



Sizing up some typical cloud storage providers

Safe Haven?

Many companies now offer data storage in the cloud. We tested seven alternatives with a

close look at security features. *By Erik Bärwaldt*



Cloud services continue to enjoy great popularity. Most vendors compete to see who can provide more capacity for a lower price, but other considerations are also important. For instance, many users wonder which service will be better at protecting privacy.

Cloud services are often used for collaborative work when it is essential to keep the data of all participants in sync. Many services also offer a version history that can be used to understand changes to files. However, because of the growing storage quotas, many users also use the services for file sharing – not least because many email providers continue to limit the maximum size of file attachments to a few megabytes. In such cases, cloud storage provides a convenient option for distributing data by setting up appropriate shares.

In this article, I consider security and privacy, as well as the free storage quota and ergonomics for manually uploading and downloading files.

Copy

The provider Copy [1] belongs to the California company Barracuda Networks Inc., which enjoys a good reputation internationally as a developer of security solutions in the IT sector. However, the servers are located in the United States, making them less suitable for storing sensitive data. A look at the privacy policy [2] will confirm this: Copy reserves several options for the use of its customers' private data.

The company offers 15GB of free storage space for each user that registers on the website. This can be increased to 20GB through loyalty programs, such as inviting new users. If you need more space, you can receive 250GB of storage space as a private client with the "Pro" version at a price of \$4.99 per month. Copy offers special "Company" tariffs for one or more terabytes of storage capacity. The pricing here is also determined by the number of users.

Copy provides both the mandatory web interface and special client software for multiple platforms for managing and using the service. Linux users download a TGZ archive of almost 50MB from the website via the *Install desktop app* link and install the program. The graphic client, called up in the terminal with the `./CopyAgent` command, initially either allows you to log

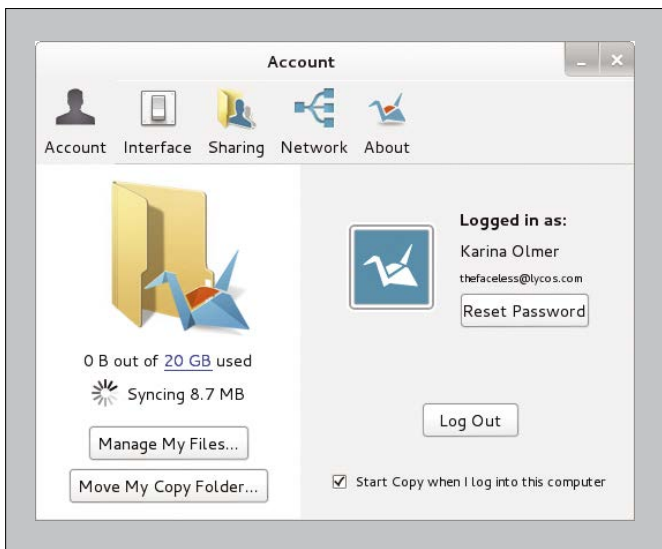


Figure 1: The Copy file host offers very intuitive client software.



on to an existing account or create a new one. The program creates a folder called Copy, whose contents it subsequently aligns with cloud storage on the local hard disk.

An active Copy agent places an icon in the system tray of the desktop. Right-clicking it opens a context menu. Here you can access the cloud service's most important basic functions. You can configure settings in the Preferences window, which you can access via the main menu (Figure 1).

To make files accessible to other users, click on the *Visit Copy website* entry in the system tray in the applet menu. Your personal page for the service will then appear in the browser; it lists the files contained in the cloud on the right-hand side. Select the files to be shared here by right-clicking and selecting the *Share* menu item from the context menu. Then, specify the recipient by entering an email address (Figure 2). The service allows you to share the object with multiple users or groups and to establish special rights regarding the share.

The recipient can view the received file, including the given rights in the *Received* tab, via *Preferences | Sharing* (Figure 3). Double-clicking the file name will open the Copy website and allow access. Subject to the rights assigned, other file operations may also be possible.

