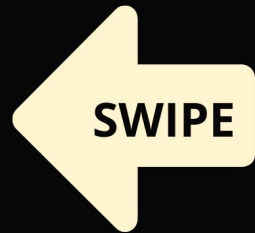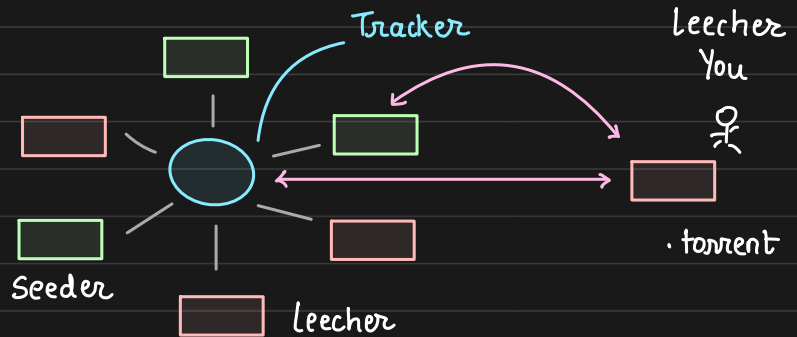# The BitTorrent Architecture

SWIPE

BY

ARPIT BHAYANI

The BitTorrent Architecture

BitTorrent architecture consist of following entires

1. .torrent file
2. Tracker
3. Seeders
4. Leechers

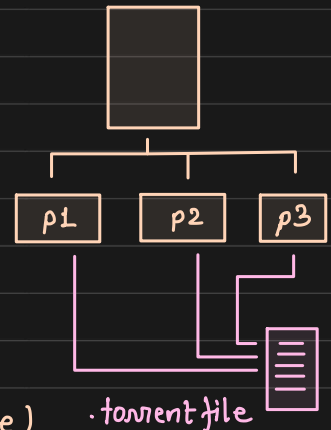Tracker

Leecher
You

Seeder

Leecher

. torrent

Pieces

The original file that is to be shared in the network is split into equal sized pieces

256KB to 1MB

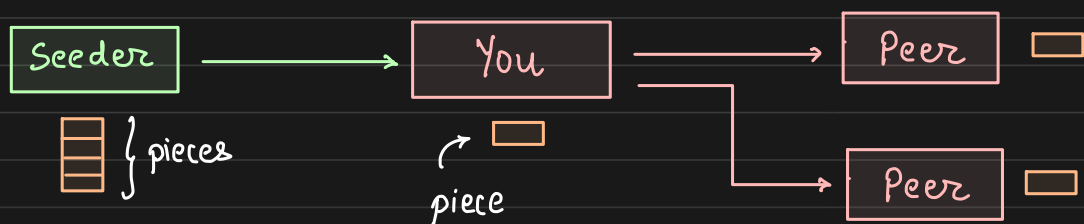The SHA1 hash of each piece is added in the .torrent file under 'pieces' attribute

Piece is fetched by its SHA-1 (from .torrent file)

Downloaded piece is checked corruption using its very SHA·1 Hash

p1   p2   p3

.torrent file

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Once a piece is downloaded by a peer, it informs other peers in the swarm so that they can download from each other.

Torrent File [detailed structure in the prev video]
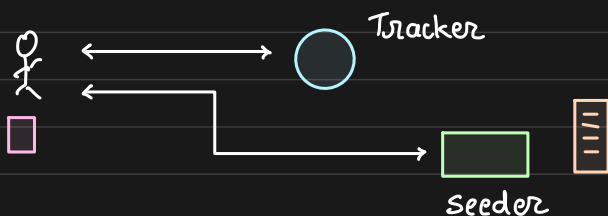
Metafile that holds information about the file. The info is static like: filename, size, pieces information etc. and not the actual data

It holds one critical information called ANNOUNCE which is a tracker URL and this tracker would tell where to download the content from.

Each torrent file is uniquely identified by a unique infohash.

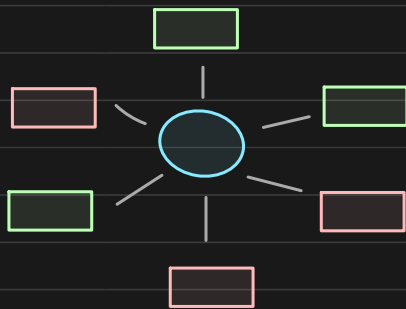.torrent is typically download through regular HTTP webservers

Tracker

Tracker is *the only* central entity *for a torrent.*
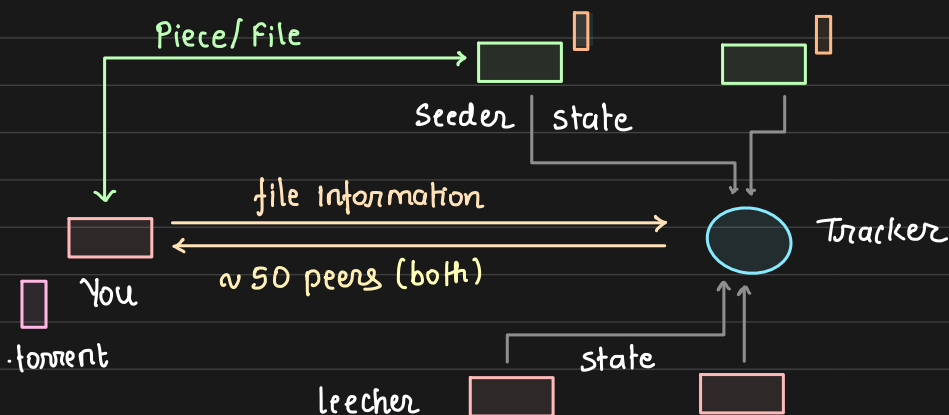
The core job a tracker is to

