**IMPLEMENTATION**

**MODULES:**

* Client
* Metadata Servers
* Storage Servers
* Signature Generation

**MODULES DESCRIPTION:**

**Client**

Client is in charge of pre-processing the users’ data for the purpose of optimization, such as chunking (i.e., dividing files into individual chunks of a maximum size data unit), deduplication (i.e., avoiding storing and re-transmitting the same content already available on the remote servers), delta encoding (i.e., transmission of only modified portions of a file), bundling (i.e., the transmission of multiple small files as a single object) and encryption/decryption;

**Metadata servers**

Metadata servers are used to store the metadata database about the information of files, CSPs and users, which usually are structured data representing the whole cloud file system;

**Storage servers**

Storage servers store the raw data blocks which can be both structured and unstructured data. We use DriveHQ cloud service provider for uploading the data in the Cloud.

**Signature Generation:**

The file’s contents can be uniquely identified by this list of hashes and we call these hashes as signatures. To synchronize the updates to the cloud, the client will firstly send the signatures of current file to the metadata server. Then, the metadata server will detect these modified chunks by comparing current signatures with the signatures of last version and only returns the signatures of these changed chunks to the client. Finally, the client will only upload these chunks with changed signatures to the storage server. In this paper, we design our system based on resync-like protocols and further optimize the system in terms of information leakage.