P2P File sharing

* Gnutella
* Bittorrent
* Bootstrap server (Static IP Address) (Multiple)
* Client connect to bootstrap
  + Recive 2-3 random IP-adresses
  + Recives list of published swarms
  + -” “- blacklist (peers must refuse to connect)
  + Validty time of IP 3 min ( not def serer & blacklist)
    - Expired IPs are remove from boots
  + Swarm is removed if no peers
  + same NTP server & timezone
  + Peers periodicaly retrives info from boots
  + if def boots is down try another
  + No bootstrap avalibly -> use current data.
    - If no data show error message on client and give error message and quit
* Peers tries to establish HTTPS connection to IPs recived from bootstrap
  + No commnection -> wait 5 minutes
  + When connected to peer they send 2-3 random IP address that have the file
    - Helps to discover dark peers
  + Maxiumum 3 connectinos per peer
* Bootstrap sync every 1 minute to other bootstraps
  + merge the lists
  + keeps latest validy time
* Peers can create swarms
  + sequence of 1024 blocks (bytes)
  + Last block can be smaller but not 0 bytes
  + Header block (Header + filename is Metadata)
    - message digest (SHA)
    - sequce index
    - block size
    - -------------Filename
    - metadata digest
* public swarms, uploade swarm metadata to bootstrap server
* Engage swarm
  + Connect to seeder
  + obtain metadata
  + request chunck from seeder
  + seeders adds peer IP to “swarm” list
  + When file is downloaded the message digest is computed for the whole file. It happend for eatch block and then for the whole file. Like TCP and checksums
  + if more than one seeder, the peer should downloade more than one chunck simultanosly
* Non-public file content (blocks)
  + Peers can search for such content by filename. the search is broadcasted out to there connected peers and then their peers. There is a hop limit.
  + If a peer has the file it connects to the pper who searched for it and sends metadata.
* GUI
  + uploade and downloade bandwith live
* Encryption - self sign
* Restart system with no encryption
* Swarm
  + A shared file (i.e one)
  + swarm metadata
  + set of seeders, sharing the file
* Dark peer
  + peer that doesn’t talk with bootstrap