**Program Design**

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**HW8**

**Problem Statement**

Write the design for the connection-oriented, concurrent download server. Be sure to use the design template discussed in class for your design.

**Analysis**

|  |  |
| --- | --- |
| Inputs | * [port number] – optional port number on command line * “DIR” – retrieves a directory listing * “CD <directory listing>” – change to an absolute or relative directory on the server. * “DOWNLOAD <filename> ” – command to retrieve the specified file and serve to the client. * “READY” – command to send file * “STOP” – command to not send file * “BYE” – client’s last words. |
| Outputs | * “HELLO” – Client connection, send friendly greeting. * <file listing of directory> * “Permission Denied” – security check on specified directory * ”READY” - response if <filename> from download command was found. * “File Not Found” – response if <filename> from download command was not found. * “COMPLETE” – response when EOF is reached from server and sent to client |
| Formulas |  |
| Constraints | User input only to these keywords.  Directory listing needs to be locked down to specified folders.  Block any attempts at injection by limiting character set.  Block any exec calls in user input fields.  Do not name directories exec.  CHMOD public directories to 400 (read, no write, no execute). |
| Assumptions | User knows that READY will overwrite the file if it exists, but we will send a warning message. |

**Design**

Visio Diagram Included in Dropbox.

3 Functions are needed:

* printDir() – To handle the printing of the directories to the client while also determining the end of the directory listing. This will be called by other programs and takes no parameters. Output must be sent to the client.
* changeDir(<directory>) – specified by the client this function will navigate to the specified directory in the mandatory parameter. Validation is needed in two areas:

1) Input validation

2) Permissions on the requested directory.

This function will call printDir() after the navigation is complete and the directory listing will be passed back to the client through printDir.

* dl\_file(<filename>) – requested by the client to download the file specified. Confirm once EOF by sending a message to the client: “COMPLETE”.

Validation:

1. Input – “Invalid Input” for any entry with special characters or non-filename style entries.
2. Filename – if the file is not found in the directory, return “File Not Found” to the client.

**Test Plan**

|  |  |
| --- | --- |
| Input | Expected Output |
| DIR | <file listing of server directory> |
| CD downloads | <file listing of server directory> |
| DOWNLOAD NotTheTalkingDead\_S6E5.mp4 | File Not Found |
| DOWNLOAD testfile | READY |
| READY | COMPLETE |
| BYE | N/A |

**Time Estimates**

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| --- | --- | --- |
| Task | Estimated Time | Actual Time |
| Design | 1 hour | 2 hours |
| Programming | 4 hours |  |
| Debugging | 2 hours |  |
| Testing | 1 hour |  |