

Data transfer to Oracle Cloud Infrastructure

- Secure FTP, REST API, oci cli

... and other methods to transfer data to and from Oracle Cloud Infrastructure (OCI)

22 May 2024

High-level Architecture

On-premise environment

Source Location of files:
/tmp/data

On-premise hardware
(ex macOS laptop)

Firewall allow connections to port 22 –
Allowed by default on OCI
Must use ssh public and private key
pair



Port 22, 443

Oracle Cloud Infrastructure

Oracle Linux 8 compute instance
Destination Location of files:
/home/opc

Oracle Cloud Infrastructure

Windows Server 2022

Oracle Cloud Infrastructure

Object storage buckets



scp – Secure Copy from on-premise to Linux on OCI on public subnet

- This example will transfer a file named '/tmp/data/test22.txt' from on-premise to OCI /home/opc/
- Usage: `scp -i private-key source-file username@remote-host:/path-to-destination`
- Usage: `scp -i private-key username@remote-host:/path-to-source destination`
- Username for Oracle Cloud Infrastructure:
 - Username for Oracle Linux & Centos, username = opc
 - Username for Ubuntu, username = ubuntu
 - Username for [Red Hat](#), username = cloud-user
 - Username for Windows, username = opc
- Must use public and private [ssh keys](#) (public key stored in compute instance)
- Passphrase on private ssh key is optional
- scp works bi-directional: copy to cloud and/or copy to on-premise
- May also use tools such as [Filezilla](#) and [Cyberduck](#)

```
% scp -i private-key /tmp/data/test22.txt opc@<ip addr of target>:/home/opc/  
Enter passphrase for key 'private-key':  
test22.txt
```



Sftp – Secure File Transfer Protocol from on-premise to Linux on OCI on public subnet

- Usage: `sftp -i private-key opc@remote-host`
- This example will transfer a file named `/tmp/data/data` from on-premise to OCI `/home/opc/`
- Must use public and private [ssh keys](#) (public key stored in compute instance)
- Passphrase on private ssh key is optional
- SFTP work bi-directional and is setup automatically on Linux
- May also use tools such as [Filezilla](#) and [Cyberduck](#)
- Operating system user `'opc'` is required, and more users may be created.

```
% sftp -i priv-key opc@1 ...edited ...
Enter passphrase for key 'priv-key':
Connected to 1 ...edited ...
sftp> pwd
Remote working directory: /home/opc
sftp> ls
!documents  test22.txt
sftp> ls
data          data2          data3          priv-key
sftp> put data
Uploading data to /home/opc/data
data                               100%  57    0.3KB/s  00:00
sftp> ls
data          documents  test22.txt
sftp>
```



Sftp – Secure File Transfer Protocol from on-premise to Linux on OCI on private subnet (10.6.0.0)

- Usage: `sftp -i private-key opc@remote-host`
- Access to Compute instance on private subnet requires VPN to OCI, or [OCI Bastion service](#)
- Create Connection SSH forwarding connection
- Must use public and private [ssh keys](#) (public key stored in compute instance)
- Passphrase on private ssh key is optional
- SFTP work bi-directional
- Operating system user 'opc' is required, and more users may be created.

```
...edited out ... % sftp -i priv-key opc@1 ...edited out ...  
Enter passphrase for key 'priv-key':  
Connected to 13 ...edited out ...  
sftp> pwd  
Remote working directory: /home/opc  
sftp> ls  
!documents  test22.txt  
sftp> ls  
data          data2          data3          priv-key  
sftp> put data  
Uploading data to /home/opc/data  
data 100% 57 0.3KB/s 00:00  
sftp> ls  
data  documents  test22.txt  
sftp> |
```

Sftp – Secure File Transfer Protocol from on-premise to Windows server on OCI

- Usage: `sftp -i priv-key opc@ip-addr-of-destination`
- Enable [OpenSSH](#) on Windows Server on OCI
- Add [Firewall rule](#) in Windows Server on OCI to allow ssh/sftp (port 22)
- Create public key on Windows Server on OCI in `c:\Users\opc\.ssh\authorized_keys`
- This example will transfer a file named '/tmp/data/windata.txt' from on-premise to Windows Server 2022 on Destination folder on Windows on OCI: `C:\Users\opc\Documents`

...edited ...

