

Data Structures Reflection

Online System: OneDrive Cloud Storage

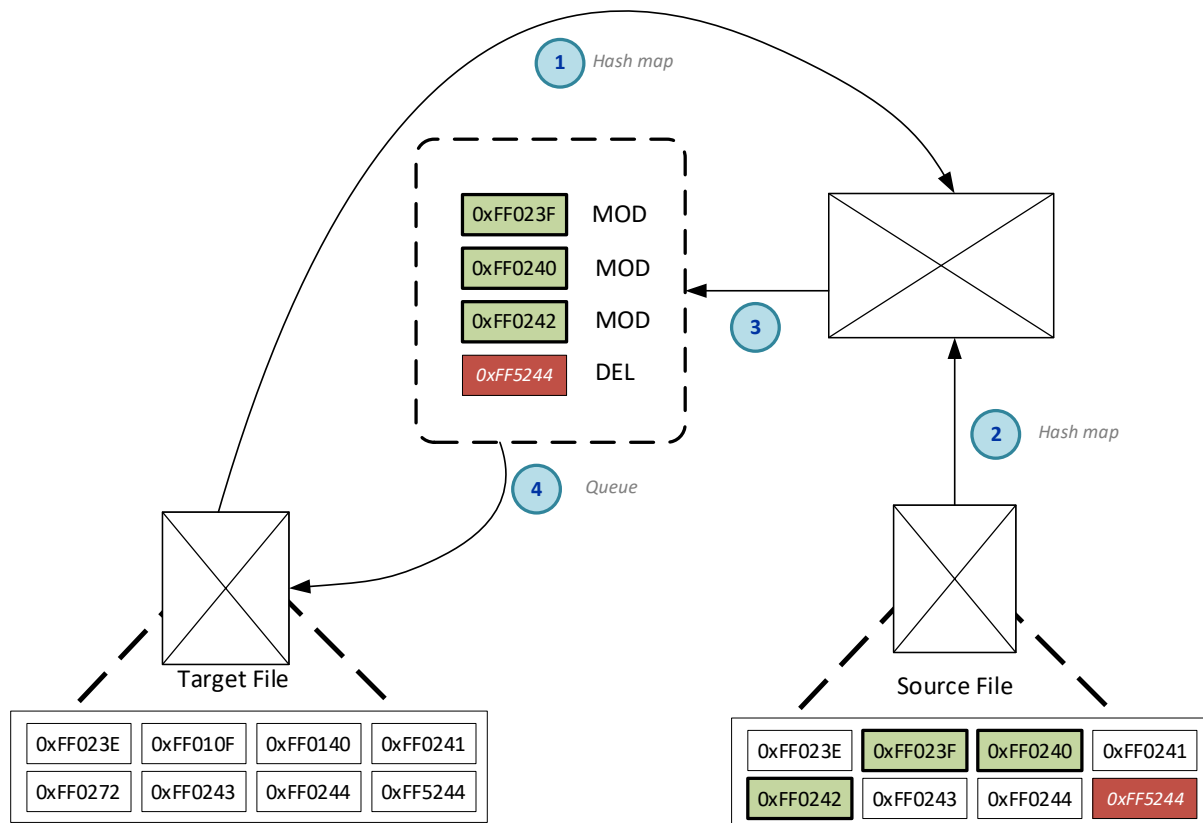


Figure 1 OneDrive data structures conceptualisation (created by author, 2022)

Thinking about Microsoft OneDrive Cloud Storage solution, the following data structure(s) likely are leveraged in the product:

1. HashMap

The product must query the target file on the cloud server to calculate a map of all the hashed blocks contained in the target file. The hashmap contains the hashed value and an associated block number.

The hashmap is utilised by the desktop client to compute the set difference between the target server file and the source file.

2. Sets

The product adds each target hash into a target set, and each source hashed block into a source set. It would then compute the difference between the two sets to determine which source file blocks have changed in relation to the target file.

3. Queues

The product then gathers the source blocks and adds them to a queue on the server. The cloud server then dequeues each entry and writes the changed value to disk.

References

Dicheva, D. & Hodge, A. (2018). Active learning through game play in a data structures course. *Proceedings of the 49th ACM Technical Symposium on Computer Science Education*: 834-839.