



# **ownCloud Client Manual**

***Release 2.1.1***

**The ownCloud developers**

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## INTRODUCTION

Available for Windows, Mac OS X, and various Linux distributions, the ownCloud Desktop Sync client enables you to:

- Specify one or more directories on your computer that you want to synchronize to the ownCloud server.
- Always have the latest files synchronized, wherever they are located.

Your files are always automatically synchronized between your ownCloud server and local PC.

---

**Note:** Because of various technical issues, desktop sync clients older than 1.7 will not be allowed to connect and sync with the ownCloud 8.1+ server. It is highly recommended to keep your client updated.

---

### 1.1 Improvements and New Features

The 2.1 release of the ownCloud desktop sync client has many new features and improvements. (See the [complete changelog](#).)

- Share with internal ownCloud users from your desktop
- Separate views for server activity, sync activity, and errors
- Don't re-upload \*.eml-files if size and checksum are unchanged
- Improved upload/download progress indicator



## INSTALLING THE DESKTOP SYNCHRONIZATION CLIENT

You can download the latest version of the ownCloud Desktop Synchronization Client from the [ownCloud download page](#). There are clients for Linux, Mac OS X, and Microsoft Windows.

Installation on Mac OS X and Windows is the same as for any software application: download the program and then double-click it to launch the installation, and then follow the installation wizard. After it is installed and configured the sync client will automatically keep itself updated; see [The Automatic Updater](#) for more information.

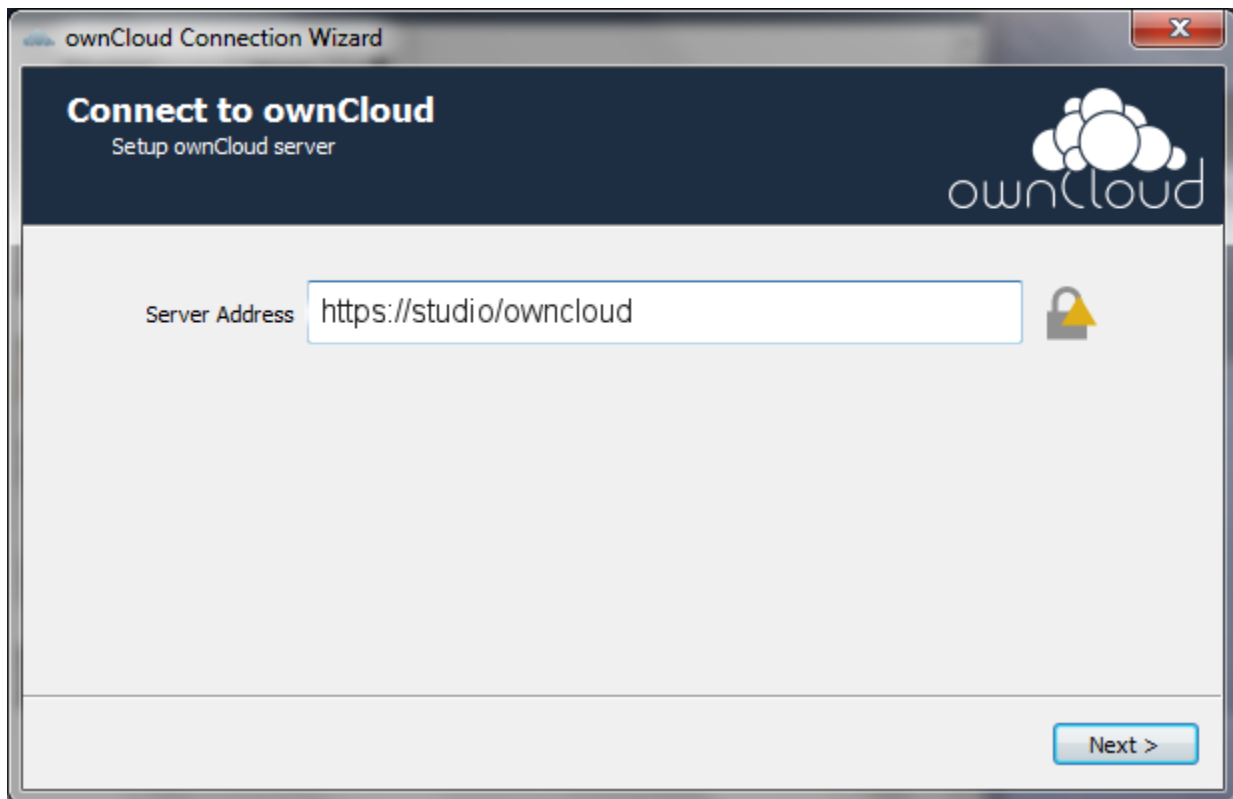
Linux users must follow the instructions on the download page to add the appropriate repository for their Linux distribution, install the signing key, and then use their package managers to install the desktop sync client. Linux users will also update their sync clients via package manager, and the client will display a notification when an update is available.

Linux users must also have a password manager enabled, such as GNOME Keyring or KWallet, so that the sync client can login automatically.

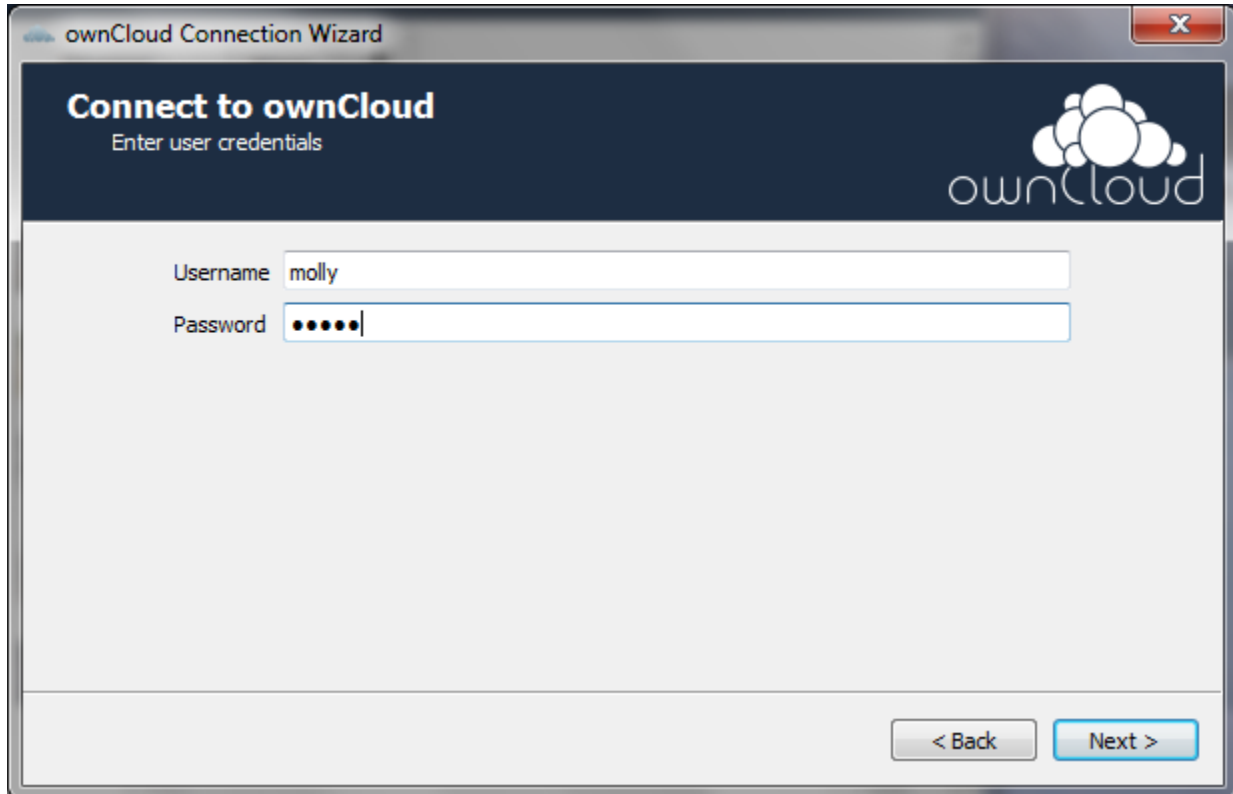
You will also find links to source code archives and older versions on the download page.

### 2.1 Installation Wizard

The installation wizard takes you step-by-step through configuration options and account setup. First you need to enter the URL of your ownCloud server.

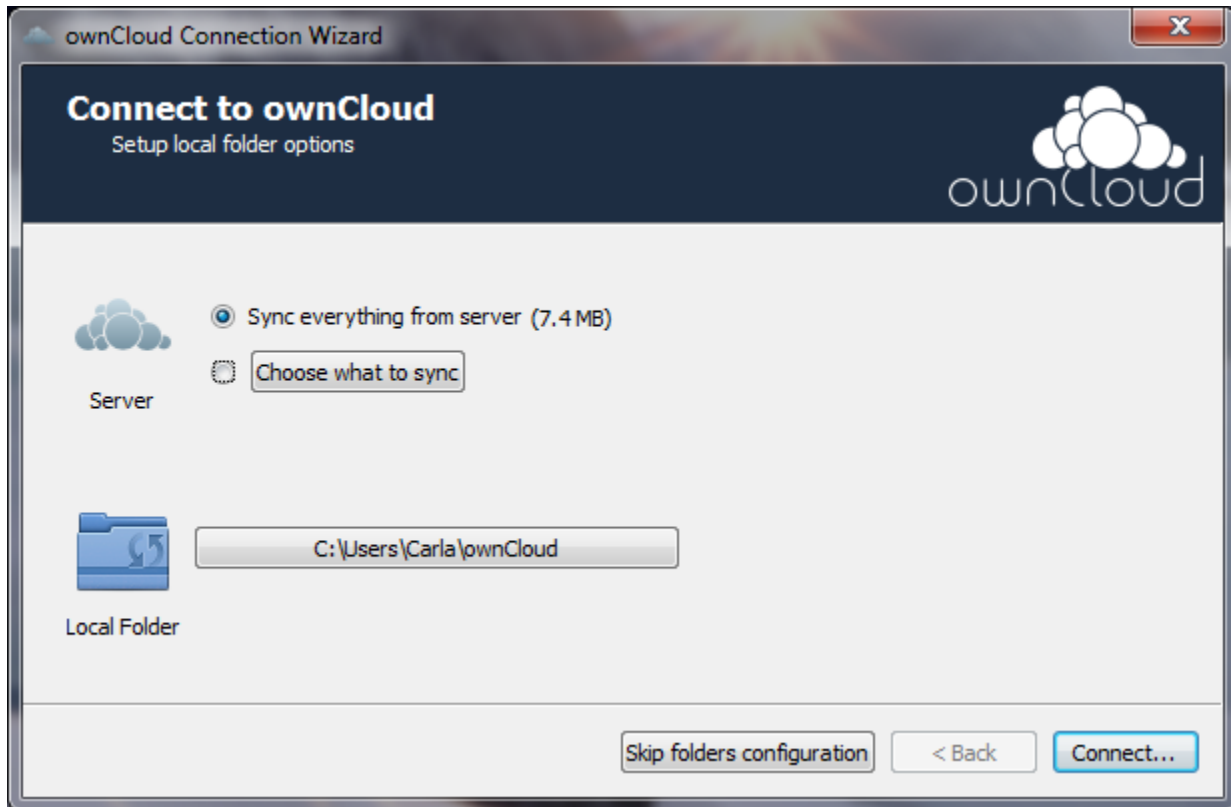


Enter your ownCloud login on the next screen.