% sftp -i priv-key opc@1

...edited ...

```
sftp> !ls
data                data2                data3                priv-key            windata.txt
sftp> put windata.txt
Uploading windata.txt to /C:/Users/opc/windata.txt
windata.txt                                100%    84    0.5KB/s    00:00
sftp> dir
3D Objects
AppData
Application Data
Contacts
Cookies
Desktop
Documents
Downloads
Favorites
Links
Local Settings
Music
My Documents
NTUSER.DAT
NTUSER.DAT5c76cbdb-8fc9-11eb-8234-000d3cc6d50e1 TM h1f
NTUSER.DAT...edited ...
NTUSER.DAT
NetHood
Pictures
PrintHood
Recent
Saved Games
Searches
SendTo
Start Menu
Templates
Videos
ntuser.dat.LOG1
```


Sftp – Secure File Transfer Protocol from on-premise to Windows server on OCI (Cont).

```

C:\Users\opc>dir
Volume in drive C is Windows
Volume Serial Number is B055-CF46

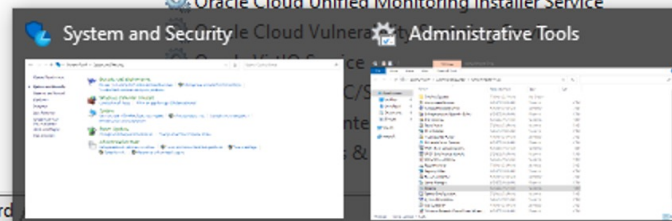
Directory of C:\Users\opc

04/20/2024  03:50 PM  <DIR>      .
04/20/2024  03:04 PM  <DIR>      ..
04/20/2024  03:39 PM  <DIR>      .ssh
04/20/2024  03:05 PM  <DIR>      3D Objects
04/20/2024  03:05 PM  <DIR>      Contacts
04/20/2024  03:27 PM  <DIR>      Desktop
04/20/2024  03:05 PM  <DIR>      Documents
04/20/2024  03:05 PM  <DIR>      Downloads
04/20/2024  03:05 PM  <DIR>      Favorites
04/20/2024  03:05 PM  <DIR>      Links
04/20/2024  03:05 PM  <DIR>      Music
04/20/2024  03:05 PM  <DIR>      Pictures
04/20/2024  03:05 PM  <DIR>      Saved Games
04/20/2024  03:05 PM  <DIR>      Searches
04/20/2024  03:05 PM  <DIR>      Videos
04/20/2024  03:50 PM                84 windata.txt
  
```

between two untrusted hosts over an insecure network.

- OpenSSH Authentication Agent
- OpenSSH SSH Server
- Optimize drives
- Oracle Cloud Agent
- Oracle Cloud Agent Cloud Guard Workload Protection
- Oracle Cloud Agent Run Command Service
- Oracle Cloud Agent Updater
- Oracle Cloud Block Storage Management Service
- Oracle Cloud Operating System Management Service
- Oracle Cloud Unified Monitoring Installer Service

Agent to ho...			
SSH protoc...	Running	Automatic	Local Syste...
Helps the c...		Manual	Local Syste...
Oracle Clou...	Running	Automatic	NT SERVIC...
Oracle Clou...	Running	Manual	NT SERVIC...
Oracle Clou...	Running	Manual	NT SERVIC...
Oracle Clou...	Running	Automatic	NT SERVIC...
Oracle Clou...		Manual	NT SERVIC...
Oracle Clou...	Running	Manual	NT SERVIC...
Oracle Clou...		Manual	NT SERVIC...
Oracle Clou...		Manual	NT SERVIC...
Oracle Virtl...	Running	Automatic	Local Syste...
Manages pa...		Disabled	Local Service
Enables rem...		Manual	Local Service
Performanc...		Manual	Local Service
Enables a c...	Running	Manual	Local Syste...





