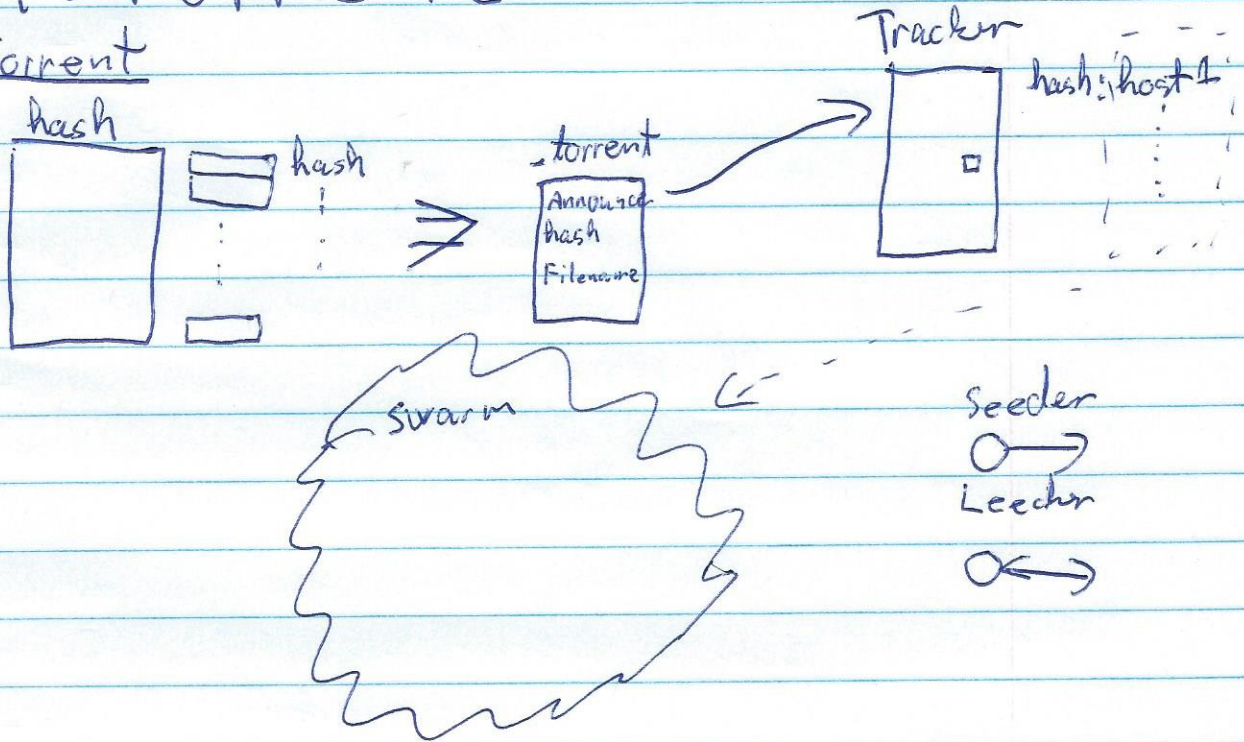
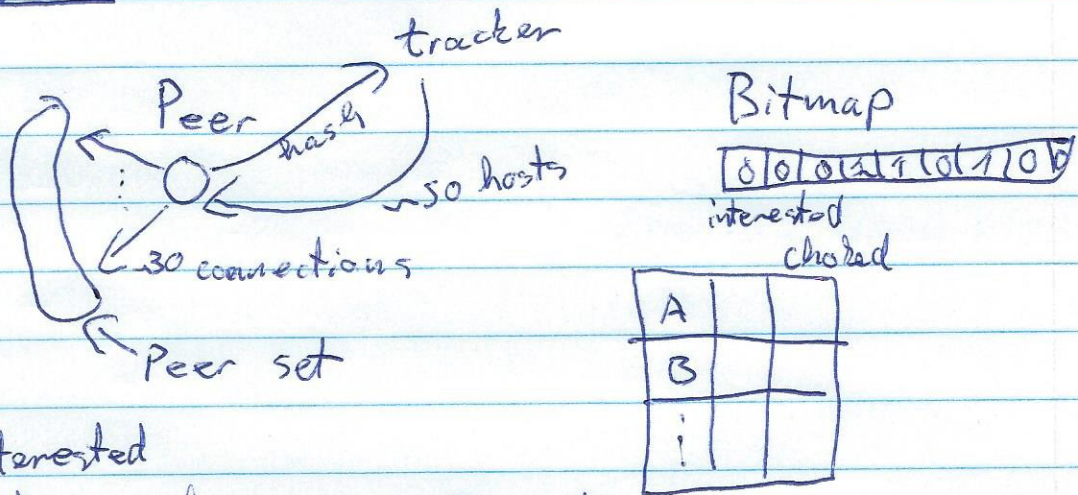


6 BitTorrent

BitTorrent



Protocol



Interested

- it peer has piece I want

Interested

- Unchoke peers who contribute to you. Changes every 10 sec
- Optimistic unchoke
 - Unchoke random peers
 - 30 sec
 - Optimize peers to have unchoked

Piece selection

- Rarest first
- Starts with random piece
- Not to overwhelm peer with rare piece
- k -rarest pieces, download random

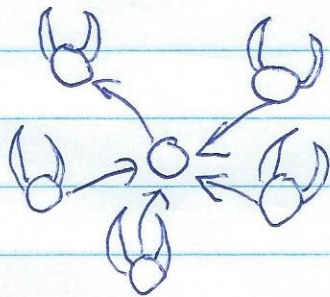
Attacks

Piece lying

- Sybil attack
- Tell we have rare piece, it becomes common
- Choke peers who want's piece.

Eclipsing

- Decrease swarm performance



- Peer only in contact with evil peers

BitTyrant

- optimize download rate for given upload capacity

Peer p :

$$\text{Rank}_p = d_p / U_p$$

Order peers by rank. Unchoke until upload capacity used.

Update d_p and U_p as follows:

- p chokes us: $U_p = (1+a)U_p$ $a=0.2$

- p unchokes us: $d_p = \text{sample download rate}$

- p unchoked us for k rounds: $U_p = (1-b)U_p$