Gnutella Network Protocol

Protocol:

* The code is implemented in Java and using the pdf as reference I have tried to simulate the same.
* Pings and pongs are sent using UDP Protocol using Datagram Sockets.
* Each peer has a directory allocated with files. If directory is not present it is created by the code.
* A ping is sent to all nodes each minute periodically.
* A peer is considered dead when it does not pong to a ping within a 100 seconds of the ping being sent.
* Ping message has same format as the one in the pdf.
* Files are searched and downloaded using TCP Protocol using ServerSocket and Socket classes of Java.
* A file is searched with the file name and time to live as inputs to the program.
* When a query is requested a socket connection is opened between the nodes and the file is sent and size of the file is printed.

Modules:

* GnutellaNetwork:
  + This is the main class where the initial node is started using the port option
  + Other nodes can connect to this node and a ping will be sent as soon as a node is connected.
* SendPing Thread:
  + Maintain a list of peers and check for each peer:
  + If peer has not responded to a ping withing one minute add to deadpeer list
  + Else send ping to all peers in the list
  + Sleep for one minute
* ListenPing Thread:
  + Open socket for listening to request
  + Receive a packet and check length of the packet
  + If packet length is 14 start DataProcess Thread
  + Else start QueryProcess Thread
* DataProcess Thread:
  + Update peer’s timestamp to current system time
  + Forward ping to other peers in the list
* QueryProcess Thread:
  + Check if file exists and if found send it to the requested peer
  + Else if not found forward to other peers in the network
* FileDownloader Thread:
  + Read data from incoming stream
  + Download and save file in the directory