PA1 Design Document

# Introduciton

I have implemented Downloading server/client programs using Python 3.8 with Twisted Library, mainly use Line Oriented Protocol to achieve this.

Twisted is Event Driven Network Library, it provides some facility to simplify the network programming.

I mainly use Twisted to handle TCP stream and Line Oriented communication.

For simplification, commands mode uses only Line Oriented communication.
Download mode use line and raw data mode. Since TCP is stream based connection, you cannot use packets directly. But Line oriented protocol can simply use “\r\n” to separate lines. It is the based model for http.

All commands are in line text mode, using just simple words. Command argument is followed by ‘: ‘.

# Design

They are two major programs which are ‘files_server.py’ and ‘client.py’.
‘files_server.py’ is the server which serve file for downloading.
‘client.py’ is the client which tries to download files from server.

## Server

‘watch’ thread will try to watch the hosted folder files changes.
Uses event driven line orient commands to responses to clients.
Download using thread to read files.

## Client

Client using event driven line oriented TCP. Downloading uses different threads and sockets.

# Limitations

Twisted has only one reactor, make it hard to extend it to use for some complicated situations. Twisted recommends using multi-process to solve this problem. Multi-process programming is much easier than multi-threading programming, especially network programming. Many http servers use multi-process, it is hard to handle complex states in a program. Complexity will explode due to transitions between different states. But some time multi-threading can not be avoided completely.