Owl Theory Protocol Design

Basic message format

`0x01 0xCMD [0xDATA...0xDATA-N] 0x00`

- 0x01 denotes start of message (SoM)
- Minimum message size is 3 bytes (if no data is included)
- 0xCMD indicates one-byte command code from table in the <u>quick reference</u>.
- **All messages are null-terminated.**

Commands

A swimlane sequence diagram can be found and edited here: https://swimlanes.io/d/UhF7Bk5NL

The sequence diagram is also embedded at the bottom of this document.

Quick Reference

Sent from	Command Code	Command Name	Command Alias
Server	0x02	<u>Data port opened</u>	N/A
Client	0x02	Client Quitting	N/A
Client	0x03	<u>Get</u>	get <path>
Client	0x04	<u>Put</u>	put <path>
Client	0x05	<u>List</u>	ls [path]

Server-to-client

`0x02` **Data port opened**

Sent to client when server has opened an ephemeral port. Contains two bytes of data indicating the port which was opened.

Example: server opens port 32768 = 0x80 0x00

```
SERVER:
 SoM  CMD PORTH PORTL  NUL
0x01 0x02  0x80  0x00 0x00
```

Client-to-server

`0x03` **Get file** `get <path>`

Gets a file from the server and sends it to the client.

After receiving this command, the server should open an ephemeral port and send the port number to the client with command 0x02.

Example for retrieving `helloworld.txt` with server opening ephemeral port at 32768

```
CLIENT:
 SoM  CMD    h    e    l    l    o    w    o    r    l    d    .    t    x    t
NUL
0x01 0x03 0x68 0x65 0x6c 0x6c 0x6f 0x77 0x6f 0x72 0x6c 0x64 0x2e 0x74 0x78 0x74
0x00

SERVER:
 SoM  CMD PORTH PORTL  NUL
0x01 0x02  0x80  0x00 0x00
```

0x04 Put file `put <path>`

Puts a file from to server from the client.

After receiving this command, the server should open an ephemeral port and send the port number to the client with command `0x02`.

Example for retrieving `helloworld.txt` with server opening ephemeral port at 32768

```
CLIENT:
 SoM  CMD    h    e    l    l    o    w    o    r    l    d    .    t    x    t
NUL
0x01 0x04 0x68 0x65 0x6c 0x6c 0x6f 0x77 0x6f 0x72 0x6c 0x64 0x2e 0x74 0x78 0x74
0x00

SERVER:
 SoM  CMD PORTH PORTL  NUL
0x01 0x02  0x80  0x00 0x00
```

0x05 List `ls [path]`

Lists files in a directory, if given. Otherwise, list files at the servers 'root' directory (TBD; this could be a configuration variable, or we could just assume the root directory to be where `server.py` is executing; might be insecure).

After receiving this command, the server should open an ephemeral port and send the port number to the client with command `0x02`.

Example for listing contents of `joshsfiles/` with server opening ephemeral port at 32768

```
CLIENT:
 SoM  CMD    j    o    s    h    s    f    i    l    e    s    /  NUL
0x01 0x05 0x6a 0x6f 0x73 0x68 0x73 0x66 0x69 0x6c 0x65 0x73 0x2f 0x00

SERVER:
 SoM  CMD PORTH PORTL  NUL
0x01 0x02  0x80  0x00 0x00
```

Sequence Diagram

Owl Theory

Client	Control Port	Ephemeral Port

Initial Connection

Client → Control Port: Establish Connection

client should display a prompt at this point indicating a successful connection.

0x03 - Get File

Client → Control Port: 0x03 - Get command

Control Port ⇠ Client: 0x02 - Data port opened

Client → Ephemeral Port: Establish connection

Ephemeral Port → Client: File content

server closes ephemeral socket; transfer complete.

0x04 - Put File

Client → Control Port: 0x04 - Put command

Control Port ⇠ Client: 0x02 - Data port opened

Client → Ephemeral Port: Establish connection

Client → Ephemeral Port: File content

client closes ephemeral socket; transfer complete.

0x05. List Files

Client → Control Port: 0x05 - List command

Control Port ⇠ Client: 0x02 - Data port opened

Client → Ephemeral Port: Open data connection

Ephemeral Port → Client: Content listing (plain ASCII)

server closes ephemeral socket; transfer complete.

display file listing in client's terminal

Client	Control Port	Ephemeral Port