code>	Delete the specified Oracle Cloud Infrastructure public key.

**Table 1-2 RESTful API `pools` Commands to Support the Oracle Cloud Infrastructure Object Storage Service**

Request	Append to Path <code>/api/storage/v2/pools</code>	Description
GET	<code>/pool/projects/project</code>	List project details, including the value of the <code>shareoci</code> property.
GET	<code>/pool/projects/project/filesystems/filesystem</code>	List filesystem details, including the value of the <code>shareoci</code> property.

**Table 1-2 (Cont.) RESTful API `pool`s Commands to Support the Oracle Cloud Infrastructure Object Storage Service**

Request	Append to Path <code>/api/storage/v2/pools</code>	Description
PUT	<code>/pool/projects/project</code>	Set the <code>shareoci</code> property for the specified project.
PUT	<code>/pool/projects/project/filesystems/filesystem</code>	Set the <code>shareoci</code> property for the specified filesystem.

## List Oracle Cloud Infrastructure Service Details

The following example lists all properties and sub-services of the HTTP service.

Example Request:

```
GET /api/service/v2/services/http
```

Example Result:

Some details are omitted from the following output.

```
{
  "service": {
    "href": "/api/service/v2/services/http",
    ...
    "oci": {
      "href": "/api/service/v2/services/http/oci",
      "oci_enabled": false,
      "oci_default_path": "",
      "keys": [ ... ]
    },
    "s3": { ... },
    "swift": { ... },
    "webdav": { ... }
  }
}
```

The following example lists all properties of the HTTP Oracle Cloud Infrastructure service.

Example Request:

```
GET /api/service/v2/services/http/oci
```

Example Result:

```
{
  "oci": {
    "href": "/api/service/v2/services/http/oci",
    "oci_enabled": false,
    "oci_default_path": "",
    "keys": [
      {
        "user": "user1",
        "comment": "comment",
        "fingerprint": "fingerprint1",
        "href": "/api/service/v2/services/http/oci/keys/user1/fingerprint1"
      },
      {

```

```

        "user": "user2",
        "comment": "comment"
        "fingerprint": "fingerprint2",
        "href": "/api/service/v2/services/http/oci/keys/user2/fingerprint2"
    }
  ]
}

```

## Enable the Oracle Cloud Infrastructure Service

### Example Request:

```
PUT /api/service/v2/services/http/oci
```

```
{ "oci_enabled": true }
```

### Example Result:

```

{
  "oci": {
    "href": "/api/service/v2/services/http/oci",
    "oci_enabled": true,
    "oci_default_path": "",
    "keys": [ ... ]
  }
}

```

The `oci_default_path` property specifies the default location to store your objects. This default path is used if you do not specify the location for an object when you use the Oracle Cloud Infrastructure object store.

The value of this property is the mountpoint of a filesystem that has the `shareoci` property set to `rw` as described in [Set the Oracle Cloud Infrastructure Default Path](#).

## List Oracle Cloud Infrastructure Keys

The following example lists all Oracle Cloud Infrastructure keys.

### Example Request:

```
GET /api/service/v2/services/http/oci/keys
```

### Example Result:

```

"keys": [
  {
    "user": "user1",
    "comment": "comment"
    "fingerprint": "fingerprint1",
    "href": "/api/service/v2/services/http/oci/keys/user1/fingerprint1"
  },
  {
    "user": "user2",
    "comment": "comment"
    "fingerprint": "fingerprint2",
    "href": "/api/service/v2/services/http/oci/keys/user2/fingerprint2"
  }
]

```

The following example lists the specified Oracle Cloud Infrastructure key.

**Example Request:**

```
GET /api/service/v2/services/http/oci/user2/fingerprint2
```

**Example Result:**

```
{
  "key": {
    "user": "user2",
    "comment": "comment",
    "fingerprint": "fingerprint2",
    "href": "/api/service/v2/services/http/oci/keys/user2/fingerprint2"
  }
}
```

## Create a New Oracle Cloud Infrastructure User Key

To create a new user key, enter a user name, a public key, and an optional comment.

The user name is the OCID of an Oracle Cloud Infrastructure account user and is also a valid data user on the appliance. A data user is a user that is allowed to access data protocols. The user does not need to be an appliance administrator.

The public key is a 392-character base64 string that corresponds to an RSA public key in PEM format.

A unique fingerprint is generated for each different key that is entered by the same user.

The same fingerprint is generated for a key that is entered by different users, as shown in the following example.

**Example Request:**

```
POST /api/service/v2/services/http/oci/keys
```

```
{
  "user": "user3",
  "key": "-----BEGIN PUBLIC KEY-----\nkey2-text\n-----END PUBLIC KEY-----",
  "comment": "comment"
}
```

**Example Result:**

```
{
  "key": {
    "user": "user3",
    "comment": "comment",
    "fingerprint": "fingerprint2",
    "href": "/api/service/v2/services/http/oci/keys/user3/fingerprint2"
  }
}
```

## Change Operations Permissions for an Oracle Cloud Infrastructure User Key

Permissions control a user's ability to perform operations on resources. See the [Permissions Required for Each API Operation](#) for more information.

