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Web-Based File Hosting and Syncing Service

A Term Project on Network Programming

GitHub Project Link: https://github.com/samuelrobinroy/FileSync

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Abstract

Github link: https://github.com/samuelrobinroy/FileSync.

File synchronization basically means that the files in two or more locations are same and any modification carried out at one place should be updated in other locations. Applications like Dropbox and Bittorrent provide this functionality. Here in this project we have tried to implement a basic application of file synchronisation.

We have implemented a basic web based file synchronisation application. We have made a folder in our desktop and same folder on our server. We have written a java program which when started will check the files in the folder every second and if any of the file is modified or created on the client side will then be transferred to the server.

Client side a java application checks the files in the folder and also starts a TCP transfer on detection of a modified file. Server side we have used PHP to get the list of files and their modification details from the folder to be synchronised.

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Introduction (Motivation / Problem / Project Outline)

File synchronization (or syncing) in computing is the process of ensuring that computer files in two or more locations are updated via certain rules.

In one-way file synchronization, also called mirroring, updated files are copied from a 'source' location to one or more 'target' locations, but no files are copied back to the source location. In two-way file synchronization, updated files are copied in both directions, usually with the purpose of keeping the two locations identical to each other. In this article, the term synchronization refers exclusively to two-way file synchronization.

File synchronization is commonly used for home backups on external hard drives or updating for transport on USB flash drives. BitTorrent Sync, Dropbox and SKYSITE are prominent products. Some backup software, like AOMEI Backupper also support real-time file sync. The automatic process prevents copying already identical files and thus can be faster and save much time versus a manual copy, and is less error prone. However this suffers from the limit that the synchronized files must physically fit in the portable storage device. Synchronization software that only keeps a list of files and the changed files eliminates this problem (e.g. the "snapshot" feature in Beyond Compare or the "package" feature in Synchronize It). It is especially useful for mobile workers, or others that work on multiple computers. Our aim is to create a dropbox similar web based file synchronisation application.

1. Implementation

We have created a folder named FileSync in both our server http://samuelrobinroy.com/np and in our computer desktop. We have written a php script in our server named read.php, which returns a new line separated list of files in the FileSync folder with their last modification date and time.

The program on client when started get the list of files and details from the server and compares it with the client files every second. We have created two hashmaps named client_files and server_files for this purpose. To update server_files, we open a input stream from our server and read the content received. Then we load the list of files from the client folder using java functions. The key of these hashmaps are the filenames and the value will be the last modified time in milliseconds. After updating both the hashmaps, we loop to the client_files and check if the file exists in server_files or if the modification time is greater than that of server_files for any file. We store different files in an array. The files in this array are then transferred and overwritten in the server using a ftp connection.

2. Error and Exception handling

All the network error and exceptions are handled carefully. Proper prompts are made and logs are created for both if the files synced successfully or if the file synchronisation was a failure. We have deduced this method of file synchronisation which on its takes care of many problems.
First the program tries to get the information of the files from server. If there is network issue and the it was not able to fetch the details then it will update the client file details. After that it will try upload the files, if the files are not able to upload, it simply will go to another iteration and will try to do it again. This process will go on until we have a good network and the transfer is successful.

Conclusion

We were able to implement a basic web based file synchronisation application. But still many modifications and improvements can be done in future. Some future work include recursive directory support and starting the application at startup and working in background.

References

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