

User Guide

Dynamic Storage (ECS)

Swisscom (Schweiz) AG

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1 About Dynamic Storage

This Dynamic Storage user guide corresponds to the EMC-ECS (Elastic Cloud Storage) platform. For the legacy EMC-Atmos platform a separate Dynamic Storage user guide is available.

Dynamic Storage, the Cloud Storage of Swisscom, is a pay-per-use Object Storage optimized for storing data, e.g.: for backups, archives, storage extensions, big-data, etc.

Dynamic Storage can be accessed via the AWS S3 compatible API over HTTPS. There is no other direct access like CIFS, NFS or iSCSI. In order to access Dynamic Storage from within a system, the software needs to be coded against the S3 compatible API. Alternatively, a so called "Connector" or "access method" which translates the API towards the protocol needed, can be used.

Swisscom DCS (Dynamic Computing Services) users find more information about the usage and provisioning in the DCS user guide (e.g. direct internal connection not going through the internet).

This guide gives an overview about the connectors which are fully compatible with Dynamic Storage at Swisscom:

- EMC CIFS-ECS Tool
- Storage Gateway Appliance
- Amazon S3 Browser

The following picture gives an overview about these access methods:

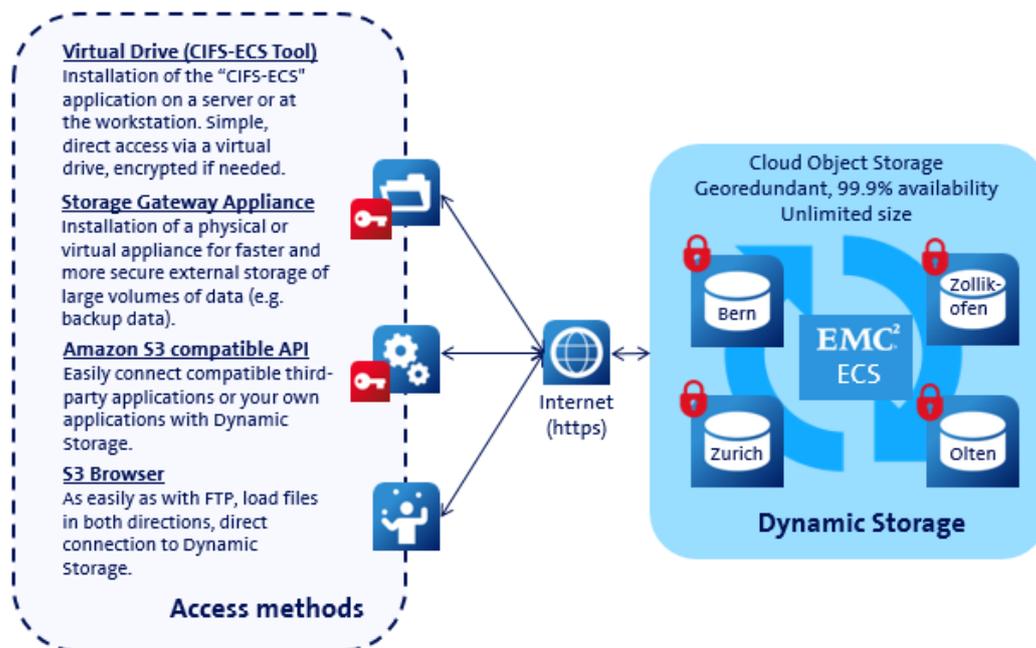


Figure 1: Dynamic Storage access methods

In order to access Dynamic Storage, the following Host URL are available:

1. Access to Dynamic Storage from outside Swisscom (over the Internet):
 - <https://ds11s3.swisscom.com>
2. Access to Dynamic Storage for static web pages and CORS (link):
 - <https://<Namespace>.ds11s3ns.swisscom.com>
3. Access to Dynamic Storage from within DCS:
 - DCS traffic may be routed separately from the internet traffic therefor does not affect Internet bandwidth.

Please note: Swisscom recommends to always encrypt the data before storing to Dynamic Storage. Swisscom provides a secure data transfer (https), but does not encrypt the data at rest.

For more information about Dynamic Storage, please see our factsheet on the web: www.swisscom.com/dynamicstorage or get in direct contact with your Swisscom representative.

2 Virtual drive, the EMC CIFS-ECS Tool

The EMC CIFS-ECS tool is the official connector of EMC for the Cloud Storage ECS platform (on which Dynamic Storage is based on). The CIFS-ECS tool is a Software currently available for Windows Operating Systems. After installation, CIFS-ECS provides a virtual drive (similar to a network share) to the operating system where it is installed on, which points directly to Dynamic Storage. CIFS-ECS provides a variety of functionality but no de-duplication.

