Assignment #2 - CrumbleUp

Universidade do Porto

Faculdade de Engenharia

FEUP

Mestrado Integrado em Engenharia Informática e Computação

Sistemas Distribuídos

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23 de Abril de 2014

1 Purpose of the Application

The purpose of this application is to improve upon the previous implementation, making it suitable for a business environment. In order to achieve this objective several features will be implemented, strengthening the application security, failure tolerance, speed, network load and making use of the TCP protocol in a local network.

2 Main Features

- Security
  - Peer authentication using encrypted passwords
  - Guaranteed chunk confidentiality, encrypting the data sent from a computer to the network
- Fault tolerance
  - Use of write-ahead logging, so the aplication is able to recover from a crash and execute integrity checks to detect corruption in files
  - Avoidance of corrupted data through cached backups of the active file(s)
- Communication
  - Implementation of the TCP protocol in some cases where not all the peers need to receive the packet(s)
  - Possibility to name the communication channels making use of a DNS
- In addition to this we will implement all the previous requested enhancements
  - Backup: After waiting a random time, a peer will save the chunk in the hardrive only if the current replication degree is lower than the desired degree
  - Restore: Implementation of the TCP protocol to ensure that only the necessary client receives the data requested without fail, putting less strain on the network
  - Delete: Implement a response message to the delete request. This message will allow the host to send the delete request until all the responses indicate the replication degree of this chunk has reached zero.
  - Space Reclaim: Similar to the delete protocol, a list of chunks with low degree will be kept and a request to backup a chunk will be sent to newly connected clients until the replication degree is satisfied.
- Core program functions
  - Backup a file in the network with the desired replication degree
  - Restore a file previously backed up
  - Remove a file previously stored in the network
  - Disk allocation management

3 Target Platforms

- Java standalone application for Windows/Linux/Mac

4 Additional Services and Improvements

If time allows us, we will develop a Graphical User Interface for the main application and an Android port, while also allowing interoperability between all the target platforms.

5 Target

With this project we hope to achieve a final grade of 17 if the Android Version is not implemented and 19 if it is implemented.