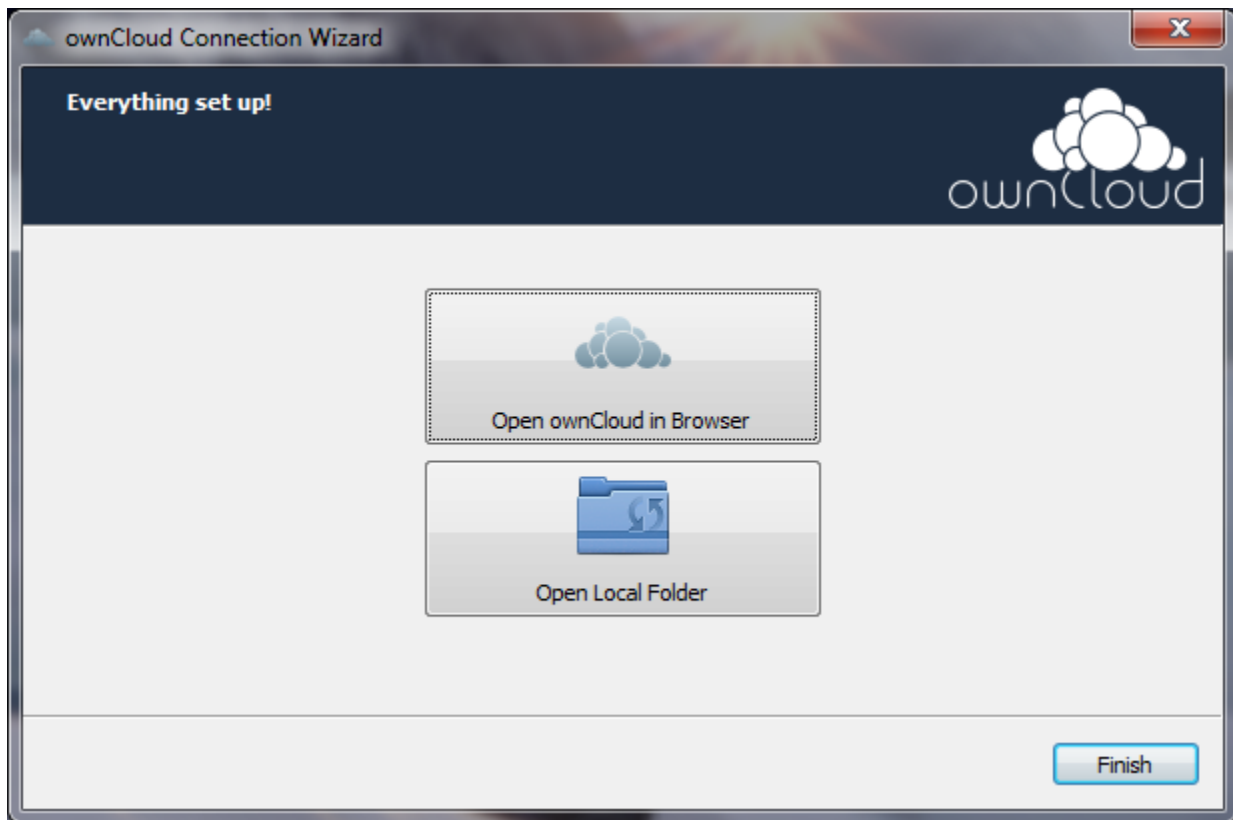


On the Local Folder Option screen you may sync all of your files on the ownCloud server, or select individual folders.

The default local sync folder is ownCloud, in your home directory. You may change this as well.



When you have completed selecting your sync folders, click the Connect button at the bottom right. The client will attempt to connect to your ownCloud server, and when it is successful you'll see two buttons: one to connect to your ownCloud Web GUI, and one to open your local folder. It will also start synchronizing your files.



Click the Finish button, and you're all done.

## USING THE SYNCHRONIZATION CLIENT

The ownCloud Desktop Client remains in the background and is visible as an icon in the system tray (Windows, KDE), status bar (Mac OS X), or notification area (Linux).



The status indicator uses overlay icons to indicate the current status of your synchronization. The green circle with the white checkmark tells you that your synchronization is current and you are connected to your ownCloud server.



The blue icon with the white semi-circles means synchronization is in progress.



The yellow overlay icon with the parallel lines tells you your synchronization has been paused. (Most likely by you.)

The gray icon with three white dots means your sync client has lost its connection with your ownCloud server.

When you see a white circle with the letter “i” that is the informational icon, so you should click it to see what it has to tell you.

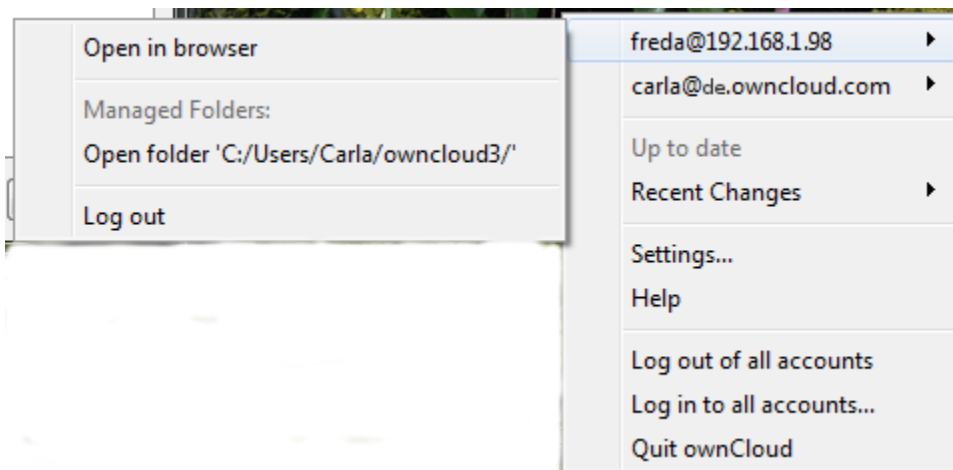
The red circle with the white “x” indicates a configuration error, such as an incorrect login or server URL.

### 3.1 Systray Icon

A right-click on the systray icon opens a menu for quick access to multiple operations.

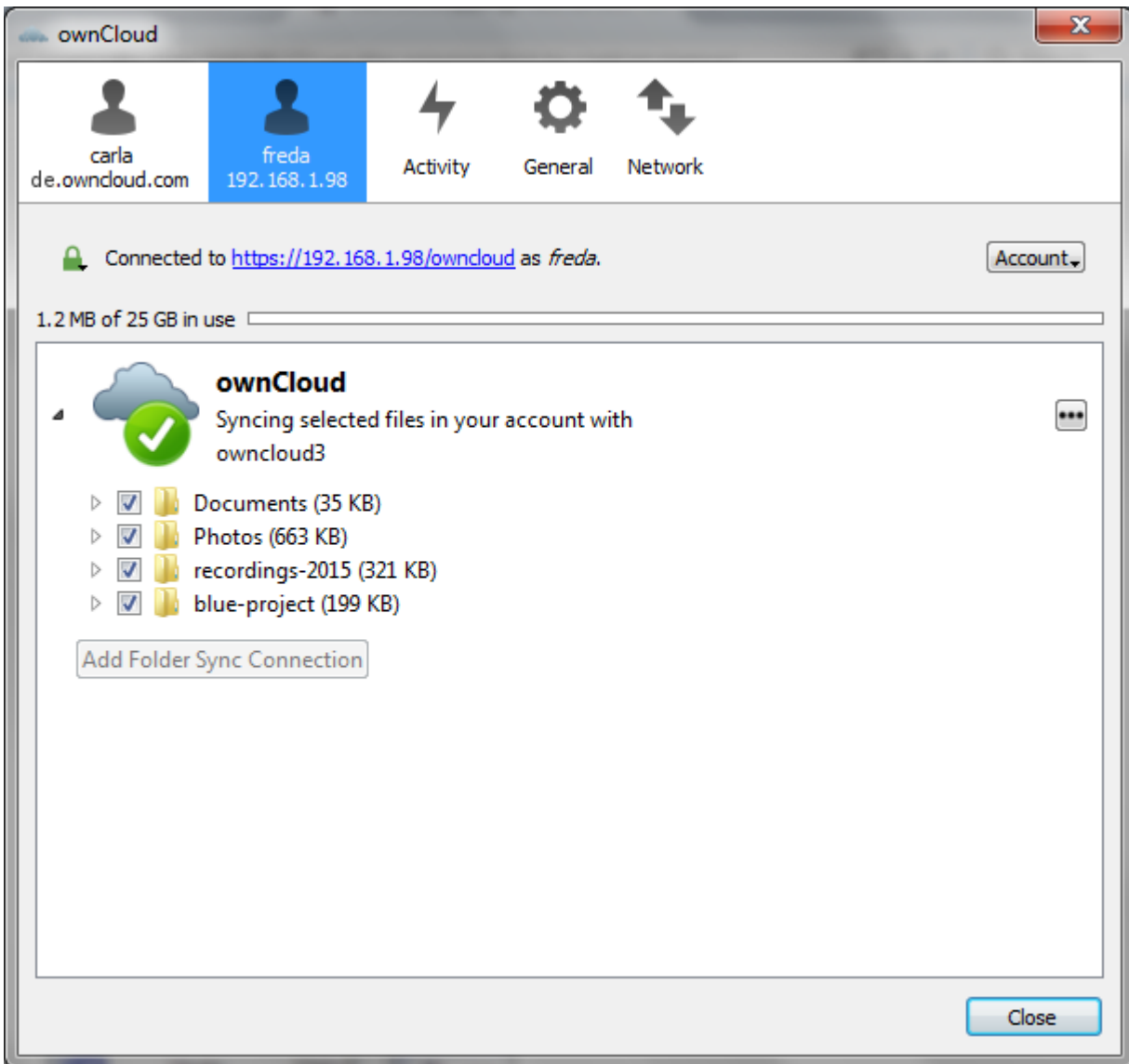
This menu provides the following options:

- Quick access to your accounts
- Recent Changes, showing latest activities



- Status of your client version (whether it is up to date)
- Help menu
- An option to log in or log out of all of your accounts at once
- Quit ownCloud

A left-click on your systray icon opens the desktop client to the account settings window.



