CS 427 Project Proposal

Secure Network Program and EXT2

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1. **Motivation and problem:**
   A project created in Systems Programming (CPT_S 360) uses an echo server/client program using UDP. The UDP server creates a socket and sets the server with the following IP and port number defined in the program files. The server side waits for the client to connect to the server, If the port number and server name are known by any user who successfully connects to the server, the client can access the computers file system and able to manipulate all the data. The server side of the system will allow the user to connect to their own disk within the EXT2 file system. The current state of the server-client program violates several STRIDE principles such as Tampering, Information Disclosure, Denial of Service, and Elevation of Privilege. The Server-Client program must be modified where security features are able to deny access to clients who do not possess access to the server if the host name and port number are leaked.

2. **Description of the Contribution:**
   A solution to making the Server-Client model secure would be to implement a Kerberos Protocol that will authenticate each user's file system for all users and passwords connecting to the server. Initially the program does not have a user/password system as the server-client program runs through a default localhost and a fixed port number. Creating a file system that stores all users to access the file system will need to be initially implemented where the passwords use a hash function to store the usernames and passwords to connect to the server. Considering the File System may contain important and personal information, a level 3 authentication factor will be used containing ID proofing, password, and a token. If any security features deem useful or available during milestones, an updated description of contribution will be attached to the milestone report.
3. **Proposed Milestones:**
   Milestone 1: For the first milestone a file system containing the username and password will be implemented. A corresponding disk from an EXT2 file system will be assigned to a user where the user/client is able to use basic Linux commands such as ls, cd, mkdir, rmdir, etc. The hashing function for the passwords will be implemented to ensure safe password storing.

   Milestone 2: For the second milestone, a Kerberos Protocol will be implemented to authenticate each user's EXT2 file system. The Kerberos Protocol will need extensive testing to avoid corrupted disks when trying to connect to the server, avoiding loss of data.

4. **Proposed timeline to accomplish the milestones:**

CS427 Gantt Chart