Dropbox

Dropbox is one of the world's largest cloud providers and is considered a pioneer in this area. The service is also suitable for use in heterogeneous IT environments thanks to the client applications for multiple platforms. Dropbox uses Amazon's S3 web service for storage. The service transmits the packets in encrypted form and also stores them AES-encrypted in the cloud. However, as Dropbox itself stores the private key, there is no secure end-to-end encryption. The provider also reserves full access rights to your stored data for the cases in which it is obliged to do so [3].

The company offers the setup for Linux in DEB and RPM format and as a source for download [4]. This is an initialization program, which only downloads and installs the actual Dropbox client after starting; it then opens and retrieves the access data. If you have not registered yet, you can do so by clicking on *Register* in the login window. Dropbox also creates a folder of the same name on the local hard disk when you log in for the first time; the software saves the data to be synchronized in this folder.

The free storage quota (only 2GB) is significantly lower than that of Copy. However, Dropbox also offers options for increasing the available storage space by recruiting new members, for

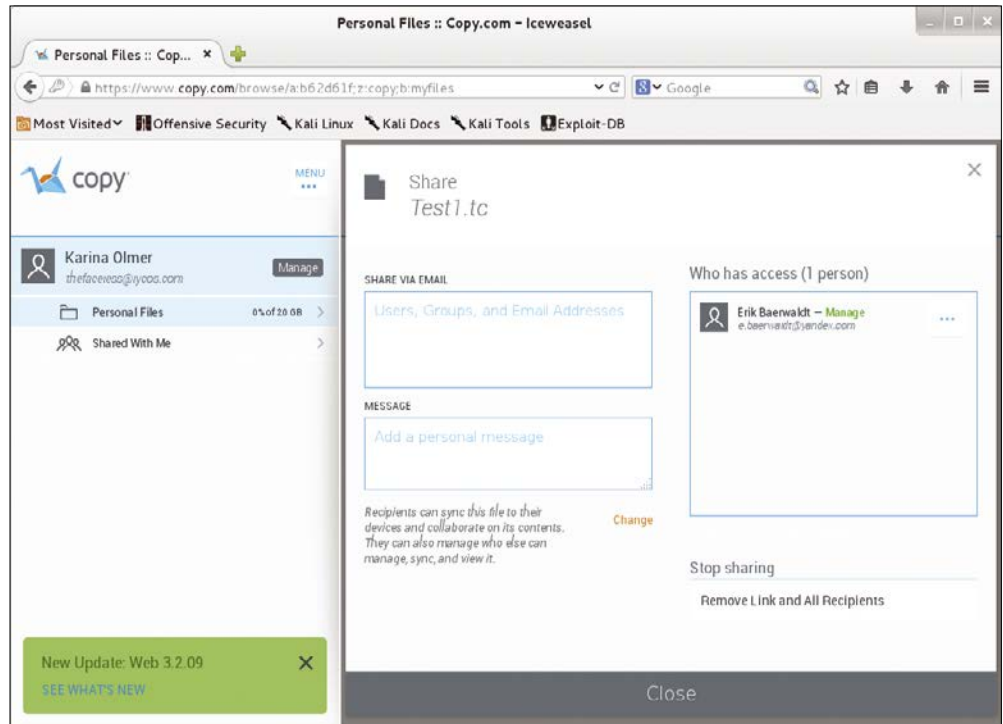


Figure 2: The Copy service offers several options for sharing your files with others.

example. The company merely provides one option for private users in the form of a 1TB upgrade, which costs \$9.99 per month or \$99 per year. The price for use in companies depends on storage size and number of users.

Sharing files in Dropbox is similar to Copy and occurs via the website by first creating a folder in which you save the contents to be shared. You can do this either in the local Dropbox folder using the file manager or by dragging and dropping in the web browser. After successfully uploading files to the cloud, click on the folders to be shared in the web GUI; the *Share* button will then appear to the right on the line. Clicking on it opens an options window where you choose whether you just want to send a download link or whether the recipient should be allowed to edit the shared data directly (Figure 4).

