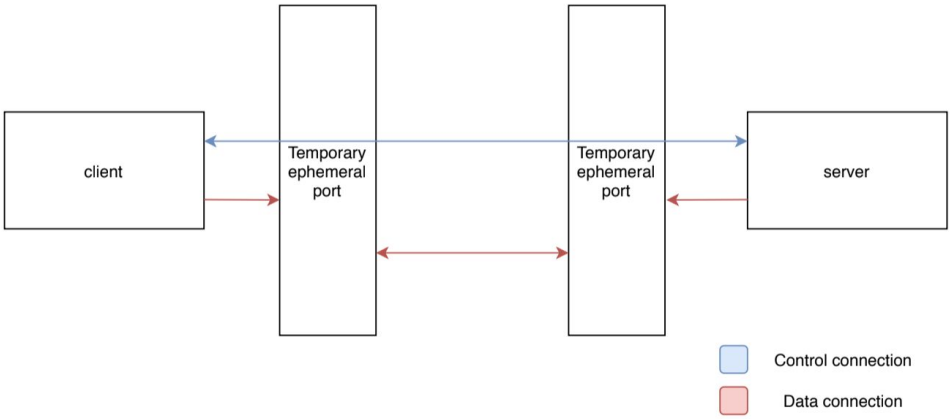
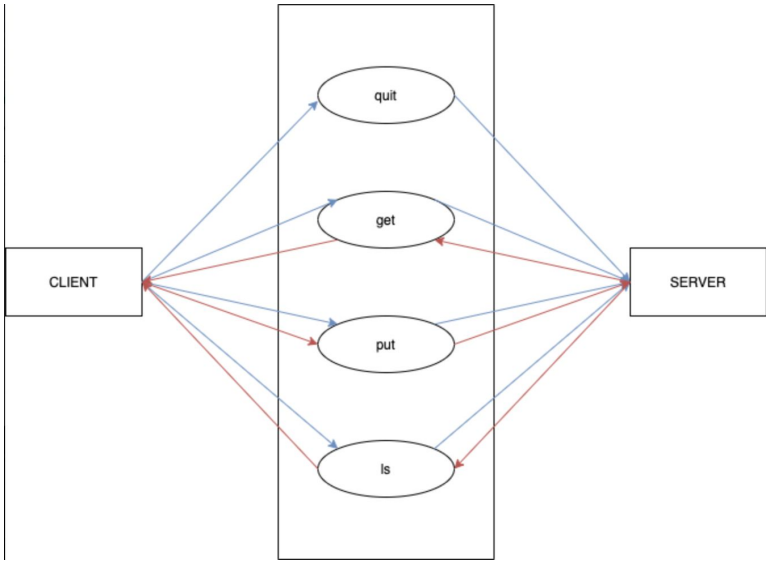
Protocol Design

In order to successfully implement FTP there needs to be two connections established between the client and server. One connection is persistent and is responsible for communication between the client and server. The second connection, known as the data connection, is temporary and is used to transfer the data that is either requested from the server by the client or sent by the client to the server. These connections can be seen in the diagram below.




The client and server communicate through the control connection. This is how the server knows what the client has requested. The client can upload (put) files to the server, download (get) files from the server, list the files on the server (ls), and disconnect from the server (quit). This can be seen in the use case diagram shown below. The blue lines represent the control connection and the red lines represent the temporary data connections.



Each packet that is either sent by the server or the client must include a header. The header contains different information depending on if it was sent through the control connection or data connection. If the client created an ephemeral port, the message length and ephemeral port number are included in the header, otherwise only the message length is included in the header. This is done because the client and server need to know how much data they need to read from the receiving buffer.