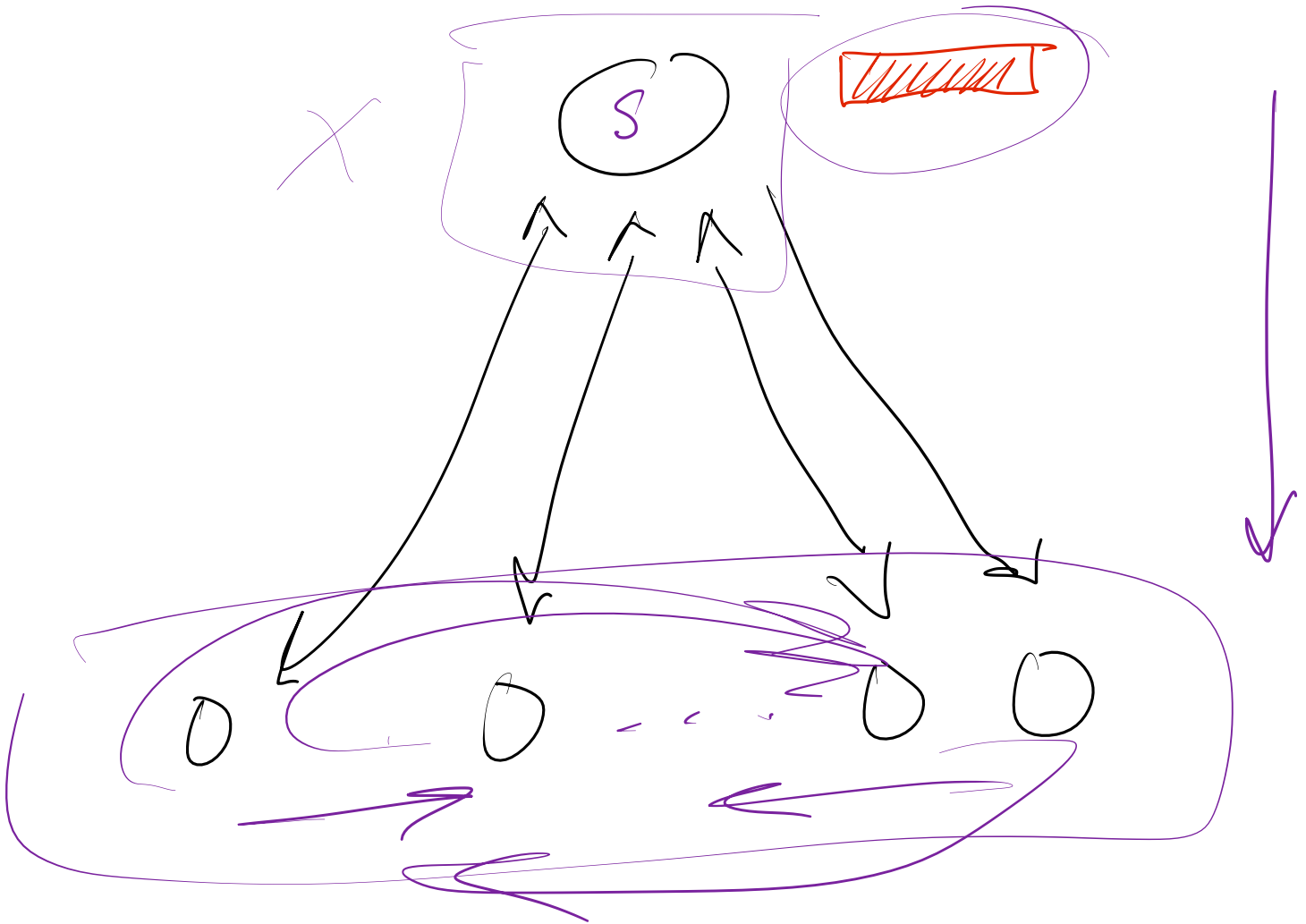


417

- BitTorrent

- vertical vs horiz. BW

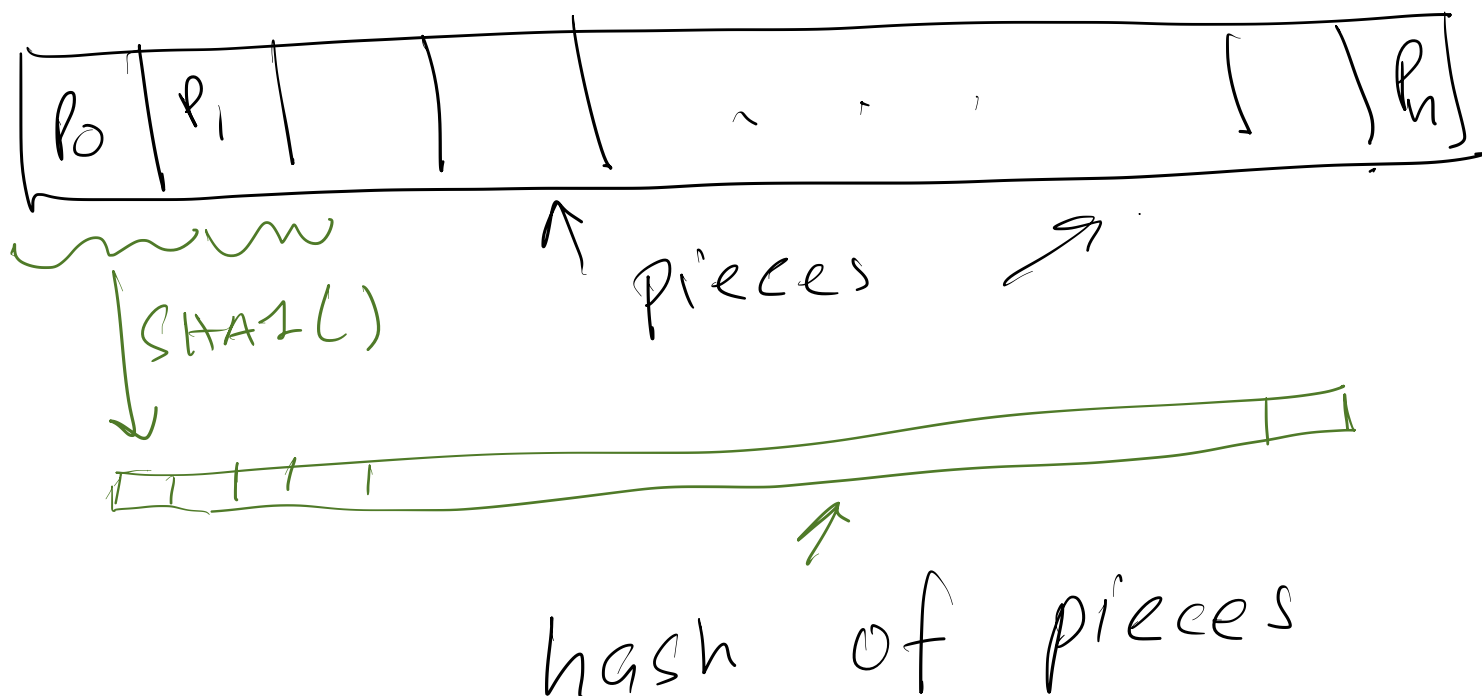


BitTorrent

→
Swarm

- Tracker
- Seeder
- Leecher

Source File



Metafile (Torrent File)

info (filenames)

announce (tracker info)

optional: author, encoding, ...

piece length (all but last.
perhaps)

pieces

SHA-1	(p0)	} # pieces
SHA-1	(p1)	
⋮		

cksum

peer → tracker

info-hash (of torrent file)

peer-id

port

uploaded

downloaded

left

event → { started
stopped
completed

} bytes

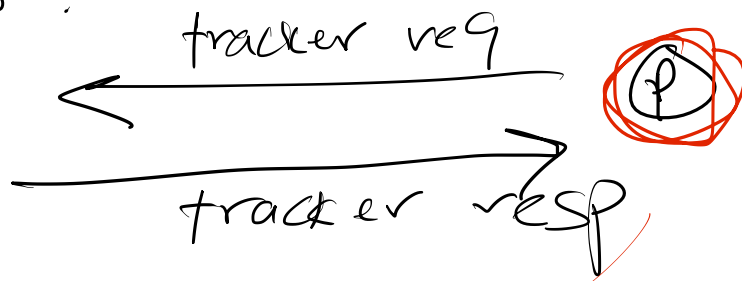
Tracker Response

interval (wait before
re-connecting)