If a user attempts to perform an operation using a key that does not grant permission for that operation, HTTP status 401 (Unauthorized) is returned.

The following request shows the operations permissions for an Oracle Cloud Infrastructure user key.

**Example Request:**

```
GET /api/service/v2/services/http/oci/keys/user3/fingerprint2
```

**Example Result:**

```
{
  "key": {
    "href": "/api/service/v2/services/http/oci/keys/user3/fingerprint2",
    "user": "user3",
    "fingerprint": "fingerprint2",
    "comment": "",
    "namespace_read": true,
    "bucket_create": true,
    "bucket_update": true,
    "bucket_read": true,
    "bucket_inspect": true,
    "bucket_delete": true,
    "object_create": true,
    "object_overwrite": true,
    "object_read": true,
    "object_inspect": true,
    "object_delete": true,
    "object_version_delete": true,
    "par_manage": true,
    "retention_rule_manage": true,
    "retention_rule_lock": true
  }
}
```

The following example disables the `object_delete` and `object_version_delete` permissions for the `user3/fingerprint2` key.

**Example Request:**

```
PUT /api/service/v2/services/http/oci/keys/user3/fingerprint2
```

```
{"object_delete": false, "object_version_delete": false}
```

**Example Result:**

```
{
  "key": {
    "href": "/api/service/v2/services/http/oci/keys/user3/fingerprint2",
    "user": "user3",
    "fingerprint": "fingerprint2",
    "comment": "",
    "namespace_read": true,
    "bucket_create": true,
    "bucket_update": true,
    "bucket_read": true,
    "bucket_inspect": true,
    "bucket_delete": true,
    "object_create": true,
    "object_overwrite": true,
    "object_read": true,
  }
}
```



```

    "object_inspect": true,
    "object_delete": false,
    "object_version_delete": false,
    "par_manage": true,
    "retention_rule_manage": true,
    "retention_rule_lock": true
  }
}

```

## Delete an Oracle Cloud Infrastructure User Key

Example Request:

```
DELETE /api/service/v2/services/http/oci/user2/fingerprint2
```

## Set the Oracle Cloud Infrastructure Default Path

The default path is used by clients that access the object storage service and do not specify a namespace. See the `oci_default_path` property in [Enable the Oracle Cloud Infrastructure Service](#). The value of the `oci_default_path` property is the mountpoint of a filesystem that has the `shareoci` property set to `rw`.

You can set the `shareoci` property on a project or on a filesystem. The `shareoci` property setting on a project is inherited by all child filesystems unless you explicitly set the property on the filesystem.



### Note:

OCI API mode can be enabled only if no other share mode is enabled. If OCI API mode is enabled (the `shareoci` property is set to read/write for a filesystem), no other share mode can be enabled. OCI API mode cannot be disabled once it has been enabled.

The following example shows the value of the `shareoci` property on the `proj1` project.

Example Request:

```
GET /api/storage/v2/pools/p1/projects/proj1 HTTP/1.1
```

Example Result:

```

{
  "project": {
    ...
    "shareoci": "off",
    ...
  }
}

```

The following example shows the value of the `shareoci` property on the `f1` filesystem.

Example Request:

```
GET /api/storage/v2/pools/p1/projects/proj1/filesystems/f1 HTTP/1.1
```

Example Result:

```
{
  "filesystem": {
    ...
    "shareoci": "off",
    ...
  }
}
```

The following example sets the value of the `shareoci` property on the `f1` filesystem.

**Example Request:**

```
PUT /api/storage/v2/pools/p1/projects/proj1/filesystems/f1 HTTP/1.1
{ "shareoci": "rw" }
```

**Example Result:**

```
{
  "filesystem": {
    ...
    "shareoci": "rw",
    ...
  }
}
```

## Supported Oracle Cloud Infrastructure Object Storage API Capabilities

The following tables describe the supported Oracle Cloud Infrastructure Object Storage API capabilities for Oracle ZFS Storage Appliance.

The appliance API for Oracle Cloud Infrastructure objects supports a subset of the Oracle Cloud Infrastructure Object Storage API. For full details about Oracle Cloud Infrastructure Object Storage API, including paths, complete descriptions of the requests, descriptions of the parameters, descriptions of all response codes, and examples, see [Object Storage Service API](#). For an overview, see [Overview of Object Storage](#).



**Note:**

No interoperability is supported between Oracle Cloud Infrastructure object APIs and Amazon S3 or Swift object APIs.

### Listing Namespaces

A namespace is a unique, uneditable, system-generated string assigned to a tenant during account creation.

Request	Path	Description	Normal Response Code
GET	/n/	( <a href="#">GetNamespace</a> ) Lists the name of the Object Storage namespace for the user making the request.	200
GET	/n/namespaceName	( <a href="#">GetNamespaceMetadata</a> ) Lists the metadata for the specified Object Storage namespace.	200

## Managing Buckets

A bucket is a container for storing objects.