### 3.1.1 Configuring ownCloud Account Settings

At the top of the window are tabs for each configured sync account, and three others for Activity, General and Network settings. On your account tabs you have the following features:

- Connection status, showing which ownCloud server you are connected to, and your ownCloud username.
- An **Account** button, which contains a dropdown menu with **Add New**, **Sign In/Sign Out**, and **Remove**.

- Used and available space on the server.
- Current synchronization status.
- **Add Folder Sync Connection** button, which is active only when you have removed synchronization on an account (see **Remove Sync** below).

The little button with three dots (the overflow menu) that sits to the right of the sync status bar offers four additional options:

- Open Folder
- Choose What to Sync
- Pause Sync / Resume Sync
- Remove folder sync connection

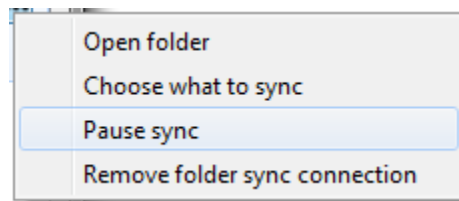
**Open Folder** opens a file explorer window displaying the client-side folder that is being synced.

**Choose What to Sync** opens the folder sync tree view. Use this to sync all or only some of the folders in the folder tree.

**Pause Sync** pauses sync operations without making any changes to your account. It will continue to update file and folder lists, without downloading or updating files. To stop all sync activity use **Remove Sync**.

**Resume Sync** resumes sync operations.

**Remove Sync** removes the sync connection without removing the account. This stops all sync activity, including file and folder list updates. If you want to synchronize the folder tree again then click the **Add Folder Sync Connection** button, and re-select the folder tree that you want to sync.



---

**Note:** ownCloud does not preserve the mtime (modification time) of directories, though it does update the mtimes on files. See [Wrong folder date when syncing](#) for discussion of this.

---

### 3.1.2 Adding New Accounts

You may configure multiple ownCloud accounts in your desktop sync client. Simply click the **Account > Add New** button on any account tab to add a new account, and then follow the account creation wizard. The new account will appear as a new tab in the settings dialog, where you can adjust its settings at any time. Use **Account > Remove** to delete accounts.

## 3.2 Sharing From Your Desktop

The ownCloud desktop sync client integrates with your file manager: Finder on Mac OS X, Explorer on Windows, and Nautilus on Linux. (Linux users must install the `owncloud-client-nautilus` plugin.) You can create share links, and share with internal ownCloud users the same way as in your ownCloud Web interface.

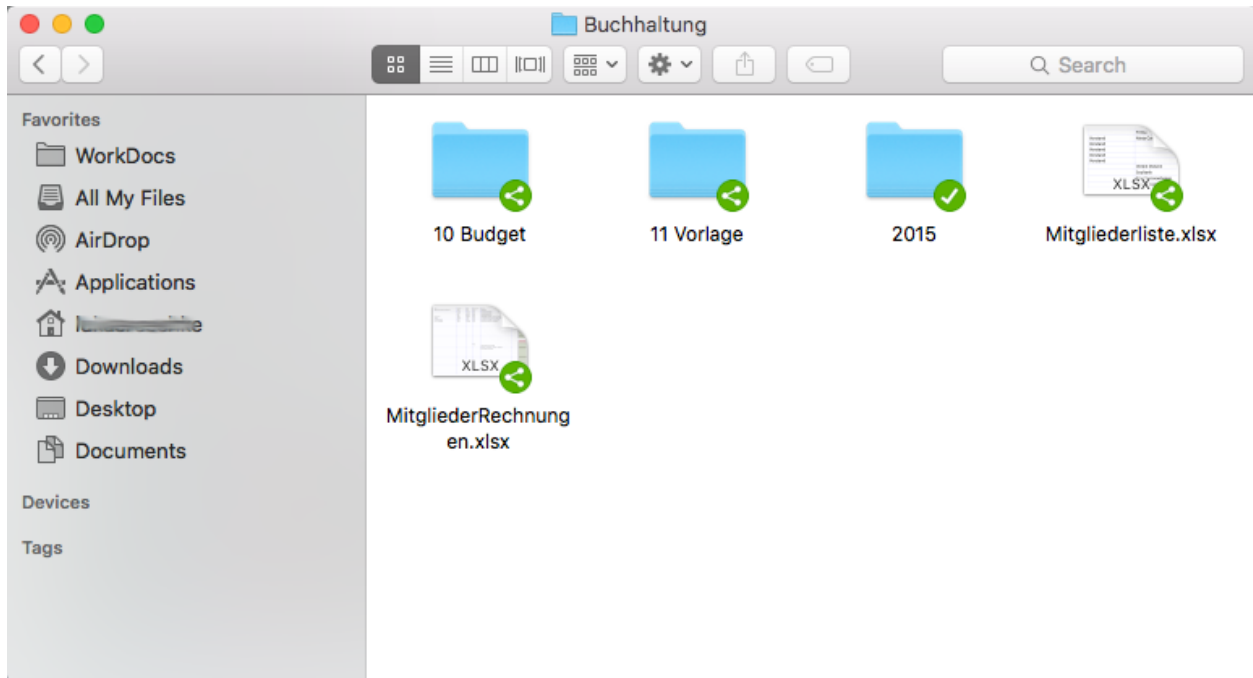
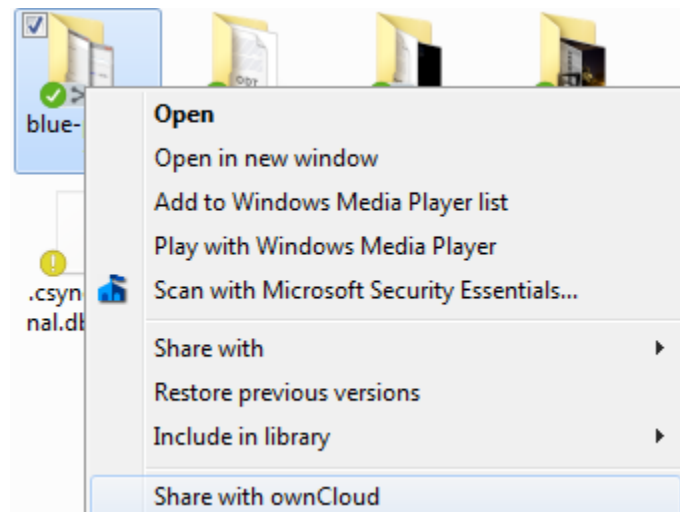


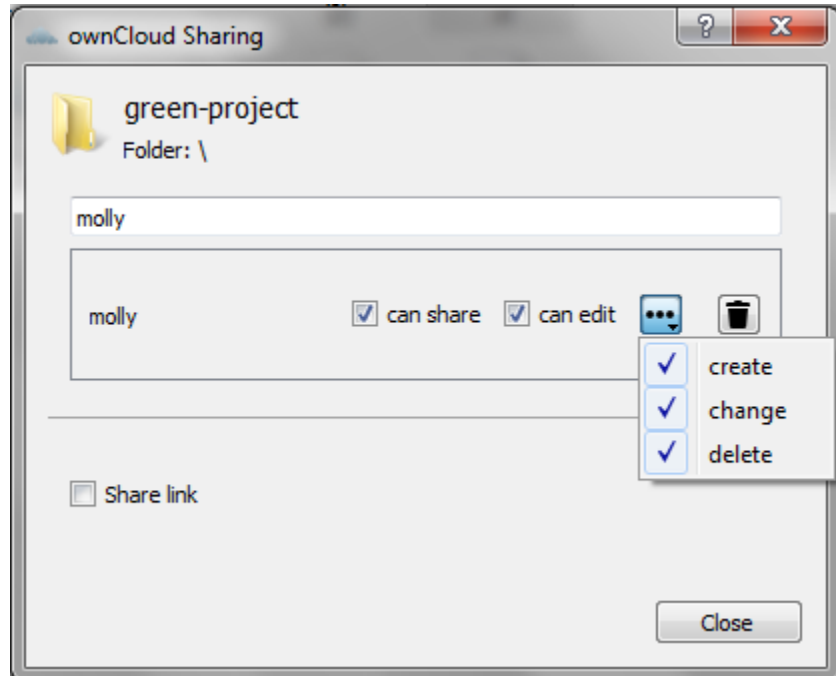
Fig. 3.1: Shared ownCloud files in Finder on Mac OS X

Right-click your systray icon, hover over the account you want to use, and left-click “Open folder [folder name] to quickly enter your local ownCloud folder. Right-click the file or folder you want to share to expose the share dialog, and click **Share with ownCloud**.



The share dialog has all the same options as your ownCloud Web interface.

Use **Share with ownCloud** to see who you have shared with, and to modify their permissions, or to delete the share.



### 3.3 Activity Window

The Activity window contains the log of your recent activities, organized over three tabs: **Server Activities**, which includes new shares and files downloaded and deleted, **Sync Protocol**, which displays local activities such as which local folders your files went into, and **Not Synced** shows errors such as files not synced.

### 3.4 General Window

The General window has configuration options such as **Launch on System Startup**, **Use Monochrome Icons**, and **Show Desktop Notifications**. This is where you will find the **Edit Ignored Files** button, to launch the ignored files editor, and **Ask confirmation before downloading folders larger than [folder size]**.