After selecting a sharing option, the next window prompts you to invite users. As with Copy, you enter the email address of recipients who should receive access to the shares here. After receiving the message, the recipients then decide whether to accept or decline the invitation. If the recipients already have a Dropbox account, the service integrates the shared data into their storage after acceptance. They can also see in the

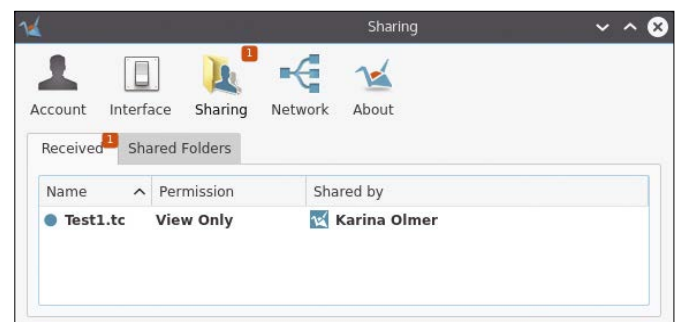


Figure 3: Copy displays this screen to the recipient of a shared file.



COVER STORIES

Comparing Cloud Providers

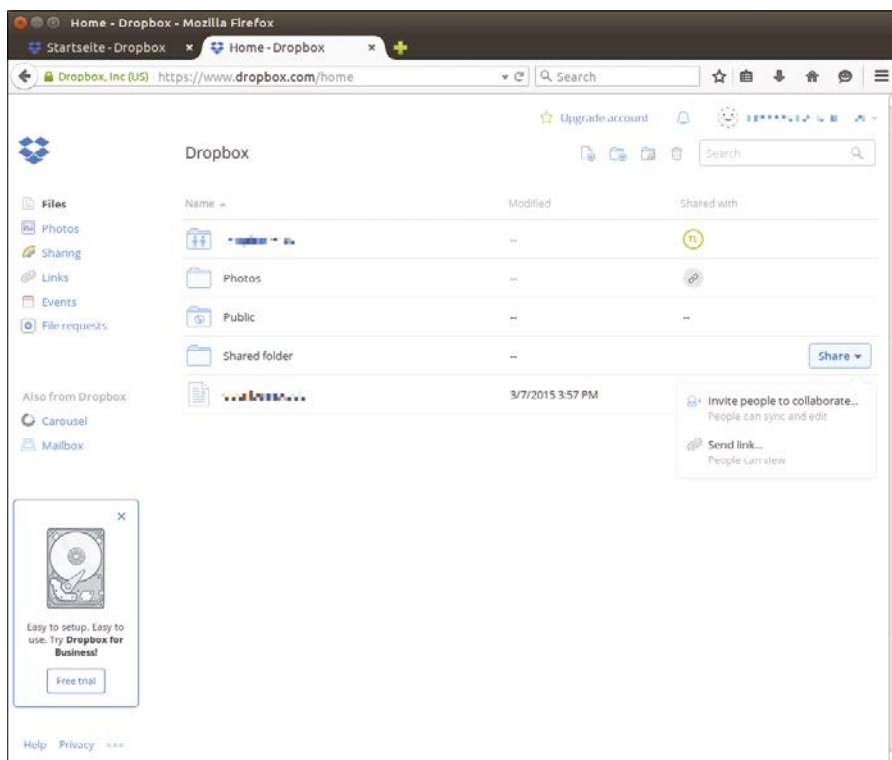


Figure 4: In Dropbox, you can easily share your data with other users via the web GUI or send them share links via email.

web browser which users are allowed to access the shared data (Figure 5).

Google Drive

The search engine giant Google, like Copy and Dropbox, comes from the United States and is therefore also subject to the US

comes you with a tidy web interface.

To begin, you create and name a new folder in the Google Drive web interface by clicking on the red *New* button on the left side of the window. To copy files into it, select *New*. If you want to share content with other users, you need to send a share link for the object. You can get this by clicking the object in question

Patriot Act. The Google Drive cloud service provides you with 15GB of free storage, which you can expand as required through various subscription models for a cost. The prerequisite for using Google Drive is a single sign-on, which is true for all other Google services. Note that Google still does not offer a Linux client. Resourceful developers utilize this deficit and offer a commercial Linux client called Insync [5].

Unlike most free cloud services, Google requires that you provide a multitude of personal information, such as date of birth, phone number, or email address when logging on. The service checks that the data is plausible as it is being entered.

