P2P Networks – Exercise # 5

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Doodle Poll for

P2P Networks Course Exams

http://www.doodle.com/eg3cdf7sg56h2cya

BitTorrent

Solution for 3rd Exercise

1.1 BitTorrent (P. 2/16)

- How does a client join a torrent network if it has no knowlede about the existing swarm?
  - Search for .torrent that contain tracker details
    - Lengths
    - Name
    - Hashing information
    - Tracker URL

1.2 BitTorrent (P. 5/16)

- Explain how data is identified and sectioned in a torrent network? How does the piece size affect the download performance?
  - Chunks or 'pieces'
  - Hashes of each chunk
  - 'Smaller is better' – bandwidth is used optimally

1.3 BitTorrent (P. 9/16)

- When the client is connected to the swarm, how will it choose what to download, from the first byte till the last byte of the data is downloaded?
  - Strict priority
    - Request all sub-pieces of a piece before starting to download other pieces from the same peer
  - Rarest first strategy
    - Download the rarest pieces in the peer set
  - Random first piece
    - Download all the pieces at random until the download of the first piece is completed
  - End-game – request for all subpieces
    - Request the missing pieces from all other peers

1.4 BitTorrent (P. 12/16) (1/2)

- Explain how a BitTorent client chooses the peers that it will transfer data to it. How does this behaviour change when the client itself has successfully received all the data?
  - Pareto efficiency
    - State, in which a party can only gainif another party looses
    - BitTorrent: local optimization to achieve global optimization w.r.t the amount of distributed data by the tit-for-tat paradigm
  - Choking algorithm
    - Chock: temporal refusal to upload to another peer
    - Unchock only the 4 best uploaders from the peer set
    - Based on the current download rate
    - Recalculate which peer to unchoke every 10 seconds

1.4 BitTorrent (P. 12/16) (2/2)

- Explain how a BitTorent client chooses the peers that it will transfer data to it. How does this behaviour change when the client itself has successfully received all the data?
  - Optimistic unchoking
    - Unchoke a random peer every 30 seconds
    - Independent of the current download rate
  - Anti-snubbing
    - Choke all peers that have not uploaded a chunk the last 60 seconds
  - Upload only
    - When become a seeder, start uploading to the peers with best download speed

1.5 BitTorrent (P. 16/16)

- Explain at least two possibilities for a peer to exploit the BitTorrent protocol that will raise the download rate of a single peer. How are the other peers affected?
  - Fake sub-pieces
    - Integrity check is inclusive
  - Uncooperative peer
    - Claim that you have all the pieces but don't upload them to others
  - Manipulate piece rareness
    - Pretend possession of rare pieces thats lead to their extinction from swarm
  - Eclipse attack
    - Intercept cooperative nodes

Best of luck for 5th exercise