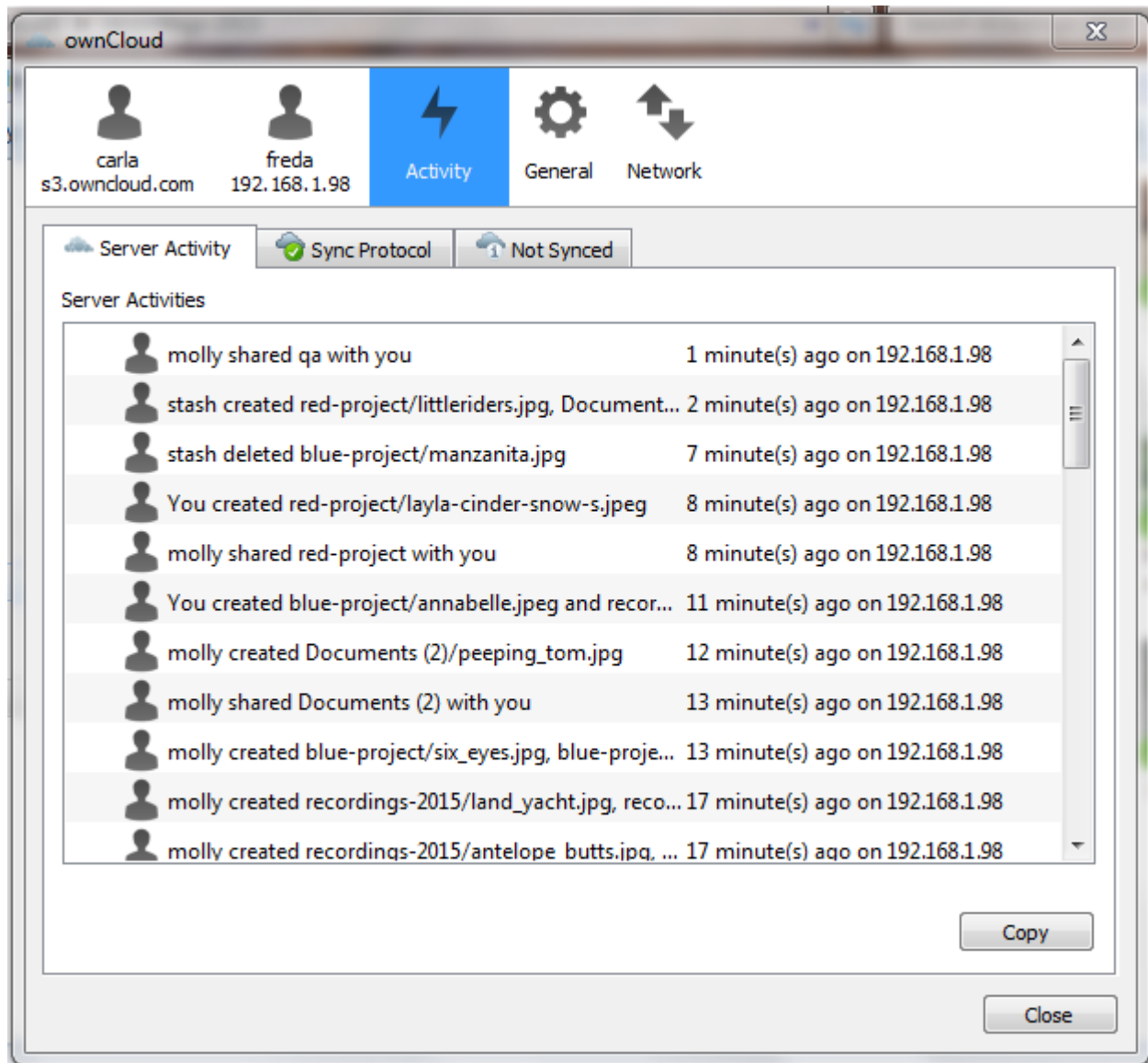
### 3.5 Using the Network Window

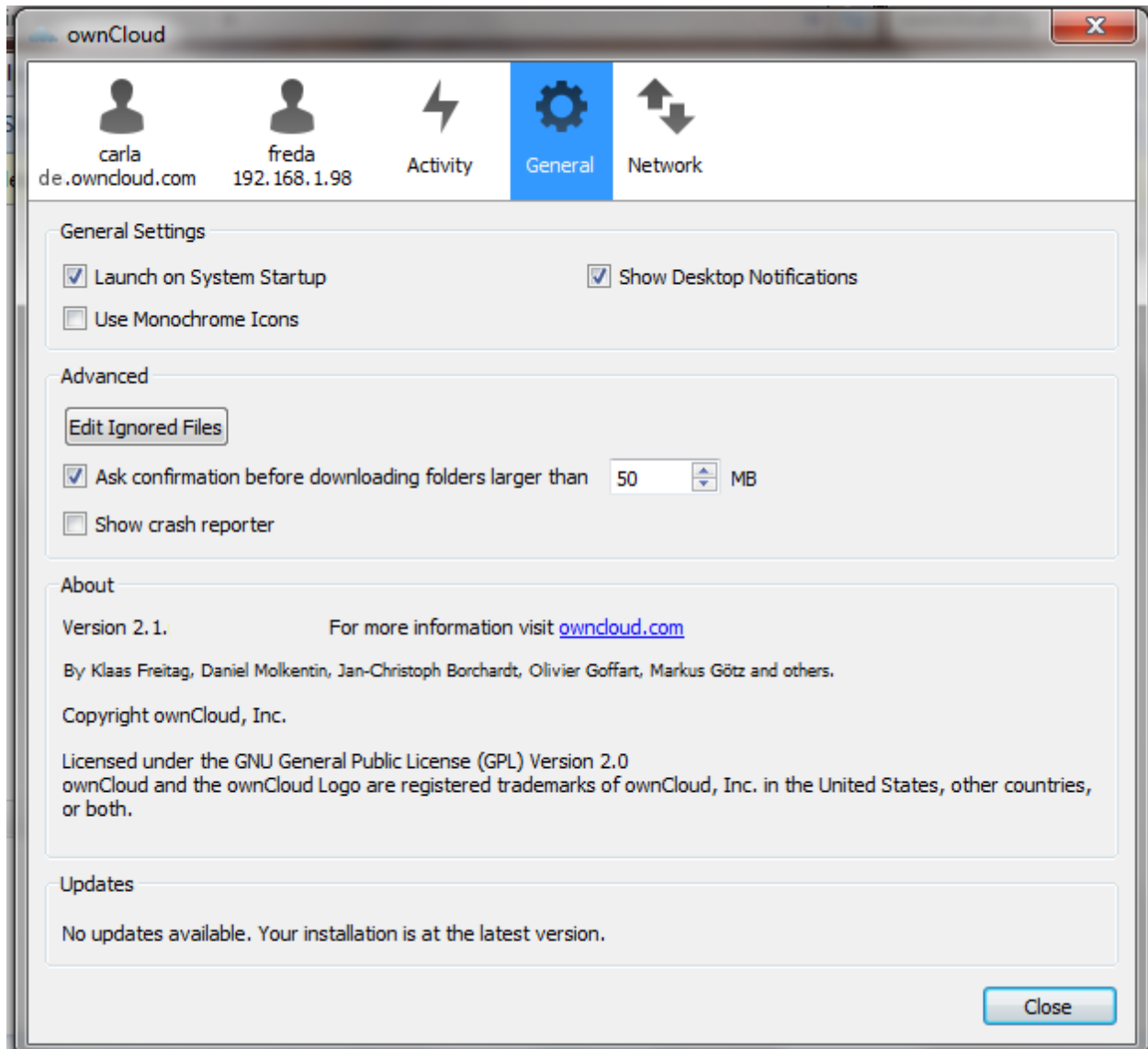
The Network settings window enables you to define network proxy settings, and also to limit download and upload bandwidth.