Google sends you an opt-in email to the specified email address before activating your account; if you specify a phone number, you will also receive a text message. You verify the number as yours by entering the confirmation code on the registration page. After successfully registering, you will receive direct access to all services. Google Drive wel-

comes you with a tidy web interface. To begin, you create and name a new folder in the Google Drive web interface by clicking on the red *New* button on the left side of the window. To copy files into it, select *New*. If you want to share content with other users, you need to send a share link for the object. You can get this by clicking the object in question in the overview with the right mouse button and selecting *Share* from the context menu. In the subsequent dialog, you enter the recipients' email addresses and define their rights to the file (Figure 6).

Google also allows shares to recipients who do not have a Google account. The services makes this known after the file or folder has been released by sending an invitation email from which the linked content can be accessed. However, Google does not yet send back any revisions to the original sender.

Members of Google Drive receive an overview of the shared contents in the *Shared with me* pane in the web browser and can continue to edit shared files subject to the rights granted. The Office packet provided by Google online also lets you collaborate on documents without using a locally installed Office suite.

MyDrive

The cloud service MyDrive, which is based in Switzerland, is aimed less at

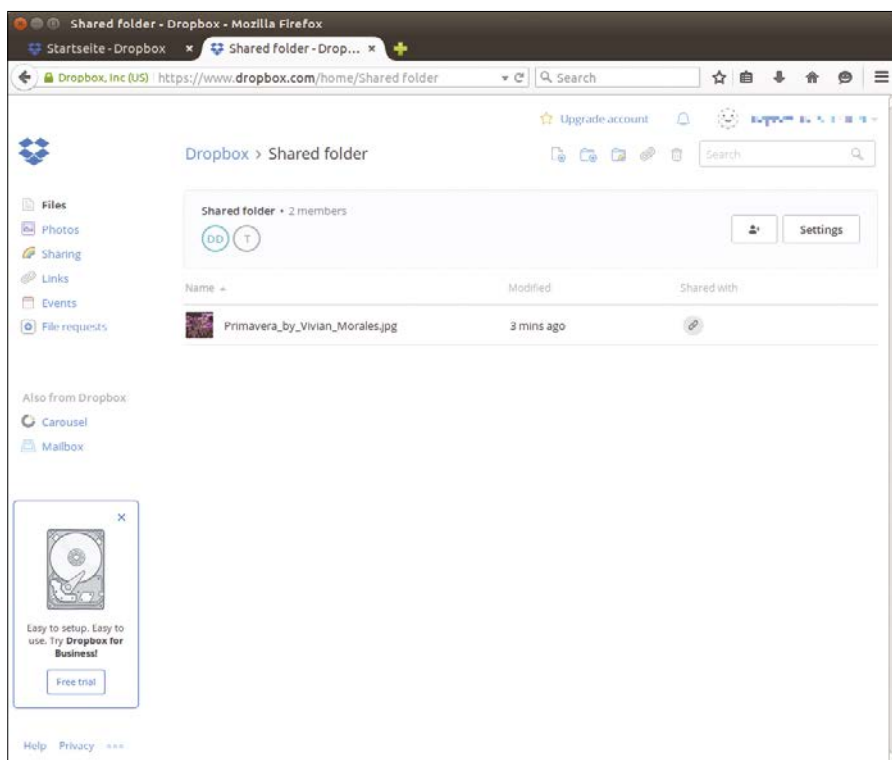


Figure 5: The recipient of shared Dropbox files receives detailed information about the share.

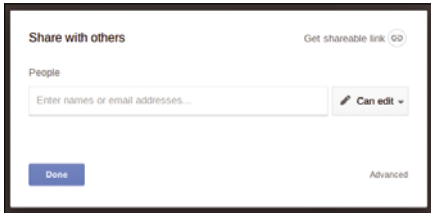


Figure 6: Google Drive reduces the sharing settings to the essentials.

collaboration and more at being an on-line backup medium. This service also allows guest users to access existing file holdings. Softronics Communication AG, the operator of MyDrive, provides 100MB of free storage volume, which can be expanded in increments up to 5GB for a fee.

You can access the cloud storage from Linux either via the web interface or by connecting the cloud directly to the file-system as a separate drive using the WebDAV protocol. Data transfers are SSL-encrypted. The service does not offer client software.

