

- Project Overview:
 - Clients connect to the server, at which point they are prompted to input their username and password. The hash for the password is computed and compared to the one we have stored that is associated with the user. Thus the password is not exposed if the authentication information is exposed. If the hash is correct, the client starts their session. If the information is not correct, the user is prompted to input their information again.
 - Clients are then prompted to input 1 of 5 possible commands:
 - LIST - lists all songs server has for specific user
 - DIFF - displays the songs that are on the client that are not on the server and vice versa
 - PULL - syncs files to server that client has that server does not and syncs files to client that server has that client does not
 - LEAVE - ends client session
 - HELP - lists all commands and their actions
- Paket Structure:
 - 1 byte - type
 - LOGON - 0x0
 - LIST - 0x1
 - PULL - 0x2
 - PUSH - 0x3
 - LEAVE - 0x4
 - 1 byte - length
 - Num of elements in data field
 - Variable length - data
 - Contains all data (files, name:hash pairs, etc)
- LOGON:
 - Handled after TCP connection is set up. The Authorize method handles the verification and, if necessary, promotes re-input of information from clients.
- LIST
 - Client sends a packet with a list request. Server sends back a packet of list type, with x in length field, specifying number of elements in data field. Data field contains name:song_hash pairs.
- DIFF - same as list
 - Diff computation is done on client side using the name:song_hash pairs by computing a set difference
- PULL:
 - User calls pull
 - Diff is performed to determine what songs client should send to server and what songs client should pull from server
 - Client sends push packet of push type, with number of songs to push in length field and name:file_size in data field

- Client sends each file after receiving ack packet from server and an ack after each file is sent
 - Client sends packet of pull type, with number of songs wanted in length, and names of songs in the data field
 - Server sends those files specified back to the user.
- LEAVE: User requests to leave. The socket is closed, and the thread is killed.