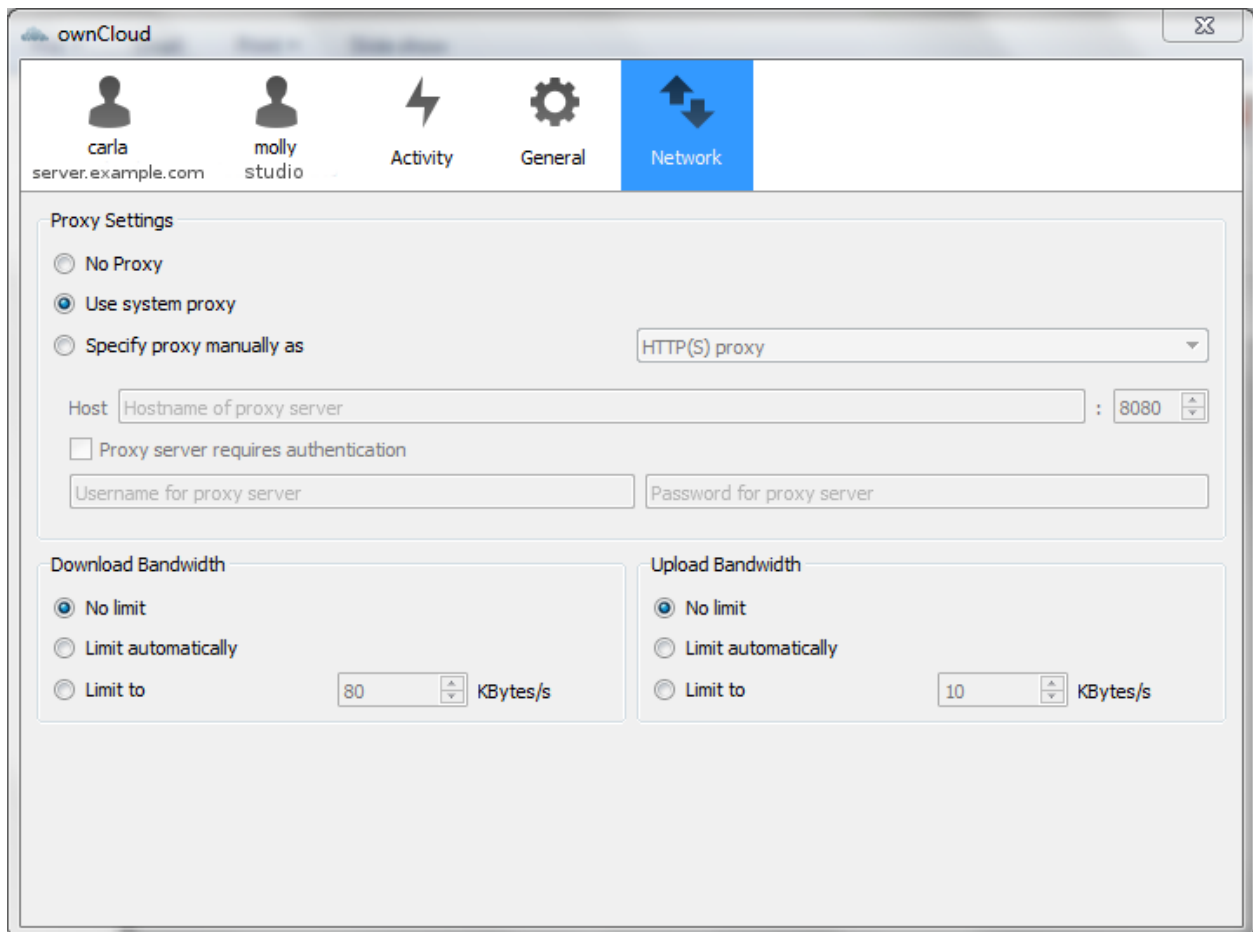
### 3.6 Using the Ignored Files Editor

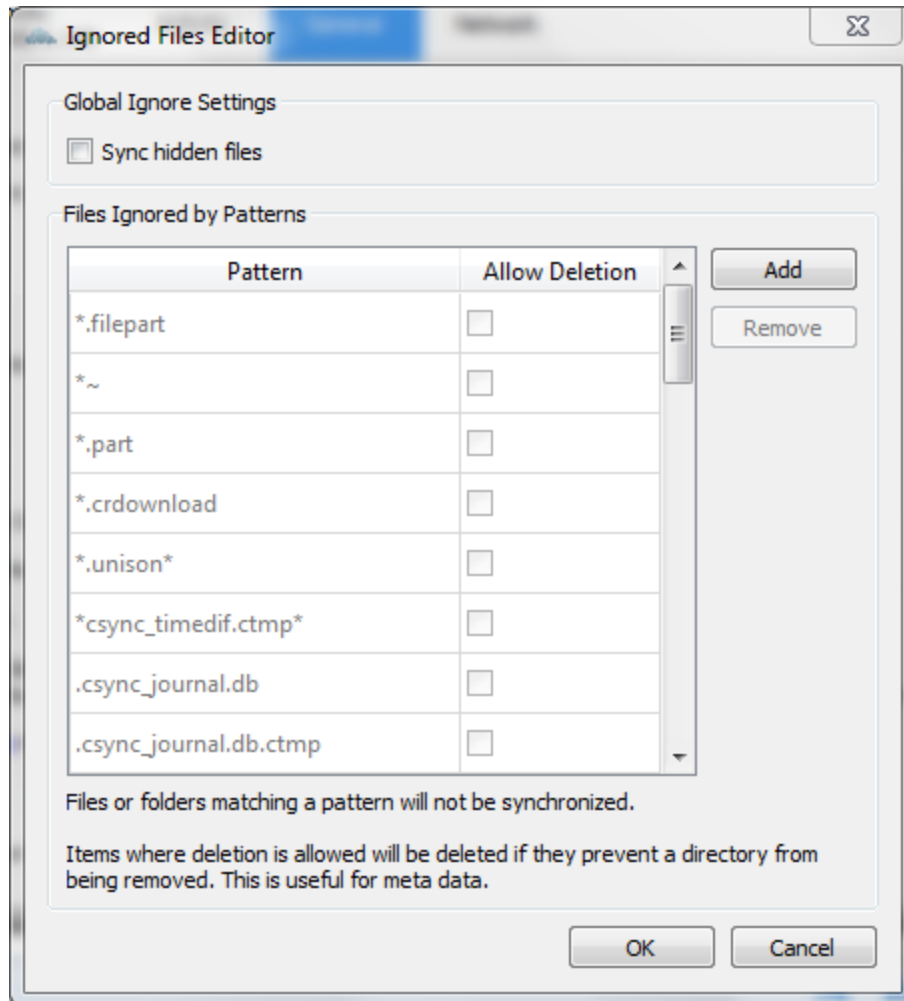
You might have some local files or directories that you do not want to backup and store on the server. To identify and exclude these files or directories, you can use the *Ignored Files Editor* (General tab.)

For your convenience, the editor is pre-populated with a default list of typical ignore patterns. These patterns are contained in a system file (typically `sync-exclude.lst`) located in the ownCloud Client application directory. You cannot modify these pre-populated patterns directly from the editor. However, if necessary, you can hover









over any pattern in the list to show the path and filename associated with that pattern, locate the file, and edit the `sync-exclude.lst` file.

---

**Note:** Modifying the global exclude definition file might render the client unusable or result in undesired behavior.

---

Each line in the editor contains an ignore pattern string. When creating custom patterns, in addition to being able to use normal characters to define an ignore pattern, you can use wildcard characters for matching values. As an example, you can use an asterisk (\*) to identify an arbitrary number of characters or a question mark (?) to identify a single character.

Patterns that end with a slash character (/) are applied to only directory components of the path being checked.

---

**Note:** Custom entries are currently not validated for syntactical correctness by the editor, so you will not see any warnings for bad syntax. If your synchronization does not work as you expected, check your syntax.

---

Each pattern string in the list is preceded by a checkbox. When the check box contains a check mark, in addition to ignoring the file or directory component matched by the pattern, any matched files are also deemed “fleeting metadata” and removed by the client.

In addition to excluding files and directories that use patterns defined in this list:

- The ownCloud Client always excludes files containing characters that cannot be synchronized to other file systems.
- Files are removed that cause individual errors three times during a synchronization. However, the client provides the option of retrying a synchronization three additional times on files that produce errors.

For more detailed information see *Ignored Files*.



## ADVANCED USAGE

### 4.1 Options

You have the option of starting your ownCloud desktop client with the `owncloud` command. The following options are supported:

**`owncloud -h` or `owncloud --help`** Displays all command options.

The other options are:

**`--logwindow`** Opens a window displaying log output.

**`--logfile <filename>`** Write log output to the file specified. To write to stdout, specify `-` as the filename.

**`--logdir <name>`** Writes each synchronization log output in a new file in the specified directory.

**`--logexpire <hours>`** Removes logs older than the value specified (in hours). This command is used with `--logdir`.

**`--logflush`** Clears (flushes) the log file after each write action.

**`--confdir <dirname>`** Uses the specified configuration directory.

### 4.2 Configuration File

The ownCloud Client reads a configuration file. You can locate this configuration file as follows:

**On Linux distributions:** `$HOME/.local/share/data/ownCloud/owncloud.cfg`

**On Microsoft Windows systems:** `%LOCALAPPDATA%\ownCloud\owncloud.cfg`

**On MAC OS X systems:** `$HOME/Library/Application Support/ownCloud`

The configuration file contains settings using the Microsoft Windows `.ini` file format. You can overwrite changes using the ownCloud configuration dialog.

---

**Note:** Use caution when making changes to the ownCloud Client configuration file. Incorrect settings can produce unintended results.

---

You can change the following configuration settings (must be under the `[ownCloud]` section)

- `remotePollInterval` (default: 30000) – Specifies the poll time for the remote repository in milliseconds.
- `maxLogLines` (default: 20000) – Specifies the maximum number of log lines displayed in the log window.

## 4.3 ownCloud Command Line Client

The ownCloud Client packages contain a command line client, `owncloudcmd`, that can be used to synchronize ownCloud files to client machines.

`owncloudcmd` performs a single *sync run* and then exits the synchronization process. In this manner, `owncloudcmd` processes the differences between client and server directories and propagates the files to bring both repositories to the same state. Contrary to the GUI-based client, `owncloudcmd` does not repeat synchronizations on its own. It also does not monitor for file system changes.

To invoke `owncloudcmd`, you must provide the local and the remote repository URL using the following command:

```
owncloudcmd [OPTIONS...] sourcedir owncloudurl
```

where `sourcedir` is the local directory and `owncloudurl` is the server URL.

Other command line switches supported by `owncloudcmd` include the following:

- user, -u [user]** Use `user` as the login name.
- password, -p [password]** Use `password` as the password.
- n** Use `netrc` (5) for login.
- non-interactive** Do not prompt for questions.
- silent, --s** Inhibits verbose log output.
- trust** Trust any SSL certificate, including invalid ones.
- httpproxy http://[user@pass:]<server>:<port>** Uses `server` as HTTP proxy.
- nonshib** Uses Non Shibboleth WebDAV Authentication
- davpath [path]** Overrides the WebDAV Path with `path`
- exclude [file]** Exclude list file
- unsyncedfolders [file]** File containing the list of unsynced folders (selective sync)
- max-sync-retries [n]** Retries maximum `n` times (defaults to 3)
- h** Sync hidden files, do not ignore them

### 4.3.1 Credential Handling

`owncloudcmd` uses the credentials of the GUI synchronization client. If no client is configured, or if you choose to use a different user to synchronize, you can specify the user password setting with the usual URL pattern. For example:

```
$ owncloudcmd / https://carla:secret@server/owncloud/remote.php/webdav/
```

To synchronize the ownCloud directory `Music` to the local directory `media/music`, through a proxy listening on port 8080, and on a gateway machine using IP address 192.168.178.1, the command line would be:

```
$ owncloudcmd --httpproxy http://192.168.178.1:8080 \  
    $HOME/media/music \  
    https://server/owncloud/remote.php/webdav/Music
```

`owncloudcmd` will prompt for the user name and password, unless they have been specified on the command line or `-n` has been passed.

## THE AUTOMATIC UPDATER

The Automatic Updater ensures that you always have the latest features and bugfixes for your ownCloud synchronization client.

The Automatic Updater updates only on Mac OS X and Windows computers; Linux users only need to use their normal package managers. However, on Linux systems the Updater will check for updates and notify you when a new version is available.

---

**Note:** Because of various technical issues, desktop sync clients older than 1.7 will not be allowed to connect and sync with the ownCloud 8.1+ server. It is highly recommended to keep your client updated.

---

### 5.1 Basic Workflow

The following sections describe how to use the Automatic Updater on different operating systems.

#### 5.1.1 Windows

The ownCloud client checks for updates and downloads them when available. You can view the update status under `Settings -> General -> Updates` in the ownCloud client.

If an update is available, and has been successfully downloaded, the ownCloud client starts a silent update prior to its next launch and then restarts itself. Should the silent update fail, the client offers a manual download.

---

**Note:** Administrative privileges are required to perform the update.

---

#### 5.1.2 Mac OS X

If a new update is available, the ownCloud client initializes a pop-up dialog to alert you of the update and requesting that you update to the latest version. Due to their use of the Sparkle frameworks, this is the default process for Mac OS X applications.

#### 5.1.3 Linux

Linux distributions provide their own update tools, so ownCloud clients that use the Linux operating system do not perform any updates on their own. The client will inform you (`Settings -> General -> Updates`) when an update is available.

