

Credibly secure cloud storage with elfCLOUD

**Privacy of private clouds
with the cost of the public cloud**

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elfcloud.fi

Abstract

elfCLOUD is a Finland based secure cloud platform. The platform combines the privacy of private clouds with cost-efficiency and ease of maintenance of the public clouds.

The entire architecture has been designed from the ground up with primary focus on information security and end-user privacy. Content is always encrypted locally on the users' device before transmitting to the cloud. The content keys are never sent to or stored on the elfCLOUD servers in usable format. Secure cloud assisted key sharing within and across organizations is supported and facilitated in a user-friendly manner.

The elfCLOUD platform provides open APIs and open-source client libraries as well as a set of readily available client applications for day-to-day file management, sharing, folder synchronization and backups.



elfCLOUD Mission and Motivation

- What we wanted to solve...
 - Content ownership, access authorization and control for the **content owners**
 - Usefulness of the cloud is obvious, but after decades of building firewalls why would one store important files outside?
 - Why would anyone really trust the provider?
 - Brand? Cost? Volume? Better store random byte streams!
 - The big provider, my password and HTTPS is there, but the servers can still be hacked or stolen, right?
 - How to securely store, use and share enterprise passwords?
 - Legislation and embargo related issues with foreign providers
 - Local operation with reachable people and support, readiness to make customer specific customizations and deployments
 - Very affordable solution also for small organizations and consumers

elfCLOUD History and Today

- Development started in 2010, growing from elfconsulting security evaluation and auditing business to answer secure cloud needs
- Closed pilot customers with a local brand in early 2012
- Public availability and re-branded as elfCLOUD H2/2012
- Three consumer and three corporate standard packages available with prices in the 10-120 euros monthly cost range
- Today thousands of users and hundreds of businesses signed up
- Desktop platforms and first mobile platforms are now supported.
- Active focus on building retailer and partnership network

So what's the difference?

Some Cloud Folder



BBC News Sport Weather Capital Future

NEWS TECHNOLOGY

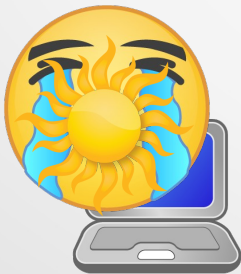
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2 September 2014 Last updated at 09:09 GMT [Share](#) [f](#) [t](#)

FBI investigates 'Cloud' celebrity picture leaks

COMMENTS (805)

Tim Allman reports on the hacking allegations surrounding private photos of several celebrities, including actress Jennifer Lawrence.



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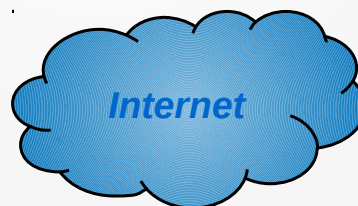
- Data is securely transmitted and then encrypted on the server.
- Key is stored with the data.
- Password reset and web access possible.

So what's the difference?

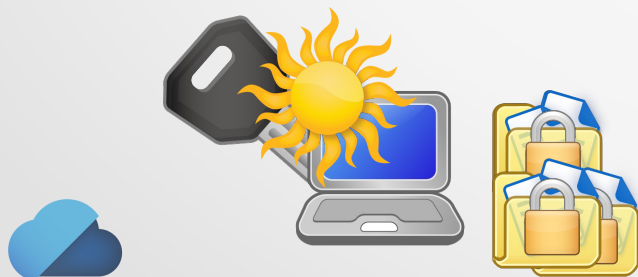
elfCLOUD Secure Storage



- Access your content securely from anywhere, with any device and at any time. Share as needed.



- Data is always locally encrypted before transit
- Key never goes to the server side in usable format
- Secured while in transit and in storage
- Data is kept within Finland, no export control or embargo issues with any type of data



elfcloud.fi

elfCLOUD Service Functionality

All applications share the principle of local encryption.

- File management (Beaver, Weasel, FUSE)
- Password management (Crow) with password folder sharing
- Folder synchronization (Mockingbird)
- Automated backups (Nightjar)
- Open back-end API and open source client libraries
 - API: HTTP/JSON + raw HTTP (over TLS)
 - Libraries: C++, Java, Python, Objective-C

elfCLOUD Service Functionality

- User authentication and folder access distinct from crypto keys and possibility to decrypt and access file contents
 - For example, IT admins can still take offline backups or manage the folder hierarchy without being able to read the documents.
 - Content owners can truly manage distribution without technical skills.
- No practical limit on the stored file size
- Possible to use web link for sharing files through browser download
- Account and contact level trust relationships for inter-account crypto key sharing and convenient address book based privileges management for users, groups, organization units

elfcloud.fi™ Beaver - File management - Top level folders

File Tools View Help

Home Back Refresh New Upload Download Details Move Delete Preferences Keys Search Address book Inbox My elfcloud.fi Help

Vaults: 5 (total size: 9.6 GiB) External vaults: 0 (total size: 0 B)

	Name	Last modi...	Size	Last acce...	Owner	Type
	Messut	2014-0...	36.4 MiB	2014-0...	admin	fi.elfcloud.backup
	Dokumentit	2014-0...	4.3 MiB	2014-0...	Tuoma...	fi.elfcloud.datastore
	Management team	2014-0...	9.5 MiB	2014-0...	Tuoma...	fi.elfcloud.backup
	Musiikki	2014-0...	192.5 ...		Tuoma...	fi.elfcloud.backup
	USB Test Data Sync	2014-0...	9.3 GiB	2014-0...	Tuoma...	fi.elfcloud.backup

Messut
Luonnokset
Dokumentit
Management team

Synchronization settings

Synchronization settings

Add synchronization settings

Cloud folder: Management team

Folder: /home/tonttu/ec Select

Direction: Two-way synchronization

Demo Key

Encryption key: Crypto key for demo account purpose
799dca72db5bf694a81739448aaba8 Select
AES256

Synchronization: Enabled Disabled

elfcloud.fi Mockingbird installation is required for file synchronization.
Please note that your login information is stored in local configuration files when synchronization is enabled.