1. keep track of peers who hold the file
2. keep track of peers who are downloading
3. helps peer to find other peers to download content from

Note: Tracker does not download / transfer the file
      it just holds the info about peers and distribution
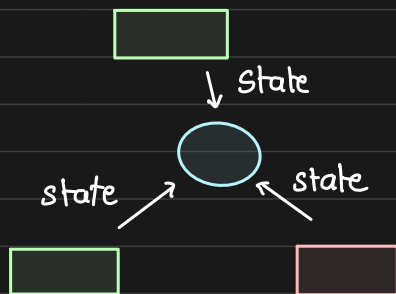
Tracker is just a simple HTTP server that

1. Hands out peer information to the network

2 periodically collects stats from the peers

Piece/File

Seeder | state

file Information

∼ 50 peers (both)

You

·torrent

leecher

state

Tracker

Once a machine receives a list of ~50 peers,
it adds it to its peer set. Every peer reports
its state to tracker every 30 minutes
↳ the amount of bytes it
has uploaded / downloaded since
it joined the torrent.

If the number of peers in the peerset drops below 20
↳ the peer will reach out to tracker to get the new list

Maximum peerset = 80

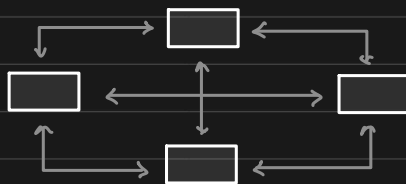Maximum connections = 80
↳ For download, max 40
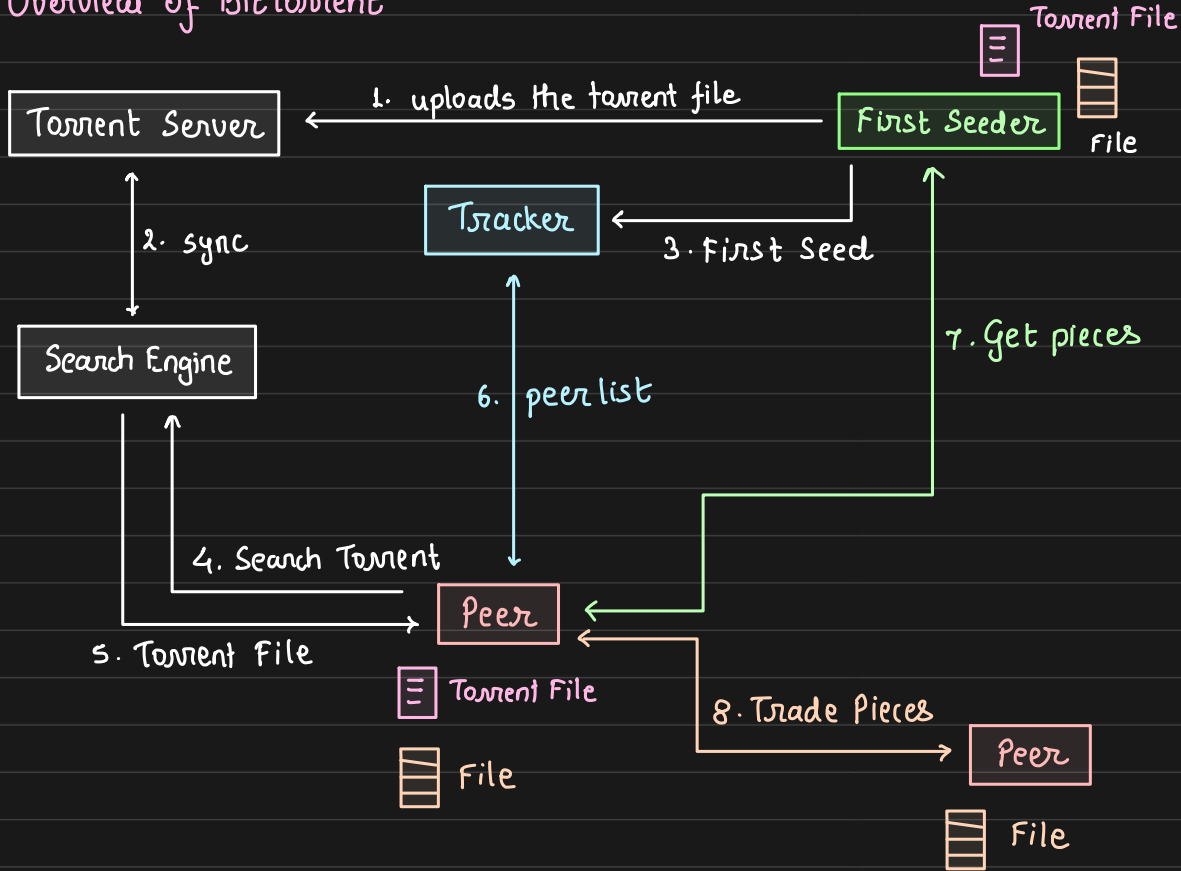↳ For upload, other 40

* the numbers and limits are
tunable.

Each peer knows, which pieces
each peer in its peerset has
through gossip.

This guarantees a good
interconnection b/w peersets
and avoid cliques

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Overview of BitTorrent

Torrent File

Torrent Server ← 1. uploads the torrent file ← **First Seeder**

File

↕ 2. sync

Tracker ← 3. First Seed

Search Engine

7. Get pieces

6. | peer list

4. Search Torrent

5. Torrent File

Peer ←

Torrent File

8. Trade Pieces → **Peer**

File

File

Seeder and leecher

Seeder is a peer that has the entire file.

leecher is a peer that is downloading the file

A leecher can download file from seeder or peer leechers

Once a leecher has the entire file, it becomes a seeder