Data may be encrypted before being stored in Dynamic Storage. Whatever is being stored on the virtual drive is automatically stored to Dynamic Storage. CIFS-ECS supports two different modes:

- **Mirror Mode:** All data is stored locally and in the cloud.
- **Stub Mode:** After a configurable time without access, the data remains stored in Dynamic Storage and is locally represented by a pointer to this data (the “stub”). This mode minimizes the storage requirements on the local system.

The following pictures illustrates the CIFS-ECS user interface:

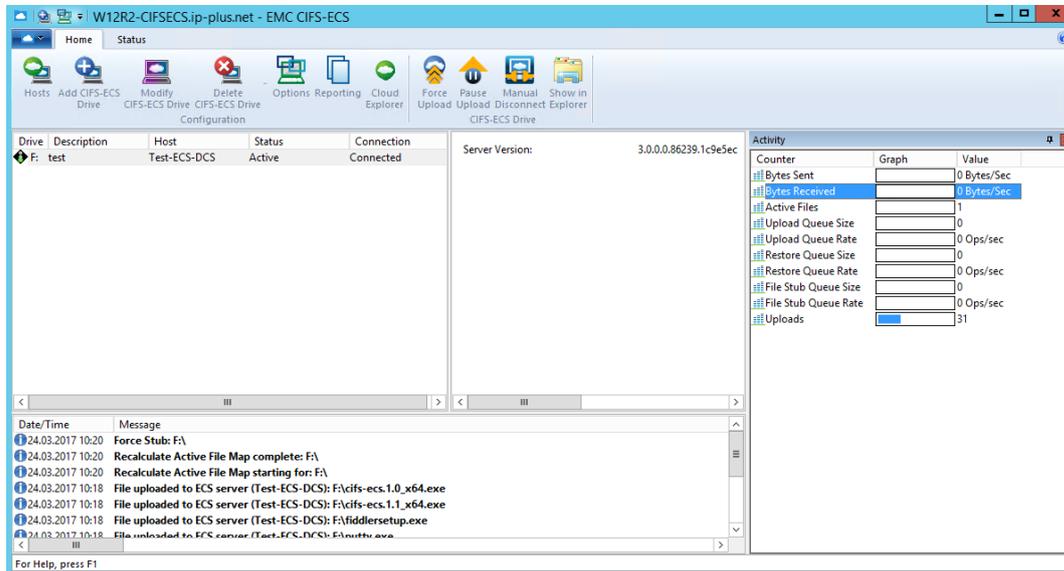


Figure 2: CIFS-ECS user interface

In order to connect the CIFS-ECS to Dynamic Storage it needs to be configured. The following details are necessary:

CIFS-ECS	Description
Server Type	ECS (note: CIFS ECS may not be used for the Atmos platform)
Server Name	A free name can be chosen; it is independent from Dynamic Storage.
Description	This field can be used for entering additional information.
User ID	The namespace-account ID.
Secret Access Key	The Secret Access Key
Host name / IP	The Host URL (ds11s3.swisscom.com)

Table 1: Connection details CIFS-ECS

The following picture illustrates the CIFS-ECS connection tab:

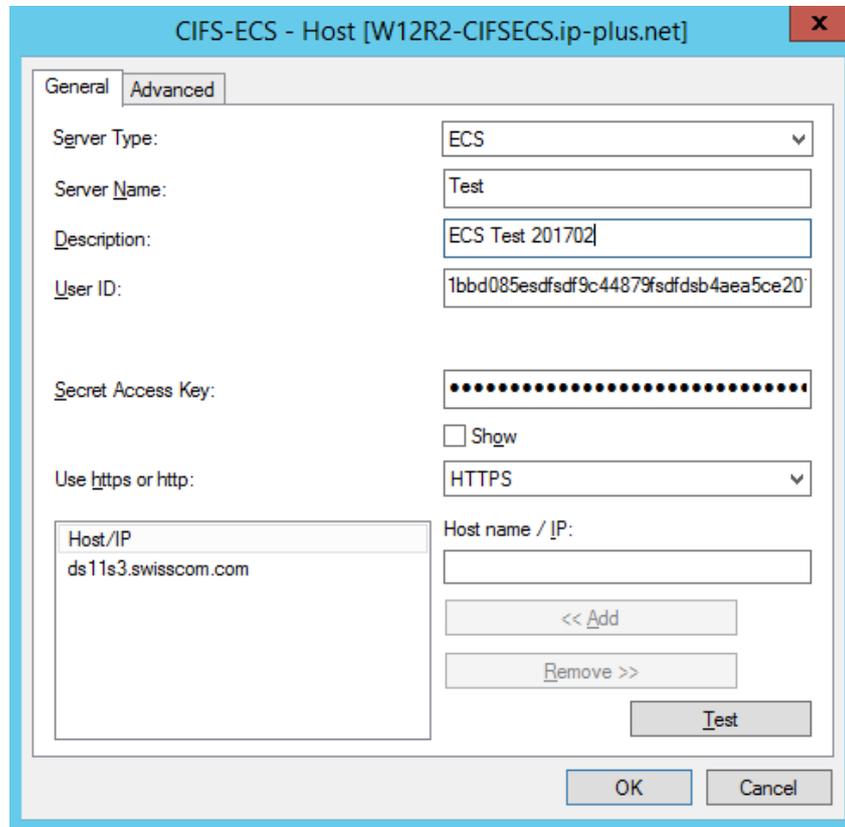


Figure 3: Connection details of the CIFS-ECS

The CIFS-ECS can be downloaded directly from the Swisscom customer portal of the Dynamic Computing Services (DCS) along with the necessary documentation. Its use is for free, there are no licensing cost associated with it and it can be installed on multiple (windows) systems. Further and more detailed information can also be found on the EMC support web.

Please note: Folder content shown in CIFS-ECS always show the default object: <_\$.folder\$>. This object contains the meta data of the respective folder and may not be changed or deleted.

3 Amazon S3 Brower

The Amazon S3 Brower allows direct access to Dynamic Storage. It can be downloaded from the Amazon Web pages where instructions are available as well. When using the S3 Brower to access Dynamic Storage users need to be aware that the functionality of the S3 Brower may be limited when being used for S3 compatible storage. However, Bucket and folder management, file up- and download etc. can easily be done.

The following picture illustrates the S3 Browser:

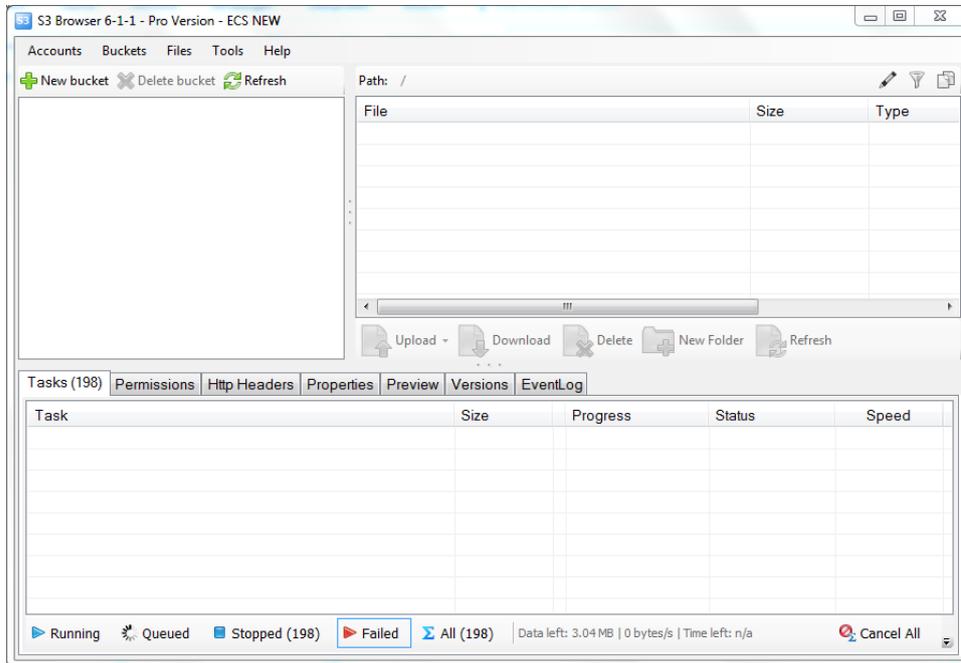
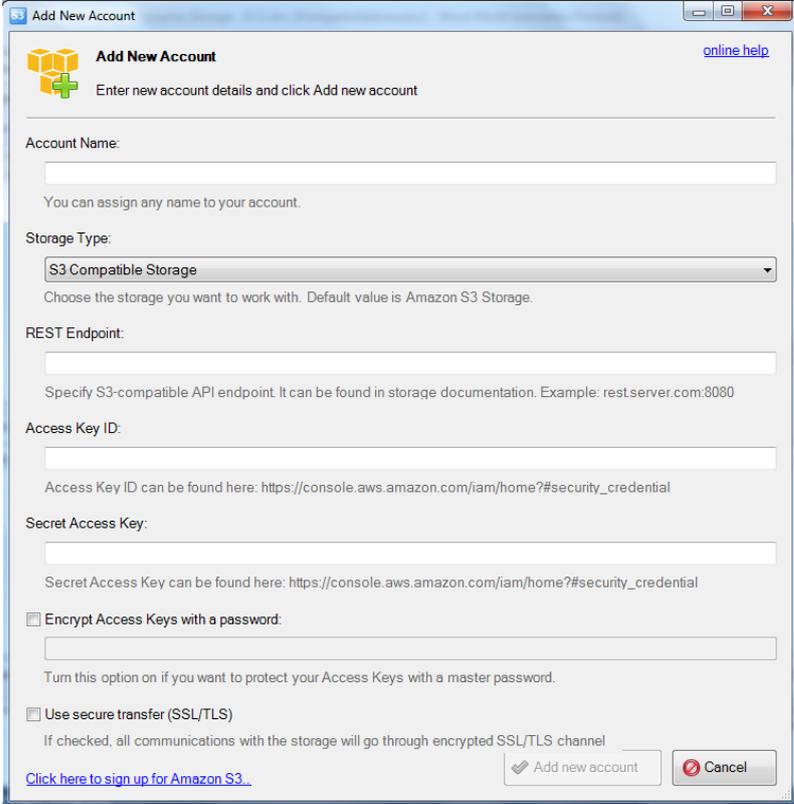


