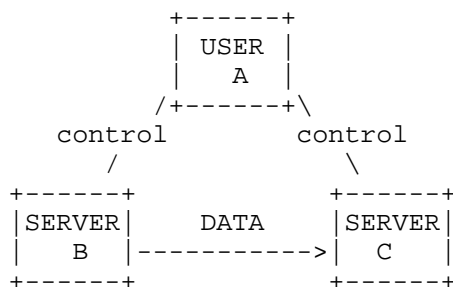   FTP Server-Server Interaction-II

   At the recent FTP meeting at BBN in Cambridge, one of the topics
   discussed was that of server-server interaction. In a typical
   situation a user (A) conversing with two servers (B,C) is interested
   in retrieving a file from one site (B) and sending it to the other
   (C).

                        +------+
                        | USER |
                        | A |
                       /+------+\
                  control   control
                    /   \
            +------+   +------+
            |SERVER| DATA |SERVER|
            | B |----------->| C |
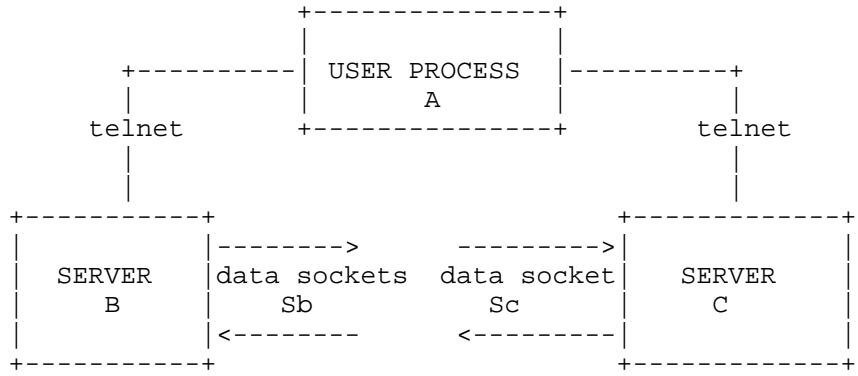   +------+   +------+

   The consensus of the meeting was that mechanisms were necessary to
   make B and C aware of each other and to allow a data connection to be
   established without forcing each other to queue RFCs for local
   sockets before they exist.

   The proposed solution to this problem was a command called PASSIVE
   (PASV?). The following is our conclusion as to the meaning of the
   command and how it would be used.

   Third party connections would be established using the SOCK command,
   which says "Be prepared to use socket S at Host H to establish your
   data connection", and the PASV command which says "open your data
   socket for listening, and upon receipt of a transfer command wait for
   an RFC rather than initiating one."

   A positive acknowledgement to the PASV command indicates that the
   data socket has been opened for listening. When an RFC for its data
   socket arrives after it has positively acknowledged a PASV command,
   the server should respond with a matching RFC to open the data
   connection (assuming, of course, that the incoming RFC is consistent
   with the previous SOCK commands, if any).

```
                    +---------------+
                    |               |
          +---------|  USER PROCESS |----------+
          |         |       A       |          |
       telnet       +---------------+       telnet
          |                                    |
          |                                    |
    +-----------+                         +-------------+
    |           |--------->    --------->|             |
    |  SERVER   |data sockets data socket|    SERVER   |
    |     B     |     Sb         Sc      |       C     |
    |           |<-------      <---------|             |
    +-----------+                         +-------------+
```

USER A TO SERVER B   USER A TO SERVER C
_____   _____

A->B   SOCK HOST-C SKT- Sc   A->C   SOCK HOST-B SKT- Sb

B->A   ACK   C->A   ACK

A->B   PASV

B->A   ACK

A->B   STOR   A->C   RTRV

   1. After the PASV command has been acknowledged, the two data
      transfer commands can be sent in either order, since the
      LISTENING action takes place with the PASV command

   2. The user knows the socket numbers Sc and Sb to be the data
      sockets as specified by the protocol.

   3. Note that it is not essential for a SOCK command to be sent to
      the same Host to whom a PASV will be sent. Sending one to him
      provides security in that the incoming RFC can be checked.

   RB/nlg

        [This RFC was put into machine readable form for entry]
     [into the online RFC archives by Helene Morin, Via Genie 12/1999]