## 5.2 Preventing Automatic Updates

In controlled environments, such as companies or universities, you might not want to enable the auto-update mechanism, as it interferes with controlled deployment tools and policies. To address this case, it is possible to disable the auto-updater entirely. The following sections describe how to disable the auto-update mechanism for different operating systems.

### 5.2.1 Preventing Automatic Updates in Windows Environments

Users may disable automatic updates by adding this line to the [General] section of their `owncloud.cfg` files:

```
skipUpdateCheck=true
```

Windows administrators have more options for preventing automatic updates in Windows environments by using one of two methods. The first method allows users to override the automatic update check mechanism, whereas the second method prevents any manual overrides.

To prevent automatic updates, but allow manual overrides:

1. Edit these Registry keys:
  - (a) (32-bit-Windows) `HKEY_LOCAL_MACHINE\Software\ownCloud\ownCloud`
  - (b) (64-bit-Windows) `HKEY_LOCAL_MACHINE\Software\Wow6432Node\ownCloud\ownCloud`
2. Add the key `skipUpdateCheck` (of type `DWORD`).
3. Specify a value of 1 to the machine.

To manually override this key, use the same value in `HKEY_CURRENT_USER`.

To prevent automatic updates and disallow manual overrides:

1. Edit this Registry key:  
`HKEY_LOCAL_MACHINE\Software\Policies\ownCloud\ownCloud`
2. Add the key `skipUpdateCheck` (of type `DWORD`).
3. Specify a value of 1 to the machine.

### 5.2.2 Preventing Automatic Updates in Mac OS X Environments

You can disable the automatic update mechanism in Mac OS X operating systems using the system-wide `.plist` file. To access this file:

1. Go to this directory:

```
/Library/Preferences/
```

2. Locate and open the following file:

```
com.owncloud.desktopclient.plist
```

3. Add a new root level item of type `bool`.
4. Name the item `skipUpdateCheck`.
5. Set the item to `true`.

Alternatively, you can copy the file `owncloud.app/Contents/Resources/deny_autoupdate_com.owncloud.desktopclient.plist` to `/Library/Preferences/com.owncloud.desktopclient.plist`.

### 5.2.3 Preventing Automatic Updates in Linux Environments

Because the Linux client does not provide automatic updating functionality, there is no need to remove the automatic-update check. However, if you want to disable it edit your desktop client configuration file, `$HOME/.local/share/data/ownCloud/owncloud.cfg`. Add this line to the [General] section:

```
skipUpdateCheck=true
```



## APPENDIX A: BUILDING THE CLIENT

This section explains how to build the ownCloud Client from source for all major platforms. You should read this section if you want to develop for the desktop client.

---

**Note:** Build instructions are subject to change as development proceeds. Please check the version for which you want to build.

---

The instructions contained in this topic were updated to work with version 1.7 of the ownCloud Client.

### 6.1 Linux

1. Add the [ownCloud repository](#) from OBS.
2. Install the dependencies (as root, or using `sudo`) using the following commands for your specific Linux distribution:
  - Debian/Ubuntu: `apt-get update; apt-get build-dep owncloud-client`
  - openSUSE: `zypper ref; zypper si -d owncloud-client`
  - Fedora/CentOS: `yum install yum-utils; yum-builddep owncloud-client`
3. Follow the [Generic Build Instructions](#).
4. (Optional) Call `make install` to install the client to the `/usr/local/bin` directory.

### 6.2 Mac OS X

In addition to needing XCode (along with the command line tools), developing in the Mac OS X environment requires extra dependencies. You can install these dependencies through [MacPorts](#) or [Homebrew](#). These dependencies are required only on the build machine, because non-standard libs are deployed in the app bundle.

The tested and preferred way to develop in this environment is through the use of [Homebrew](#). The ownCloud team has its own repository containing non-standard recipes.

To set up your build environment for development using [Homebrew](#):

1. Add the ownCloud repository using the following command:

```
brew tap owncloud/owncloud
```

2. Install any missing dependencies:

```
brew install $(brew deps owncloud-client)
```

3. Add Qt from brew to the path:

```
export PATH=/usr/local/Cellar/qt5/5.x.y/bin/qmake
```

Where `x.z` is the current version of Qt 5 that brew has installed on your machine.

5. For compilation of the client, follow the *Generic Build Instructions*.
6. Install the [Packages](#) package creation tool.
7. In the build directory, run `admin/osx/create_mac.sh <build_dir> <install_dir>`. If you have a developer signing certificate, you can specify its Common Name as a third parameter (use quotes) to have the package signed automatically.

---

**Note:** Contrary to earlier versions, ownCloud 1.7 and later are packaged as a `pkg` installer. Do not call “make package” at any time when compiling for OS X, as this will build a disk image, and will not work correctly.

---

## 6.3 Windows Development Build

If you want to test some changes and deploy them locally, you can build natively on Windows using MinGW. If you want to generate an installer for deployment, please follow *Windows Installer Build (Cross-Compile)* instead.

1. Get the required dependencies:
  - Make sure that you have [CMake](#) and [Git](#).
  - Download the [Qt MinGW](#) package. You will use the MinGW version bundled with it.
  - Download an [OpenSSL Windows Build](#) (the non-“Light” version)
2. Get the [QtKeychain](#) sources as well as the latest versions of the ownCloud client from Git as follows:

```
git clone https://github.com/frankosterfeld/qtkeychain.git
git clone git://github.com/owncloud/client.git
```

3. Open the Qt MinGW shortcut console from the Start Menu
4. Make sure that OpenSSL’s `bin` directory as well as your qtkeychain source directories are in your `PATH`. This will allow CMake to find the library and headers, as well as allow the ownCloud client to find the DLLs at runtime:

```
set PATH=C:\<OpenSSL Install Dir>\bin;%PATH%
set PATH=C:\<qtkeychain Clone Dir>;%PATH%
```

5. Build qtkeychain **directly in the source directory** so that the DLL is built in the same directory as the headers to let CMake find them together through `PATH`:

```
cd <qtkeychain Clone Dir>
cmake -G "MinGW Makefiles" .
mingw32-make
cd ..
```

6. Create the build directory:

```
mkdir client-build
cd client-build
```

7. Build the client:

```
cmake -G "MinGW Makefiles" ../client
mingw32-make
```

**Note:** You can try using `ninja` to build in parallel using `cmake -G Ninja ../client` and `ninja` instead.

**Note:** Refer to the *Generic Build Instructions* section for additional options.

The ownCloud binary will appear in the `bin` directory.

## 6.4 Windows Installer Build (Cross-Compile)

Due to the large number of dependencies, building the client installer for Windows is **currently only officially supported on openSUSE**, by using the MinGW cross compiler. You can set up any currently supported version of openSUSE in a virtual machine if you do not have it installed already.

In order to make setup simple, you can use the provided Dockerfile to build your own image.

1. Assuming you are in the root of the ownCloud Client's source tree, you can build an image from this Dockerfile like this:

```
cd admin/win32/docker
docker build . -t ownCloud-client-win32:<version>
```

Replace `<version>` by the version of the client you are building, e.g. 2.1 for the release of the client that this document describes. If you do not wish to use docker, you can run the commands in `RUN` manually in a shell, e.g. to create your own build environment in a virtual machine.

**Note:** Docker images are specific to releases. This one refers to 2.1. Newer releases may have different dependencies, and thus require a later version of the docker image! Always pick the docker image fitting your release of ownCloud client!

2. From within the source tree Run the docker instance:

```
docker run ownCloud-client-win32:<version> -v "$PWD:/home/jenkins/client" \
  admin/win32/docker/build.sh $(id -u)
```

It will run the build, create an NSIS based installer, as well as run tests. You will find the resulting binary in an newly created `build-win32` subfolder.

If you do not wish to use docker, and ran the `RUN` commands above in a virtual machine, you can run the indented commands in the lower section of `build.sh` manually in your source tree.

4. Finally, you should sign the installer to avoid warnings upon installation. This requires a [Microsoft Authenticode Certificate](#) `opensslsigncode` to sign the installer:

```
opensslsigncode -pkcs12 $HOME/.codesign/packages.pfx -h sha256 \
  -pass yourpass \
  -n "ACME Client" \
  -i "http://acme.com" \
  -ts "http://timestamp.server/" \
  -in ${unsigned_file} \
  -out ${installer_file}
```

for `-in`, use the URL to the time stamping server provided by your CA along with the Authenticode certificate. Alternatively, you may use the official `signtool` utility on Microsoft Windows.

If you're familiar with docker, you can use the version of `osslsigncode` that is part of the docker image.

## 6.5 Generic Build Instructions

Compared to previous versions, building the desktop sync client has become easier. Unlike earlier versions, CSync, which is the sync engine library of the client, is now part of the client source repository and not a separate module.

You can download the desktop sync client from the ownCloud [Client Download Page](#).

To build the most up to date version of the client:

1. Clone the latest versions of the client from [Git](#) as follows:

```
git clone git://github.com/owncloud/client.git
git submodule init
git submodule update
```

2. Create the build directory:

```
mkdir client-build
cd client-build
```

3. Configure the client build:

```
cmake -DCMAKE_BUILD_TYPE="Debug" ../client
```

---

**Note:** You must use absolute paths for the `include` and `library` directories.

---

---

**Note:** On Mac OS X, you need to specify `-DCMAKE_INSTALL_PREFIX=target`, where `target` is a private location, i.e. in parallel to your build dir by specifying `../install`.

---

4. Call `make`.

The `owncloud` binary will appear in the `bin` directory.

The following are known `cmake` parameters:

- **QTKEYCHAIN\_LIBRARY=/path/to/qtkeychain.dylib -DQTKEYCHAIN\_INCLUDE\_DIR=/path/to/qtkeychain**  
Used for stored credentials. When compiling with Qt5, the library is called `qt5keychain.dylib`.  
You need to compile QtKeychain with the same Qt version.
- **WITH\_DOC=TRUE:** Creates doc and manpages through running `make`; also adds `install` statements, providing the ability to install using `make install`.
- **CMAKE\_PREFIX\_PATH=/path/to/Qt5.2.0/5.2.0/yourarch/lib/cmake/:** Builds using Qt5.
- **BUILD\_WITH\_QT4=ON:** Builds using Qt4 (even if Qt5 is found).
- **CMAKE\_INSTALL\_PREFIX=path:** Set an install prefix. This is mandatory on Mac OS

## APPENDIX B: HISTORY AND ARCHITECTURE

ownCloud provides desktop sync clients to synchronize the contents of local directories from computers, tablets, and handheld devices to the ownCloud server.