Request	Append to Path /n/namespaceName	Description	Normal Response Code
GET	/b/	( <a href="#">ListBuckets</a> ) Lists all buckets that are on the specified namespace.	200
GET	/b/bucketName/	( <a href="#">GetBucket</a> ) Gets the specified bucket.	200
HEAD	/b/bucketName/	( <a href="#">HeadBucket</a> ) Gets the current entity tag (ETag) of the specified bucket.	200
POST	/b/	( <a href="#">CreateBucket</a> ) Creates a standard or archive bucket. No difference for Oracle ZFS Storage Appliance.	200
POST	/b/bucketName/	( <a href="#">UpdateBucket</a> ) Updates the user-defined metadata of the specified bucket.	200
DELETE	/b/bucketName/	( <a href="#">DeleteBucket</a> ) Deletes an empty bucket.	204

## Managing Objects

An object is a set of data with associated metadata.

Request	Append to Path /n/namespaceName	Description	Normal Response Code
GET	/b/bucketName/o	( <a href="#">ListObjects</a> ) Lists the objects in the specified bucket.	200
GET	/b/bucketName/objectversions	( <a href="#">ListObjectVersions</a> ) Lists the object versions in the specified bucket.	200
GET	/b/bucketName/o/objectName	( <a href="#">GetObject</a> ) Gets the metadata and body of the specified object.	200
HEAD	/b/bucketName/o/objectName	( <a href="#">HeadObject</a> ) Gets the user-defined metadata and ETag for the specified object.	200

Request	Append to Path <i>/n/namespaceName</i>	Description	Normal Response Code
POST	<i>/b/bucketName/o/actions/copyObject</i>	( <a href="#">CopyObject</a> ) Creates a request to copy an object within a region or to another region.	200
PUT	<i>/b/bucketName/o/objectName</i>	( <a href="#">PutObject</a> ) Creates a new object or overwrites an existing object with the same name.	200
DELETE	<i>/b/bucketName/o/objectName</i>	( <a href="#">DeleteObject</a> ) Deletes an object.	204

## Multipart Upload

Individual parts of an object can be uploaded in parallel to reduce upload time.

Request	Append to Path <i>/n/namespaceName</i>	Description	Normal Response Code
GET	<i>/b/bucketName/u</i>	( <a href="#">ListMultipartUploads</a> ) Lists all the in-progress multipart uploads for the specified bucket.	200
GET	<i>/b/bucketName/u/objectName</i>	( <a href="#">ListMultipartUploadParts</a> ) Lists the parts of an in-progress multipart upload.	200
POST	<i>/b/bucketName/u</i>	( <a href="#">CreateMultipartUpload</a> ) Starts a new multipart upload to a specific object in the specified bucket.	200
POST	<i>/b/bucketName/u/objectName</i>	( <a href="#">CommitMultipartUpload</a> ) Commits a multipart upload, which involves checking part numbers and ETags of the parts, to create an aggregate object.	200
PUT	<i>/b/bucketName/u/objectName</i>	( <a href="#">UploadPart</a> ) Uploads a single part of a multipart upload.	200
DELETE	<i>/b/bucketName/u/objectName</i>	( <a href="#">AbortMultipartUpload</a> ) Aborts an in-progress multipart upload and deletes all parts that have been uploaded.	204

## Managing Pre-authenticated Requests

Pre-authenticated requests provide a way to let users access a bucket or an object without having their own credentials.

Request	Append to Path <i>/n/namespaceName</i>	Description	Normal Response Code
POST	<i>/b/bucketName/p/</i>	( <a href="#">CreatePreauthenticatedRequest</a> ) Creates a pre-authenticated request specific to the bucket.	200

Request	Append to Path <i>/n/namespaceName</i>	Description	Normal Response Code
DELETE	<i>/b/bucketName/p/parID</i>	( <a href="#">DeletePreauthenticatedRequest</a> ) Deletes the specified pre-authenticated request.	200
GET	<i>/b/bucketName/p/parID</i>	( <a href="#">GetPreauthenticatedRequest</a> ) Gets the specified pre-authenticated request.	200
GET	<i>/b/bucketName/p/</i>	( <a href="#">ListPreauthenticatedRequests</a> ) Lists pre-authenticated requests for the bucket.	200

## Managing Retention Rules

A retention rule specifies the length of time to retain data in a bucket.

Request	Append to Path <i>/n/namespaceName</i>	Description	Normal Response Code
POST	<i>/b/bucketName/retentionRules</i>	( <a href="#">CreateRetentionRule</a> ) Creates a new retention rule in the specified bucket.	200
DELETE	<i>/b/bucketName/retentionRules/retentionRuleId</i>	( <a href="#">DeleteRetentionRule</a> ) Deletes the specified rule.	204
GET	<i>/b/bucketName/retentionRules/retentionRuleId</i>	( <a href="#">GetRetentionRule</a> ) Get the specified retention rule.	200
GET	<i>/b/bucketName/retentionRules</i>	( <a href="#">ListRetentionRules</a> ) List the retention rules for the specified bucket.	200
PUT	<i>/b/bucketName/retentionRules/retentionRuleId</i>	( <a href="#">UpdateRetentionRule</a> ) Update the specified retention rule.	200