seeders # leechers

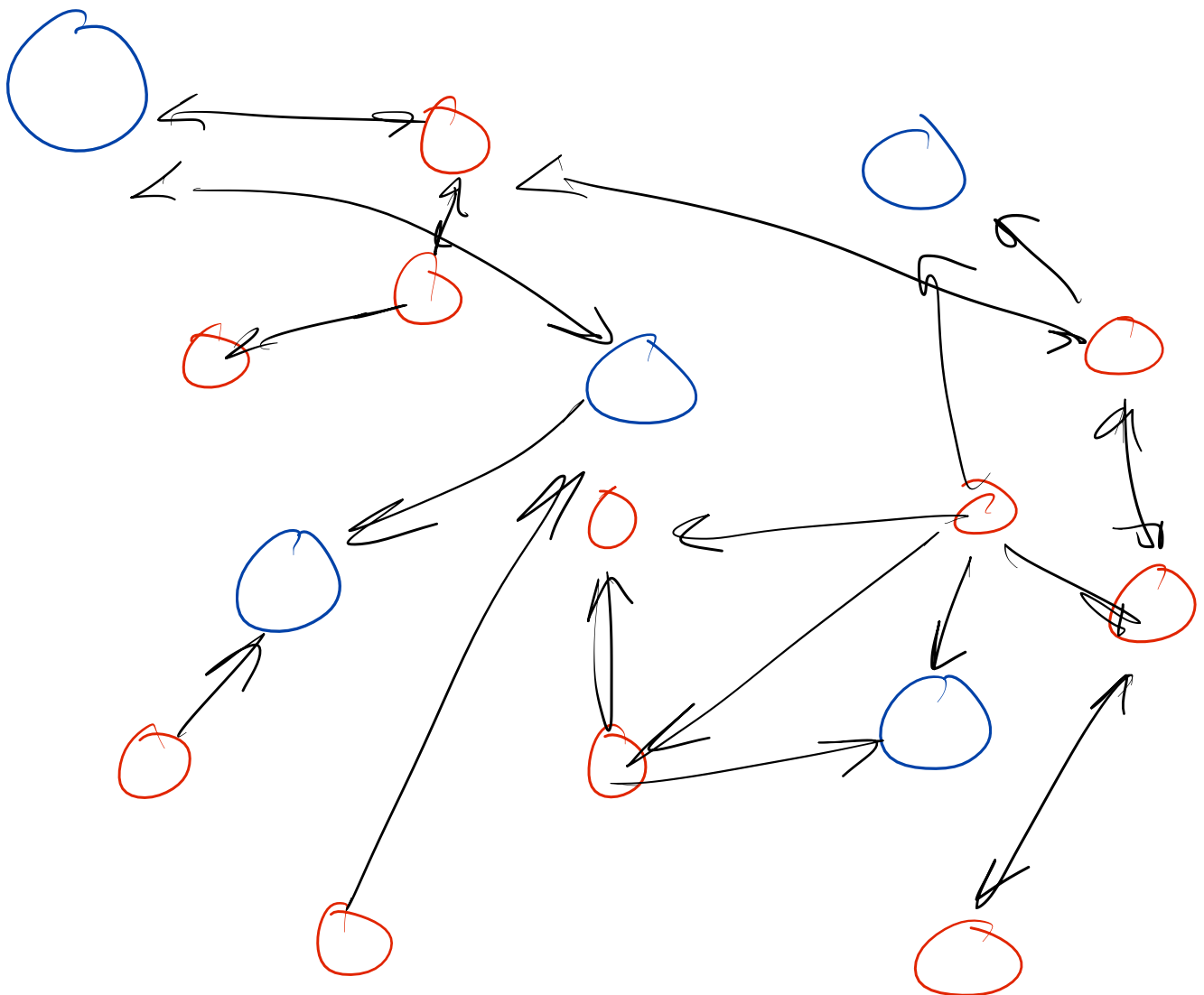
{ < peer-id, IP addr, port >, ...
 < > }
↓
nodes in the
Swarm

T : 80 ?



Seeder's

Leecher



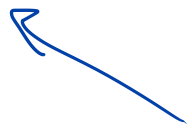
Swarm

peer protocol

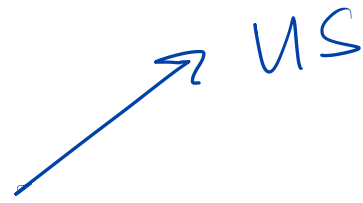
30 - 55 connections

State

remote has



choked



US



remote

we have

remote
is

is



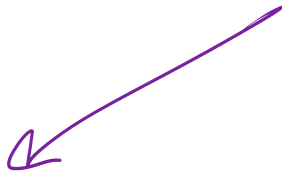
interested



in US



in
remote



we are

initially

+ peers

am-choking = 1

peer-choking = 1

am-interested = 0

peer-interested = 0

p - p messages

- keep-alive
- choke - unchoke
- interested - not interested

Handshake → < bit map >

have request piece

cancel

n



$$k \leftarrow (k - n) \% N$$