Figure 4: S3 Brower Interface

After installation, configuration of the Account is needed. Click on: Accounts, Add new account:



In order to use the S3 Browser the following details are necessary:

Field	Description
Account Name	A free name can be chosen; it is independent from Dynamic Storage.
S3 Compatible Storage	Necessary selection
REST Endpoint	ds11s3.swisscom.com
Access Key ID	Your <namespace-account>
Secret Access Key	Of your Dynamic Storage area
Encrypt Access Key with a password	For additional protection
Use secure transfer (SSL/TLS)	Must be selected, Swisscom accepts only encrypted transport

Table 2: Connection details S3 Browser

The S3 Browser is available as freeware, please visit the following website:

<http://s3browser.com/>

4 Storage Gateway Appliance

A variety of Storage Gateway Appliances are available from different suppliers. E.g. are the Cloud Array Appliance from Dell-EMC or the AltaVault Appliance from NetApp. Storage Gateway Appliances are optimized for large data sets. They offer functions like: local storage, caching, deduplication and encryption. For example: A Storage Gateway Appliance may for instance be considered as a replacement for a tape infrastructure (the backup media) replicating data to Dynamic Storage

Storage Gateway Appliances are available as a dedicated hardware appliance (for installation directly in the on premise data centre) or as a software image (VMware) with an out-of-the-box operating system (based on Linux/Unix) for virtual environments.

Swisscom provides consultancy and integration to its customers for Storage Gateway Appliances.

5 Amazon S3 compatible API

Applications may use the S3 compatible API directly.

Examples:

- A list for free libraries is provided under the following link by the Open Source community:
 - [Github EMC ECS](#)
 - [Github SDK dotNet](#)
 - [AWS Amazon Go](#)
 - [AWK Amazon Code](#)
- For further information, support and help, check out the EMC ECS Community under:
 - [ECS Data Access Guide](#)
 - [ECS 3.0 Product Documentation](#)
 - [CIFS-ECS-Architecture-Overview](#)
 - [ECS Amazon S3 Object Service API support](#)
 - [Management REST API](#)

Please note that Swisscom does not grant support on self-developed applications.

6 Dynamic Storage Access Credentials:

The following table shows the naming and the content of the access credentials for Dynamic Storage:

Field	Content	Example
Host URL	REST Endpoint	https://ds11s3.swisscom.com
Access Key ID	32 Characters-xxxxxx	1bbd085w69c4849e4dcv5ce2987edfr-test
Secret Access Key	28 Characters	5DjhVK3Mjwdc63JvQb1H146sdeM=

Table 3: Naming

7 Glossary

Object Storage

A storage architecture that manages data as objects, as opposed to other storage architectures like file systems which manages data as a file hierarchy and block storage which manages data as blocks within sectors and tracks.

CIFS

In computer networking, Server Message Block (SMB), the modern dialect of which is known as Common Internet File System. CIFS operates as an application-layer network protocol mainly used for providing shared access to files, printers, serial ports, and miscellaneous communications between nodes on a network.

iSCSI

In computing, iSCSI, is an acronym for Internet Small Computer System Interface, an Internet Protocol (IP)-based storage networking standard for linking data storage facilities.

NFS

Network File System (NFS) is a distributed file system protocol originally developed by Sun Microsystems in 1984, allowing a user on a client computer to access files over a network much like local storage is accessed.

REST

Representational state transfer (REST) is an architectural style consisting of a coordinated set of constraints applied to components, connectors, and data elements, within a distributed hypermedia system.