You can complete the MyDrive registration on the website [6], where you only need to specify a username and password. In typical fashion, the provider sends a confirmation link via email to activate the account. After clicking the link, MyDrive welcomes you with a simple dashboard (Figure 7).

To begin, you create a folder structure for storing data in the cloud by creating optional directories using the *Create folder* button. After switching to the desired folder and clicking on the *Upload* button on the left of the window, you select the files you want to upload in the file manager and complete the process by clicking *Upload*.

Guest users can grant different rights when sharing data. However, the free version of MyDrive only allows a single guest to be created. You can recreate this guest by clicking on the *Settings* entry on the left of the dashboard and then clicking *Guests* | *Create new guest user*. In the new dialog, you set up the guest account and specify appropriate rights (Figure 8).

The subsequent invitation allows the guest to log in with the access data in question and use the shared files. You can change the rights at any time by clicking on the person icon next to the folder you want to change and modifying the rights accordingly.

TeamDrive

The Germany-based cloud service TeamDrive is subject to the strict German Privacy Policy. The company provides 2GB of free space in the cloud for private customers – this can be expanded to a maximum of 10GB by referring friends. You

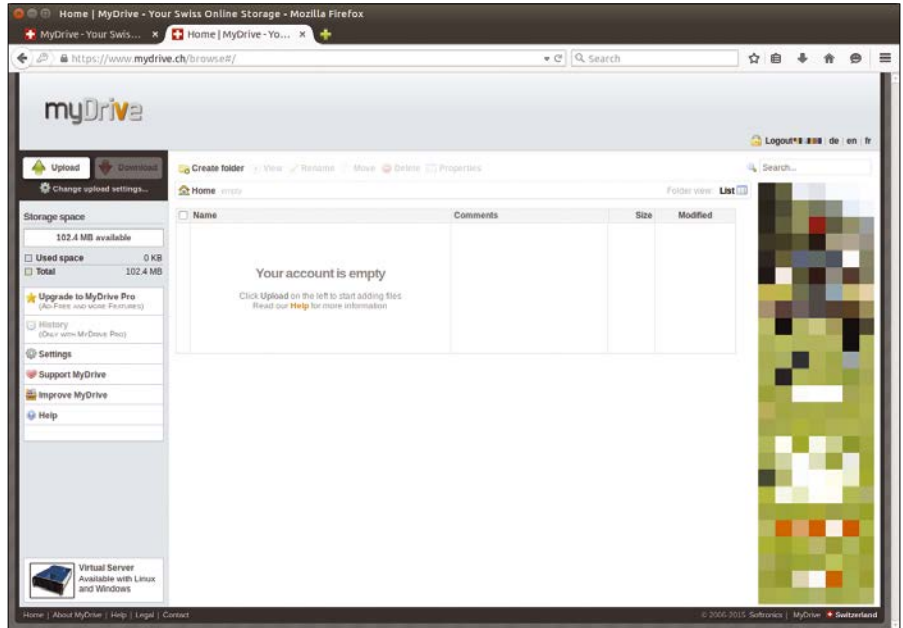


Figure 7: The MyDrive dashboard is clearly structured and tidily presented.

can choose between different fee-based options if you need more memory.

TeamDrive provides a Linux client for different packet management and hardware architectures that can be downloaded for free [7]. The software is mandatory for using the service. Additionally, the company also offers server solutions that sometimes (depending on amount of use) turn out to be free and store data locally and on the cloud. After downloading, you install the client from the terminal, and you can complete registration during the setup, as well; TeamDrive only asks for a username, password, and email address. The service is available for use after sending an email message to the specified address and subsequent confirmation (Figure 9).