Synchronization is accomplished using `csync`, a bidirectional file synchronizing tool that provides both a command line client as well as a library. A special module for `csync` was written to synchronize with the ownCloud built-in WebDAV server.

The ownCloud Client software is written in C++ using the [Qt Framework](#). As a result, the ownCloud Client runs on Linux, Windows, and MacOS.

### 7.1 The Synchronization Process

The process of synchronization keeps files in two separate repositories the same. When synchronized:

- If a file is added to one repository it is copied to the other synchronized repository.
- When a file is changed in one repository, the change is propagated to any other synchronized repository.
- If a file is deleted in one repository, it is deleted in any other.

It is important to note that the ownCloud synchronization process does not use a typical client/server system where the server is always master. This is a major difference between the ownCloud synchronization process and other systems like a file backup, where only changes to files or folders and the addition of new files are propagated, but these files and folders are never deleted unless explicitly deleted in the backup.

During synchronization, the ownCloud Client checks both repositories for changes frequently. This process is referred to as a *sync run*. In between sync runs, the local repository is monitored by a file system monitoring process that starts a sync run immediately if something was edited, added, or removed.

### 7.2 Synchronization by Time versus ETag

Until the release of ownCloud 4.5 and ownCloud Client 1.1, the ownCloud synchronization process employed a single file property – the file modification time – to decide which file was newer and needed to be synchronized to the other repository.

The *modification timestamp* is part of the files metadata. It is available on every relevant filesystem and is the typical indicator for a file change. Modification timestamps do not require special action to create, and have a general meaning. One design goal of `csync` is to not require a special server component. This design goal is why `csync` was chosen as the backend component.

To compare the modification times of two files from different systems, csync must operate on the same base. Before ownCloud Client version 1.1.0, csync required both device repositories to run on the exact same time. This requirement was achieved through the use of enterprise standard [NTP time synchronization](#) on all machines.

Because this timing strategy is rather fragile without the use of NTP, ownCloud 4.5 introduced a unique number (for each file?) that changes whenever the file changes. Although this number is a unique value, it is not a hash of the file. Instead, it is a randomly chosen number, that is transmitted in the [Etag](#) field. Because the file number changes if the file changes, its use is guaranteed to determine if one of the files has changed and, thereby, launching a synchronization process.

---

**Note:** ownCloud Client release 1.1 and later requires file ID capabilities on the ownCloud server. Servers that run with release earlier than 4.5.0 do not support using the file ID functionality.

---

Before the 1.3.0 release of the Desktop Client, the synchronization process might create false conflict files if time deviates. Original and changed files conflict only in their timestamp, but not in their content. This behaviour was changed to employ a binary check if files differ.

Like files, directories also hold a unique ID that changes whenever one of the contained files or directories is modified. Because this is a recursive process, it significantly reduces the effort required for a synchronization cycle, because the client only analyzes directories with a modified ID.

The following table outlines the different synchronization methods used, depending on server/client combination:

Server Version	Client Version	Sync Methods
4.0.x or earlier	1.0.5 or earlier	Time Stamp
4.0.x or earlier	1.1 or later	n/a (incompatible)
4.5 or later	1.0.5 or earlier	Time Stamp
4.5 or later	1.1 or later	File ID, Time Stamp

We strongly recommend using ownCloud Server release 4.5 or later when using ownCloud Client 1.1 or later. Using an incompatible time stamp-based synchronization mechanism can lead to data loss in rare cases, especially when multiple clients are involved and one utilizes a non-synchronized NTP time.

## 7.3 Comparison and Conflict Cases

As mentioned above, during a *sync run* the client must first detect if one of the two repositories have changed files. On the local repository, the client traverses the file tree and compares the modification time of each file with an expected value stored in its database. If the value is not the same, the client determines that the file has been modified in the local repository.

---

**Note:** On the local side, the modification time is a good attribute to use for detecting changes, because the value does not depend on time shifts and such.

---

For the remote (that is, ownCloud server) repository, the client compares the ETag of each file with its expected value. Again, the expected ETag value is queried from the client database. If the ETag is the same, the file has not changed and no synchronization occurs.

In the event a file has changed on both the local and the remote repository since the last sync run, it can not easily be decided which version of the file is the one that should be used. However, changes to any side will not be lost. Instead, a *conflict case* is created. The client resolves this conflict by creating a conflict file of the older of the two files and saving the newer file under the original file name. Conflict files are always created on the client and never on the server. The conflict file uses the same name as the original file, but is appended with the timestamp of the conflict detection.

## 7.4 Ignored Files

The ownCloud Client supports the ability to exclude or ignore certain files from the synchronization process. Some system wide file patterns that are used to exclude or ignore files are included with the client by default and the ownCloud Client provides the ability to add custom patterns.

By default, the ownCloud Client ignores the following files:

- Files matched by one of the patterns defined in the Ignored Files Editor
- Files containing characters that do not work on certain file systems ( ``\, /, :, ?, *, ", >, <, | `` ).
- Files starting with `.csync_journal.db`, as these files are reserved for journalling.

If a pattern selected using a checkbox in the *ignoredFilesEditor-label* (or if a line in the exclude file starts with the character `]` directly followed by the file pattern), files matching the pattern are considered *fleeting meta data*. These files are ignored and *removed* by the client if found in the synchronized folder. This is suitable for meta files created by some applications that have no sustainable meaning.

If a pattern ends with the forwardslash (`/`) character, only directories are matched. The pattern is only applied for directory components of filenames selected using the checkbox.

To match filenames against the exclude patterns, the unix standard C library function `fnmatch` is used. This process checks the filename against the specified pattern using standard shell wildcard pattern matching. For more information, please refer to [The opengroup website](#).

The path that is checked is the relative path under the sync root directory.

### Pattern and File Match Examples:

Pattern	File Matches
<code>~\$*</code>	<code>~\$foo</code> , <code>~\$example.doc</code>
<code>fl?p</code>	<code>flip</code> , <code>flap</code>
<code>moo/</code>	<code>map/moo/</code> , <code>moo/</code>

## 7.5 The Sync Journal

The client stores the ETag number in a per-directory database, called the *journal*. This database is a hidden file contained in the directory to be synchronized.

If the journal database is removed, the ownCloud Client CSync backend rebuilds the database by comparing the files and their modification times. This process ensures that both server and client are synchronized using the appropriate NTP time before restarting the client following a database removal.

Pressing `F5` while in the Account Settings Dialog enables you to “reset” the journal. This function can be used to recreate the journal database.

---

**Note:** We recommend that you use this function only when advised to do so by ownCloud support staff.

---

## 7.6 Custom WebDAV Properties

In the communication between client and server a couple of custom WebDAV properties were introduced. They are either needed for sync functionality or help have a positive effect on synchronization performance.

This chapter describes additional xml elements which the server returns in response to a successful `PROPFIND` request on a file or directory. The elements are returned in the namespace `oc`.

## 7.7 Server Side Permissions

The XML element `<oc:permissions>` represents the permission- and sharing state of the item. It is a list of characters, and each of the chars has a meaning as outlined in the table below:

Code	Resource	Description
S	File or Folder	is shared
R	File or Folder	can share (includes reshare)
M	File or Folder	is mounted (like on DropBox, Samba, etc.)
W	File	can write file
C	Folder	can create file in folder
K	Folder	can create folder (mkdir)
D	File or Folder	can delete file or folder
N	File or Folder	can rename file or folder
V	File or Folder	can move file or folder

Example:

```
<oc:permissions>RDNVCK</oc:permissions>
```

## 7.8 File- or Directory Size

The XML element `<oc:size>` represents the file- or directory size in bytes. For directories, the size of the whole file tree underneath the directory is accumulated.

Example:

```
<oc:size>2429176697</oc:size>
```

## 7.9 FileID

The XML element `<oc:id>` represents the so called file ID. It is a non volatile string id that stays constant as long as the file exists. It is not changed if the file changes or is renamed or moved.

Example:

```
<oc:id>00000020oc5cfy6qqizm</oc:id>
```

## APPENDIX C: TROUBLESHOOTING

The following two general issues can result in failed synchronization:

- The server setup is incorrect.
- The client contains a bug.

When reporting bugs, it is helpful if you first determine what part of the system is causing the issue.

### 8.1 Identifying Basic Functionality Problems

**Performing a general ownCloud Server test** The first step in troubleshooting synchronization issues is to verify that you can log on to the ownCloud web application. To verify connectivity to the ownCloud server try logging in via your Web browser.

If you are not prompted for your username and password, or if a red warning box appears on the page, your server setup requires modification. Please verify that your server installation is working correctly.

**Ensure the WebDAV API is working** If all desktop clients fail to connect to the ownCloud Server, but access using the Web interface functions properly, the problem is often a misconfiguration of the WebDAV API.

The ownCloud Client uses the built-in WebDAV access of the server content. Verify that you can log on to ownClouds WebDAV server. To verify connectivity with the ownCloud WebDAV server:

- Open a browser window and enter the address to the ownCloud WebDAV server.

For example, if your ownCloud instance is installed at `http://yourserver.com/owncloud`, your WebDAV server address is `http://yourserver.com/owncloud/remote.php/webdav`.

If you are prompted for your username and password but, after providing the correct credentials, authentication fails, please ensure that your authentication backend is configured properly.

**Use a WebDAV command line tool to test** A more sophisticated test method for troubleshooting synchronization issues is to use a WebDAV command line client and log into the ownCloud WebDAV server. One such command line client – called `cadaver` – is available for Linux distributions. You can use this application to further verify that the WebDAV server is running properly using `PROPFIND` calls.

As an example, after installing the `cadaver` app, you can issue the `propget` command to obtain various properties pertaining to the current directory and also verify WebDAV server connection.

## 8.2 Isolating other issues

Other issues can affect synchronization of your ownCloud files:

- If you find that the results of the synchronizations are unreliable, please ensure that the folder to which you are synchronizing is not shared with other synchronization applications.
- Synchronizing the same directory with ownCloud and other synchronization software such as Unison, rsync, Microsoft Windows Offline Folders, or other cloud services such as DropBox or Microsoft SkyDrive is not supported and should not be attempted. In the worst case, it is possible that synchronizing folders or files using ownCloud and other synchronization software or services can result in data loss.
- If you find that only specific files are not synchronized, the synchronization protocol might be having an effect. Some files are automatically ignored because they are system files, other files might be ignored because their filename contains characters that are not supported on certain file systems. For more information about ignored files, see `_ignored-files-label`.
- If you are operating your own server, and use the local storage backend (the default), make sure that ownCloud has exclusive access to the directory.