Create Close

Permission editor

Permission editor

Permissions for folder Management team

Administration

Allow	Tuomas Tonteri (Tuomas) tuomas.tonteri@elfcon.net demo.fi (demo.fi)	Folder read access Access rights editing Folder write access Access rights viewing
Allow	admin sanna.kokkonieni@elfcon.net demo.fi (demo.fi)	Folder read access Access rights editing Folder write access Access rights viewing

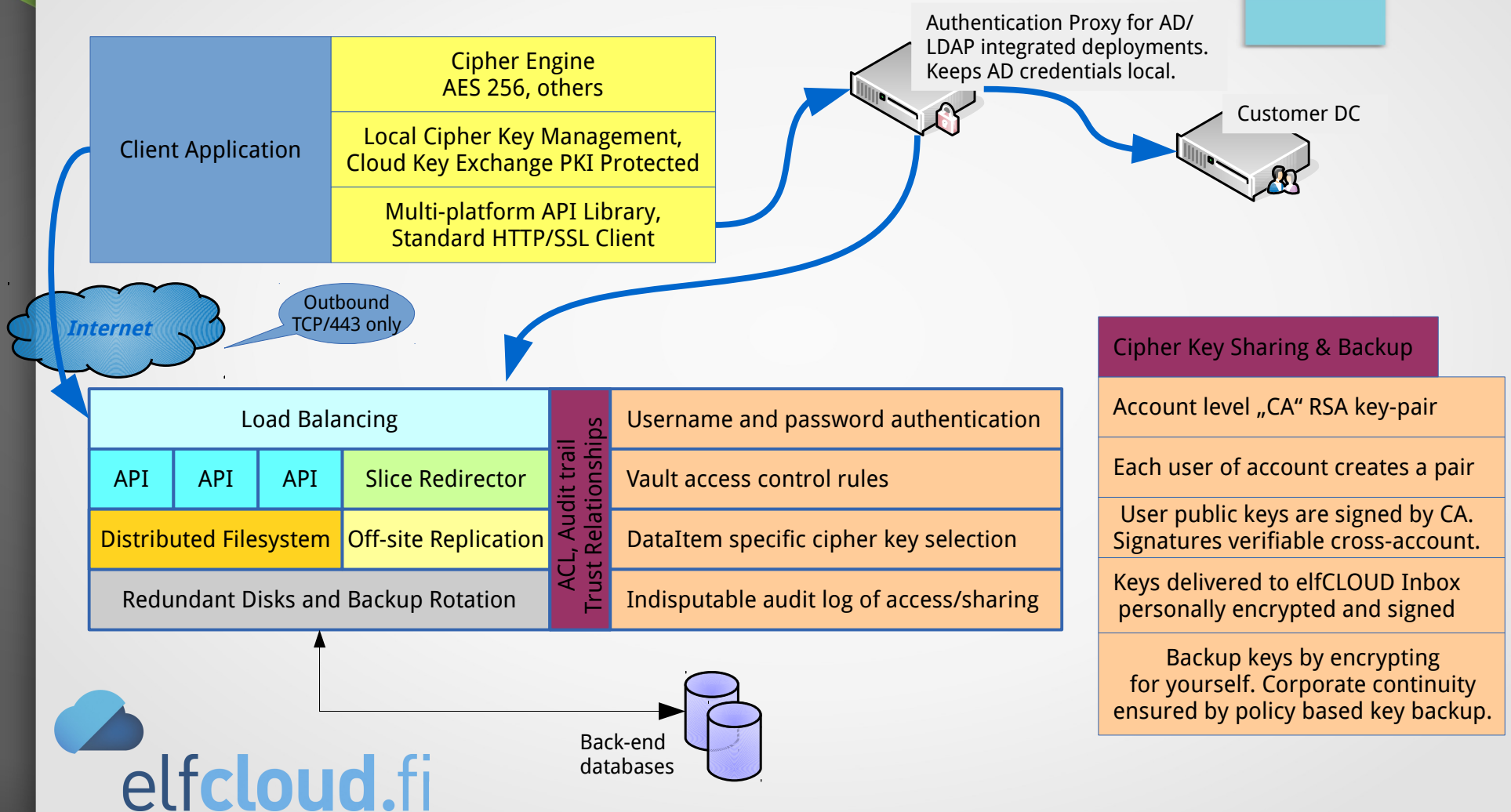
Explicit rules

Allow	Avaimeton Käyttäjä (avaimeton) matti.siipola@elfcon.net demo.fi (demo.fi)	Folder read access Access rights viewing
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New rule Edit rule Remove rule

Save Close

elfCLOUD Architecture and Security Model



Contact

Further information, customization and partnership enquiries

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