TeamDrive manages data in the cloud in Spaces. Locally, these are nothing more than lists to be created. You can also

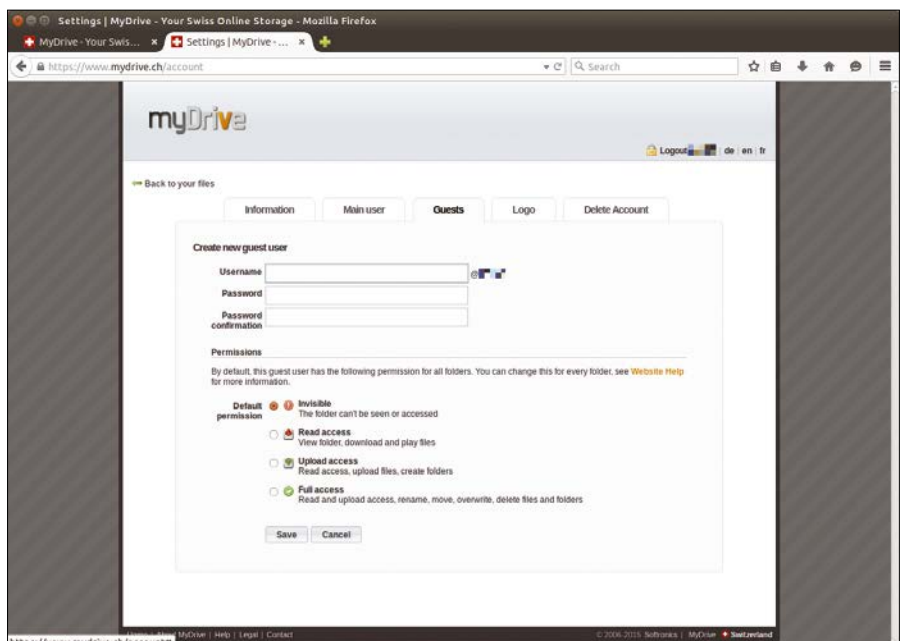


Figure 8: You can set up a guest user in MyDrive in just few clicks.



COVER STORIES

Comparing Cloud Providers



Figure 9: The TeamDrive client combines all the important information in one view.

completely manage the system via the client: this way you can share files with other members, define backup sessions, and configure synchronization. The process management integrated in the service makes it possible to reconstruct previous versions of a file during collaborative work. The provider from Hamburg accounts for security aspects in an exemplary fashion: It encrypts all data according to the AES-256 standard, for which the key remains on the client machine, and transmits all data with SSL encryption.

You can share your data with other users using the Invite Users dialog. Simply enter the appropriate email address and confirm it by clicking the *Invite Users* button. The recipient then receives the invitation email in his TeamDrive client with details of the rights granted. Clicking *Accept* accepts the share and displays it in the *Spaces* view (Figure 10).

Yandex.Disk

The Russian company Yandex – headquartered in Moscow – is expanding rapidly with different services, although its portfo-

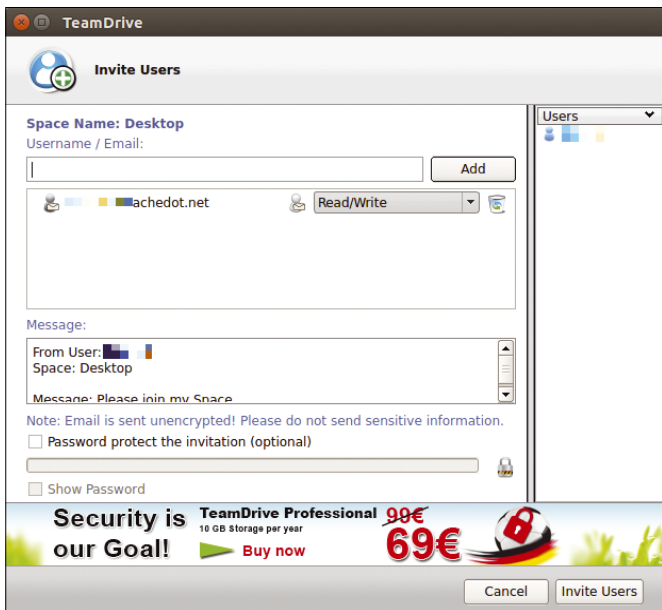


Figure 10: You can share data in TeamDrive via email.

lio, which is similarly to Google or Yahoo, already covers a wide spectrum.