---

**Note:** The data directory on the server is exclusive to ownCloud and must not be modified manually.

---

- If you are using a different file backend on the server, you can try to exclude a bug in the backend by reverting to the built-in backend.
- If you are experiencing slow upload/download speed or similar performance issues be aware that those could be caused by on-access virus scanning solutions, either on the server (like the `files_antivirus` app) or the client.

## 8.3 Log Files

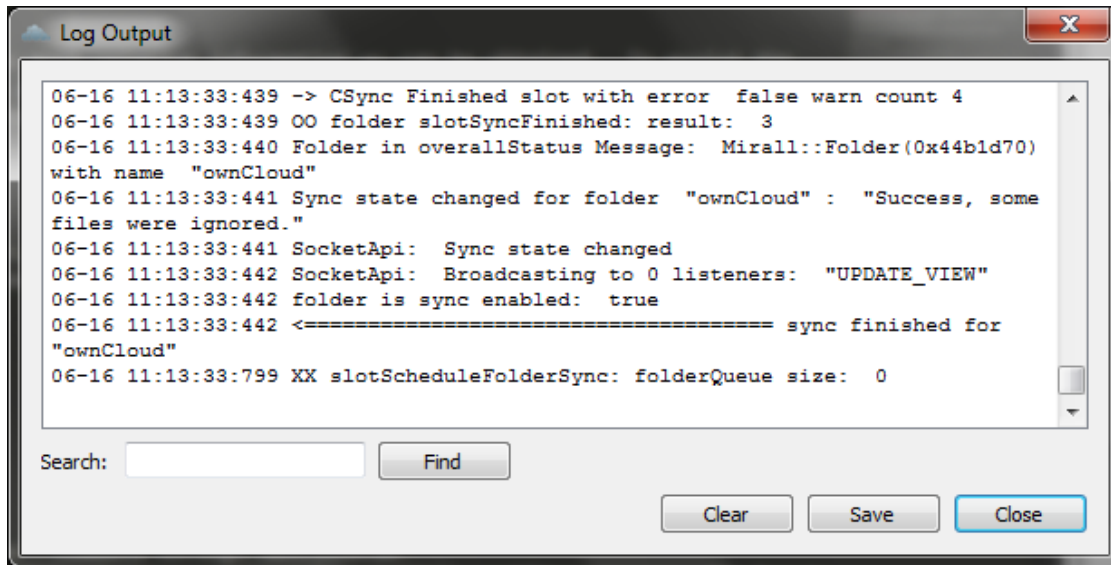
Effectively debugging software requires as much relevant information as can be obtained. To assist the ownCloud support personnel, please try to provide as many relevant logs as possible. Log output can help with tracking down problems and, if you report a bug, log output can help to resolve an issue more quickly.

### 8.3.1 Obtaining the Client Log File

To obtain the client log file:

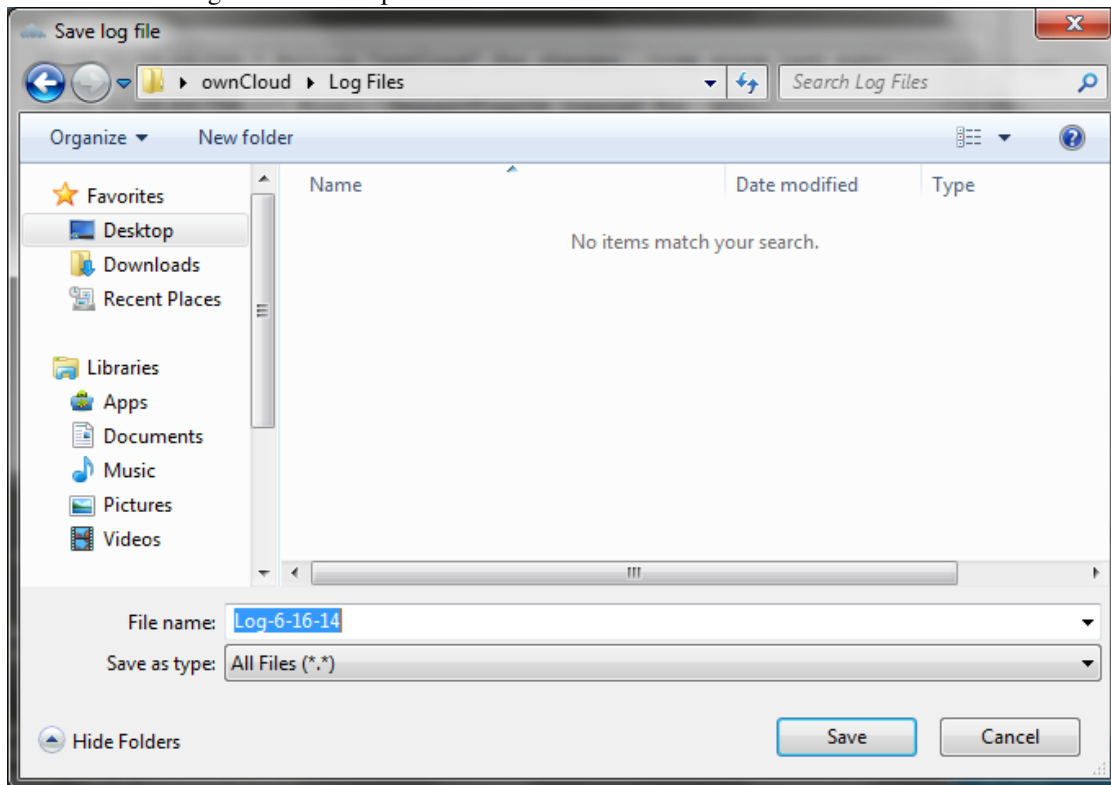
1. Open the ownCloud Desktop Client.
2. Press F12 on your keyboard.

The Log Output window opens.



3. Click the 'Save' button.

The Save Log File window opens.



4. Migrate to a location on your system where you want to save your log file.
5. Name the log file and click the 'Save' button.

The log file is saved in the location specified.

Alternatively, you can launch the ownCloud Log Output window using the `--logwindow` command. After issuing this command, the Log Output window opens to show the current log. You can then follow the same procedures mentioned above to save the log to a file.

---

**Note:** You can also open a log window for an already running session, by restarting the client using the following command:

- Windows: `C:\Program Files (x86)\ownCloud\owncloud.exe --logwindow`
  - Mac OS X: `/Applications/owncloud.app/Contents/MacOS/owncloud --logwindow`
  - Linux: `owncloud --logwindow`
- 

### 8.3.2 Saving Files Directly

The ownCloud client enables you to save log files directly to a predefined file or directory. This is a useful option for troubleshooting sporadic issues as it enables you to log large amounts of data and bypasses the limited buffer settings associated with the log window.

To save log files to a file or a directory:

1. To save to a file, start the client using the `--logfile <file>` command, where `<file>` is the filename to which you want to save the file.
2. To save to a directory, start the client using the `--logdir <dir>` command, where `<dir>` is an existing directory.

When using the `--logdir` command, each sync run creates a new file. To limit the amount of data that accumulates over time, you can specify the `--logexpire <hours>` command. When combined with the `--logdir` command, the client automatically erases saved log data in the directory that is older than the specified number of hours.

As an example, to define a test where you keep log data for two days, you can issue the following command:

```
` owncloud --logdir /tmp/owncloud_logs --logexpire 48 `
```

### 8.3.3 ownCloud server Log File

The ownCloud server also maintains an ownCloud specific log file. This log file must be enabled through the ownCloud Administration page. On that page, you can adjust the log level. We recommend that when setting the log file level that you set it to a verbose level like `Debug` or `Info`.

You can view the server log file using the web interface or you can open it directly from the file system in the ownCloud server data directory.

---

#### Todo

Need more information on this. How is the log file accessed? Need to explore procedural steps in access and in saving this file ... similar to how the log file is managed for the client. Perhaps it is detailed in the Admin Guide and a link should be provided from here. I will look into that when I begin heavily editing the Admin Guide.

---

### 8.3.4 Webserver Log Files

It can be helpful to view your webserver's error log file to isolate any ownCloud-related problems. For Apache on Linux, the error logs are typically located in the `/var/log/apache2` directory. Some helpful files include the following:

- `error_log` – Maintains errors associated with PHP code.

- `access_log` – Typically records all requests handled by the server; very useful as a debugging tool because the log line contains information specific to each request and its result.

You can find more information about Apache logging at <http://httpd.apache.org/docs/current/logs.html>.

## 8.4 Core Dumps

On Mac OS X and Linux systems, and in the unlikely event the client software crashes, the client is able to write a core dump file. Obtaining a core dump file can assist ownCloud Customer Support tremendously in the debugging process.

To enable the writing of core dump files, you must define the `OWNCLOUD_CORE_DUMP` environment variable on the system.

For example:

```
` ONCLOUD_CORE_DUMP=1 owncloud `
```

This command starts the client with core dumping enabled and saves the files in the current working directory.

---

**Note:** Core dump files can be fairly large. Before enabling core dumps on your system, ensure that you have enough disk space to accommodate these files. Also, due to their size, we strongly recommend that you properly compress any core dump files prior to sending them to ownCloud Customer Support.

---



**Issue:**

Some files are continuously uploaded to the server, even when they are not modified.

**Resolution:**

It is possible that another program is changing the modification date of the file.

If the file uses the .eml extension, Windows automatically and continually changes all files, unless you remove `\HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\PropertySystem\PropertyHandle` from the windows registry.

See <http://petersteier.wordpress.com/2011/10/22/windows-indexer-changes-modification-dates-of-eml-files/> for more information.



## GLOSSARY

**mtime, modification time, file modification time** File property used to determine whether the servers' or the clients' file is more recent. Standard procedure in oCC 1.0.5 and earlier, used by oCC 1.1 and later only when no sync database exists and files already exist in the client directory.

**ownCloud Server** The server counter part of ownCloud Client as provided by the ownCloud community.

**ownCloud Sync Client, ownCloud Client** Name of the official ownCloud syncing client for desktop, which runs on Windows, Mac OS X and Linux. It uses the CSync sync engine for synchronization with the ownCloud server.

**unique id, ETag** ID assigned to every file starting with ownCloud server 4.5 and submitted via the HTTP `Etag`. Used to check if files on client and server have changed.



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