CS 3326 Project Phase 2

Part 1: Security properties

* **Property 1: *Access.***Access implies that only members of a group *g* can access a file *f* shared within *g*, where access encompasses creation, modification, deletion, and viewing. This means only members of *g* can share files with *g* or see that files shared with *g* exist. Otherwise, any user could access any file in any group, rendering the group-based file sharing system pointless.
* **Property 2: *Authorization*.** Authorization implies that only the owner of a group *g* is able to add/remove users to/from *g*. Otherwise, any user in *g* could add/remove any other user in *g*, which grants unnecessary privileges to too many users. Also, only the owner of g can list all the members of g. This enforces privacy for the members of the group.
* **Property 3: *Association.*** Association implies that when a group *g* is deleted, all files shared within *g* are deleted from the file server. Otherwise, files would persist on the file server after the deletion of *g* without association to any group. This could pose a security risk (potential unauthorized access to the files) and uses storage space. However, if a user account *u* is deleted, any files uploaded by *u* to *g* will continue to be accessible by members of *g*.
* **Property 4:** ***Creation.***Creation implies that any user can create a group *g*, while only an admincan create a user account *u*. This property facilitates the creation of groups for file-sharing while limiting the privileges of ordinary users so that user account creation is supervised.
* **Property 5: *Deletion.*** Deletion implies that only an admin or the creator of a group *g* can delete *g*. Similarly, only an admin can delete a user account *u*. This property guarantees that groups and user accounts cannot be unexpectedly deleted by users who do not have ownership status or admin authorization.
* **Property 6: *Confidentiality.*** Confidentiality implies that uploaded files, user information, and communication between the client and servers will be encrypted. This property ensures that user-created content and user activity will stay private.
* **Property 7: *Integrity.*** Integrity implies that when a file is shared with a group by a user, a hash of the file will be computed and stored securely. This property provides a way for users to check whether their files have been modified.