The Yandex cloud service offers its customers 10GB of storage space for free; this can be expanded by a further 10GB by recruiting new members. There are three additional premium options for requirements beyond this amount. You will automatically receive the corresponding cloud storage if you register a free email address with Yandex. You can also register for the cloud service with Yandex without an email address [8]. Unlike the services presented previously, the service sends a text message after registering rather than a confirmation email. You must therefore specify a mobile phone number when registering for the cloud service rather than an email address. After successfully registering, you use Yandex.Disk through an intuitive web interface (Figure 11).

Just like MyDrive, Yandex transfers SSL-encrypted data, but it stores the data unencrypted on the cloud. Yandex.Disk also supports the WebDAV protocol, which allows you to mount the storage on the local filesystem at your own discretion. The company offers command-line clients for Linux systems that automatically perform data synchronization [9]. An additional graphics tool integrates with the file manager for KDE [10].

Click the *Shared folders* link at the top left in the main window of the Yandex.Disk web interface to share data with other users. In the dialog, you can select the folder you want to share after clicking the *Create shared folder* button. You can then specify who receives which rights to the folder by entering the recipient's email address and editing the share accordingly. Finally, click on the yellow *Invite* button to send the invitation to the recipient. The recipient then receives access to the shared folder by clicking on the corresponding link.

YourSecureCloud

The young, Germany-based, YourSecureCloud [11] primarily focuses its offerings on the business market and therefore only offers a free trial for private customers. Six tariff plans are available for paying private customers, whereas business customers can request a customized offer.

The name says it all with YourSecureCloud: The service attaches great importance to meeting the highest security standards. As well as encrypted data transfer, it also implements

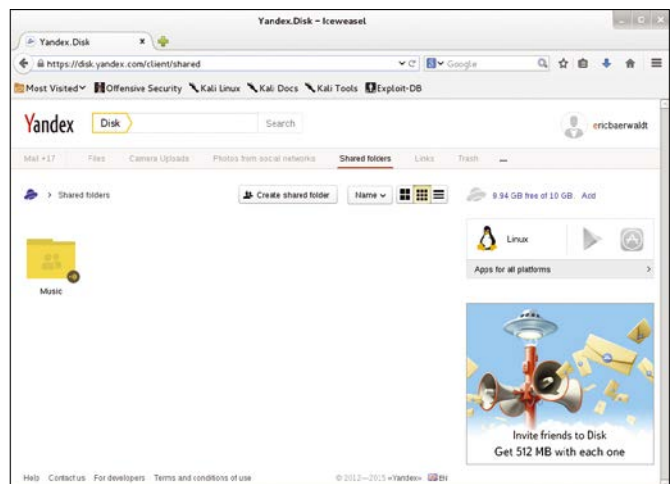


Figure 11: Yandex.Disk can also share data via the web interface.

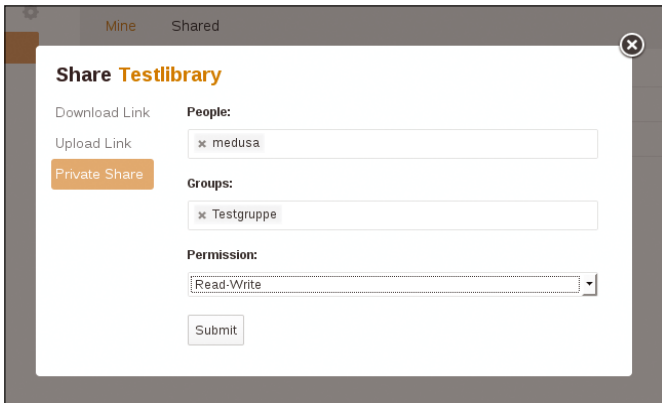


Figure 12: YourSecureCloud allows detailed rights to be assigned when sharing data.

a real end-to-end encryption of all data so that neither the provider nor unauthorized third parties can view the data. The server systems are also exclusively in German data centers. Unlike most cloud service providers, YourSecureCloud does not use conventional hard disk systems for mass storage; instead, it uses very powerful enterprise-class SSDs, which are used only occasionally elsewhere because of the very high costs.

YourSecureCloud provides its services via a web interface called Seahub and also via clients for all major platforms [12]. The free application Seafiler serves as basic software. For Linux, graphical clients are available for all derivatives of Debian, Ubuntu, and Linux Mint – and, in older versions, for ALT Linux. A command-line client offers rudimentary storage functions for all other distributions with RPM packet management and those using other packet management [13].