Other methods to transfer data to and from Oracle Cloud Infrastructure

[FileZilla](#) client using private ssh key

[Secure Copy \(scp\)](#) method

- Any to any: Windows to Linux, Linux to Linux
Requires public/private ssh key

[Rsync](#)

- Linux to Linux used to keep folders synchronized

[Robocopy](#) – Windows to Windows

[SFTPGo](#) – ftp GUI tool

[Cyberduck](#) – ftp GUI tool

[Curl using Oracle MOS Doc 2511612.1](#)

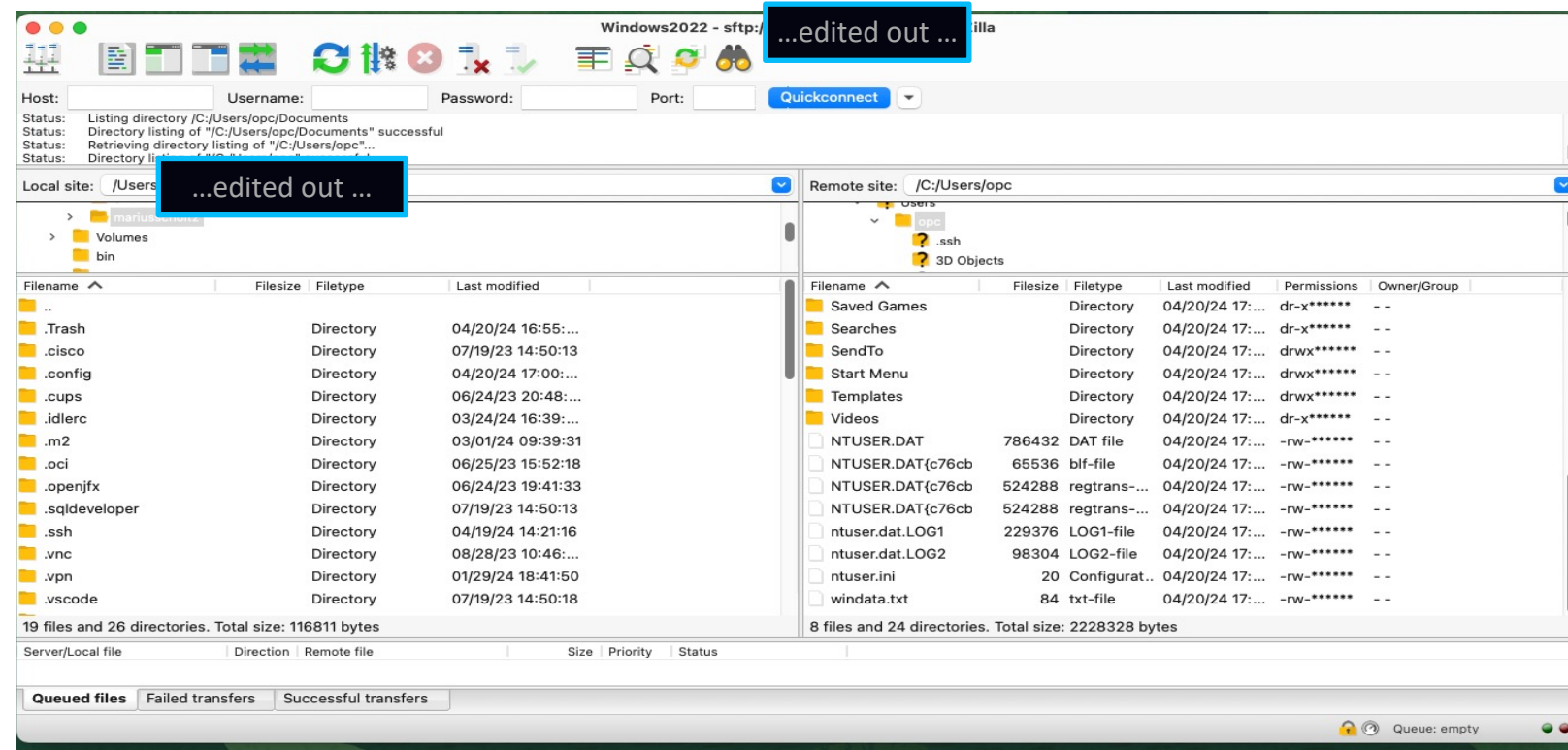
Requirements for OCI:

[User name/Password](#)



[Secret key](#)

[Access key](#) (Amazon S3 compatible)



Cyberduck example to access Object Storage on Oracle Cloud Infrastructure

[Cyberduck](#) using S3 (HTTPS) or Oracle OCI [profile](#)
To access Object Storage, you must have access to [Access key and Secret key](#)
Drag and drop data to and from OCI

S3 (HTTPS)

Nickname: marius-bucket1

Labels:

URL: <https://fr9qm0r9q44x.compat.objectstorage.com>

Server: fr9qm0r9q44x.compat.objects Port: 443

Access Key ID: 5bb1cd247

☐ Anonymous Login

Secret Access Key:

SSH Private Key: None

Client Certificate: None

More Options

Path: Folder

Web URL: <https://fr9qm0r9q44x.compat.objectstorage.com>

Download Folder: Downloads

Transfer Files: Default

Timezone: UTC

Encoding: Default

Connect Mode: Default

Notes: S3 HTTPS, public with new secret

OCI Object Storage (eu-frankfurt-1)

Nickname: Marius object storage on frankfurt

Labels:

URL: <https://fr9qm0r9q44x.compat.objectstorage.com>

Server: fr9qm0r9q44x.compat.objects Port: 443

Access Key:

☐ Anonymous Login

Secret Key:

SSH Private Key: None

Client Certificate: None

More Options

Path: Folder

Web URL: <https://fr9qm0r9q44x.compat.objectstorage.com>

Download Folder: Downloads

Transfer Files: Default

Timezone: UTC

Encoding: Default

Connect Mode: Default

Notes: with new secret again

Search docs

CYBERDUCK

Cyberduck

CYBERDUCK CLI

Command Line Interface (CLI)

Protocols

Amazon S3

Oracle Cloud Infrastructure

ORACLE

Marius object storage on frankfurt

@fr9qm...

Open Connection

Action

Refresh

Edit

Search

Search

Disconnect

Marius object storage on frankfurt

/marius-bucket1

Filename	Size	Modified
CentOS79-64bit.vmdk	6.5 GB	2022/08/08, 20:54
cuberduck-readme.txt	1.4 KB	2022/03/07, 10:20
rhel8-kvm-qcow2rhel-8.8-x86_64-kvm.qcow2	926.8 MB	2023/11/11, 15:25



structure

How to access OCI Object Storage using Swift Endpoints using API/Curl? ([Doc ID 2511612.1](#))

Customers can use the below syntax to access OCI Objects Storage using Swift API using Curl. For security, the [username and auth token](#) is required.

USAGE:

```
$ curl -u 'user name:Auth token' -v https://swiftobjectstorage.eu-frankfurt-1.oraclecloud.com/v1/YYYY/YYYY
```

Where YYYY is the storage name space, and ZZZZ is bucket

To list Objects in a bucket (example bucket used residing in Frankfurt)

```
curl -u 'OracleIdentityCloudService/username:Auth-token' -v https://swiftobjectstorage.eu-frankfurt-1.oraclecloud.com/v1/storage-namespace/bucket1
```

To download Objects in a bucket:

```
curl -u 'OracleIdentityCloudService/ username:Auth-token' -v -X GET https://swiftobjectstorage.eu-frankfurt-1.oraclecloud.com/v1 storage-namespace/bucket1/test22.txt -o test22.txt
```

To upload an Object:

```
curl -u 'OracleIdentityCloudService/ username:Auth-token' -v -X PUT https://swiftobjectstorage.eu-frankfurt-1.oraclecloud.com/v1 storage-namespace/bucket1/test23.txt --upload-file test23.txt
```

More Swift API [links](#):

