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Project Proposal

Overview

One of the most popular and important services resulting from the rise of the cloud in the past few years is that of cloud hosting. Many companies, including Google, Microsoft, Amazon, and Dropbox, offer online storage for massive amounts of files. Remote file storage is far from a new concept, but one of the great conveniences these corporations brought was the concept of "syncing." With the syncing service, a user simply places the files they want on the cloud into a folder, triggering the software to upload and synchronize their remote files with the local ones. The question that many consumers are now asking themselves is "How secure are these services?" Our project hopes to address this question, creating a solution to insecure cloud storage by providing the user complete control over the encryption and storage of their files. The proposed software would operate much like Dropbox or Google Drive, using a synchronizing folder. Instead, however, of simply uploading the file to the remote storage, the system would encrypt it on the local machine using an encryption key only stored locally. In this way, only encrypted files are ever present on the remote file system.

Feasibility

Many of the functions this software will need to do can utilize libraries. Twitter and Facebook's Watchman handles file watching and synchronizing. There are many libraries available for use in encryption. Upload and download can be handled through an API or library. The project is incredibly modular, separate modules can handle encryption, syncing files, and online file management. If needed, more modules and features can be added on to fit a time frame or increase complexity. For example, a GUI or mobile app can be added to the project if time allows.

Specifications

Using Watchman, a Twitter open source project, the user's computer can observe a folder for changes. Watchman is cross-platform and flexible. When Watchman discovers a file has been changed, added, or deleted, it can set off a script. This script can be a C program, Python script, or any other executable format. Using this, we can implement a synchronizing cloud storage. This project is essentially taking an open source twitter project, Watchman, and using it to make functional and useful software.

Preliminary Research

The most complicated parts of this project, encryption and upload/download, have libraries that can be utilized. The complicated part in creating the project will be coming up with a system that can sync files between machines without losing data. It could potentially use a local database (such as sqlite, which could be encrypted and placed on the remote system), or else it could operate off time stamps. Many solutions similar to this project already exist. None of them, however, give complete control to the user or are free. Many bill themselves as more of a backup solution than as cloud storage. SpiderOak comes the closest in concept, but is very expensive and does not offer the ability to upload files to a customized location.