Marcus Müller, the company's technical administrator, confirmed on request that the software developed by the Chinese company Seafiler Ltd. will undergo extensive tests before the company makes a

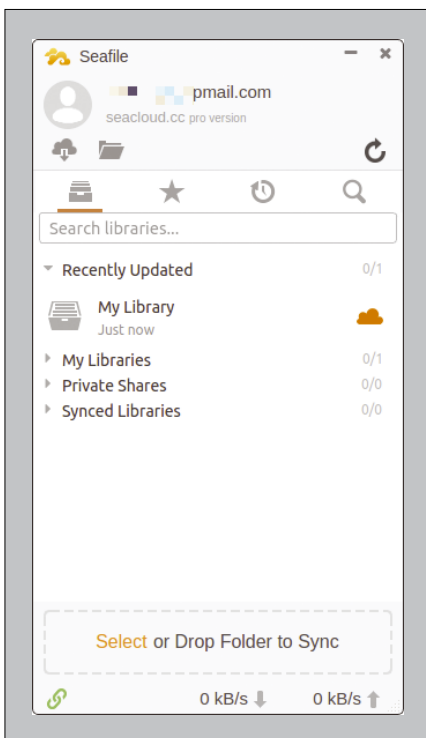


Figure 13: The YourSecureCloud client offers unrestricted access to shared files.

new version available for download on the YourSecureCloud website. This will help eliminate problems caused by the rapid development cycles.

To activate the test account with YourSecureCloud, you only need to enter an email address to which the service sends the access data. After registration, you first create a new library to which the shared data can be transferred in order to share data with other users. Then, click on the *Share* icon for the desired library menu in *My Home | Libraries* and specify in the resulting dialog whether you want to send the share link by email or want to share the data with another YourSecureCloud user. In this dialog, you can also specify whether the recipient can only read the shared data or also edit it (Figure 12).

Recipients invited by email can copy the files to their local system – they do not need a YourSecureCloud account to do so. If the recipient does have a YourSecureCloud account and also has the client installed on their system, the client window displays whether the data has been received and allows further processing subject to being granted the appropriate rights (Figure 13).

Conclusions

Trust is good; control is better. This saying could easily have been written about cloud data storage vendors. The security deficits we encountered when comparing cloud providers are alarming: All services may encrypt the data transmission between host and cloud, but only the two German companies (TeamDrive and YourSecureCloud) implement real end-to-end encryption. Thanks to its consistent use of free software for the cloud service, YourSecureCloud is also the only provider in this test largely to exclude hidden backdoors in its software.

However, if you attribute great importance to ease of use and ergonomics of the software when choosing a cloud service, you should take a look at Copy and TeamDrive: Both offer very easy-to-handle clients, although the TeamDrive experience is still rather unpleasant because of the pushy commercials in the program window. If you want to use as much free storage space as possible in the cloud and combine this with other services from the same manufacturer, Yandex.Disk and Google are suitable choices. ■■■

INFO

- [1] Copy: <https://www.copy.com>
- [2] Privacy policy at Copy: <https://www.copy.com/about/privacy/>
- [3] Dropbox privacy policy: <https://www.dropbox.com/privacy>
- [4] Dropbox client for Linux: <https://www.dropbox.com/install?os=lnx>
- [5] Google Drive client for Linux: <https://www.insynchq.com>
- [6] MyDrive: <https://www.mydrive.ch>
- [7] Download TeamDrive client: <https://www.teamdrive.com/en/downloads/>
- [8] Yandex.Disk registration: <https://disk.yandex.com>
- [9] Download Yandex.Disk client: <http://repo.yandex.ru/yandex-disk/>
- [10] Yandex project page: <http://help.yandex.com/disk/cli-clients.xml#cli-gui>
- [11] YourSecureCloud: <https://www.yoursecurecloud.de> (in German)
- [12] Download YourSecureCloud client: <https://www.yoursecurecloud.de/download.html>
- [13] Seafiler downloads: <http://www.seafiler.com/en/download/>