<https://swiftobjectstorage.ca-toronto-1.oraclecloud.com>

<https://swiftobjectstorage.eu-frankfurt-1.oraclecloud.com>

<https://swiftobjectstorage.uk-london-1.oraclecloud.com>

<https://swiftobjectstorage.us-ashburn-1.oraclecloud.com>

<https://swiftobjectstorage.us-phoenix-1.oraclecloud.com>

Resources

Objects

Upload

More Actions

Search by prefix

<input type="checkbox"/>	Name	Last Modified	Size	Storage Tier	
<input type="checkbox"/>	<input type="checkbox"/> CentOS79-64bit.vmdk	Mon, Aug 8, 2022 at 18:54:47 UTC	6.07 GiB	Standard	⋮
<input type="checkbox"/>	<input type="checkbox"/> cuberduck-readme.txt	Mon, Mar 7, 2022 at 08:20:00 UTC	1.4 KiB	Standard	⋮
<input type="checkbox"/>	<input type="checkbox"/> rhel8-kvm-qcow2rhel-8.8-x86_64-kvm.qcow2	Sat, Nov 11, 2023 at 13:25:12 UTC	883.88 MiB	Standard	⋮
<input type="checkbox"/>	<input type="checkbox"/> test23.txt	Mon, Apr 22, 2024 at 14:33:22 UTC	47 bytes	Standard	⋮
<input type="checkbox"/>		Tue, Apr 23, 2024 at 12:56:10 UTC	145 bytes	Standard	⋮

Metrics

Pre-Authenticated Requests

Work Requests

Lifecycle Policy Rules

Replication Policy

Retention Rules

Uncommitted Multipart Uploads

Logs

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oci cli example to access Object Storage on Oracle Cloud Infrastructure

oci cli: command line utility to query and manage OCI resources.
Enable oci cli from your workstation/laptop: 'oci cli' runs on Windows, Linux, Mac, Solaris: see <https://docs.oracle.com/en-us/iaas/Content/API/SDKDocs/cliinstall.htm>

USAGE:

- Get the storage namespace: `oci os ns get`
- Upload an object: `oci os object put -ns <objectstorage-namespace> -bn <bucket-name> --file <file location>`
- Download an object from the bucket: `oci os object get -bn bucket-client --file - --name test.txt`
- Example: `oci os object put -ns fr9**** -bn my-bucket1 --file test24-oci`

[Ref: oci cli getting started and installation](#)

[Ref: oci os object ref](#)

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Metrics

Pre-Authenticated Requests

Work Requests

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Search by prefix

<input type="checkbox"/>	Name	Last Modified	Size	Storage Tier	
<input type="checkbox"/>	<input type="checkbox"/> CentOS79-64bit.vmdk	Mon, Aug 8, 2022 at 18:54:47 UTC	6.07 GiB	Standard	:
<input type="checkbox"/>	<input type="checkbox"/> cuberduck-readme.txt	Mon, Mar 7, 2022 at 08:20:00 UTC	1.4 KiB	Standard	:
<input type="checkbox"/>	<input type="checkbox"/> rhel8-kvm-qcow2rhel-8.8-x86_64-kvm.qcow2	Sat, Nov 11, 2023 at 13:25:12 UTC	883.88 MiB	Standard	:
<input type="checkbox"/>	<input type="checkbox"/> test22.txt	Mon, Apr 22, 2024 at 14:33:22 UTC	47 bytes	Standard	:
<input type="checkbox"/>	<input type="checkbox"/> test23.txt	Tue, Apr 23, 2024 at 12:56:10 UTC	145 bytes	Standard	:
<input type="checkbox"/>	<input type="checkbox"/> test24-oci	Tue, Apr 23, 2024 at 13:09:00 UTC	195 bytes	Standard	:

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Mounting Object storage on Linux host as a filesystem

Install and configure s3fs-fuse on your workstation/laptop:

Detail <https://github.com/s3fs-fuse/s3fs-fuse>

USAGE:

- Enable EPEL repo: <https://docs.oracle.com/en/industries/communications/session-monitor/5.1/upgrade/install-oracle-epel-repository.html>
- sudo dnf install s3fs-fuse
- Create credential file: \$HOME/.passwd-s3fs containing access key:secret key
- Mount the Object storage bucket as Object Storage: s3fs mybucket https://<bucket-namespace>.compat.objectstorage.<oci-region>.oraclecloud.com/ -o passwd_file=\${HOME}/.passwd-s3fs -o use_path_request_style
- Copy files to and from Object storage
- Need root user (or sudo permission) to mount the filesystem

```
[root@mysql5 ~]# df -h
Filesystem      Size  Used Avail Use% Mounted on
devtmpfs        7.7G   0  7.7G   0% /dev
tmpfs           7.7G   0  7.7G   0% /dev/shm
tmpfs           7.7G  97M  7.6G   2% /run
tmpfs           7.7G   0  7.7G   0% /sys/fs/cgroup
/dev/sda3       39G   10G   29G  26% /
/dev/sda1      200M   7.4M  193M   4% /boot/efi
tmpfs           1.6G   0   1.6G   0% /run/user/0
tmpfs           1.6G   0   1.6G   0% /run/user/993
tmpfs           1.6G   0   1.6G   0% /run/user/1000
s3fs            64P    0   64P   0% /marius-bucket1
[root@mysql5 ~]#
```

```
[root@mysql5 ~]#
[root@mysql5 ~]# cd /marius-bucket1
[root@mysql5 marius-bucket1]# ls
CentOS79-64bit.vmdk  cuberduck-readme.txt  rhel8-kvm-qcow2rhel-8.8-x86_64-kvm.qcow2  test22.txt  test23.txt  test24-oci
[root@mysql5 marius-bucket1]# cp /etc/motd .
[root@mysql5 marius-bucket1]# ls -l
total 7265603
-rw-r-----. 1 root root 6513164288 Aug  8  2022 CentOS79-64bit.vmdk
-rw-r-----. 1 root root      1429 Mar  7  2022 cuberduck-readme.txt
-rw-r--r--. 1 root root           0 May  3  09:15 motd
-rw-r-----. 1 root root 926810112 Nov 11 13:25 rhel8-kvm-qcow2rhel-8.8-x86_64-kvm.qcow2
-rw-r-----. 1 root root       47 Apr 22 14:33 test22.txt
-rw-r-----. 1 root root      145 Apr 23 12:56 test23.txt
-rw-r-----. 1 root root      195 Apr 23 13:09 test24-oci
[root@mysql5 marius-bucket1]#
```

Object Storage Pre-Authenticated Request (PAR)

Use pre-authenticated request feature to give users access to an Object Storage bucket or an object without having to provide their sign-on credentials.

Access to objects or buckets can be read only, write only, or read/write.

Create Pre-Authenticated Request

[Help](#)

Name

par-bucket-20240516-1645

Pre-Authenticated Request Target

Bucket

Create a pre-authenticated request that applies to all objects in the bucket. ✓

Object

Create a pre-authenticated request that applies to a specific object.

Objects with prefix

Create a pre-authenticated request that applies to all objects with a specific prefix.

Access Type

☒ Permit object reads

☐ Permit object writes

☐ Permit object reads and writes

☐ Enable Object Listing
Let users list the objects in the bucket.

Expiration

Dec 31, 2024 14:45 UTC

Create Pre-Authenticated Request

[Cancel](#)

PAR Detail: <https://docs.oracle.com/en-us/iaas/Content/Object/Tasks/usingpreauthenticatedrequests.htm>





More resources

Oracle Cloud Infrastructure Getting Started:

<https://docs.oracle.com/en-us/iaas/Content/GSG/Concepts/baremetalintro.htm>

Enable OpenSSH on Windows Server:

https://learn.microsoft.com/en-us/windows-server/administration/openssh/openssh_install_firstuse?tabs=gui

[FileZilla](#) client using private ssh key: <https://filezilla-project.org>

[Rsync](#) <https://rsync.samba.org/documentation.html>

– Linux to Linux used to keep folders synchronized

[Robocopy](#): <https://learn.microsoft.com/en-us/windows-server/administration/windows-commands/robocopy>

~Rsync for Windows: keep files and folders in sync

[SFTPGO](#): <https://docs.oracle.com/en/learn/oci-object-storage-sftpgo/index.html#task-5-add-users-in-sftpgo>

Object storage file browsing using [Cyberduck](#)

[Curl using Oracle MOS Doc 2511612.1](#)

oci cli: oracle cloud command line tool: <https://docs.oracle.com/en-us/iaas/Content/API/SDKDocs/cliinstall.htm>

Mount OCI Object Storage on Linux filesystem: <https://github.com/s3fs-fuse/s3fs-fuse>