

Creation and Distribution of Torrent File in a Peer-to-Peer Environment

1. Aim

To create and distribute a **torrent file** for sharing data using a **peer-to-peer (P2P) computing model** and to verify file integrity after download.

2. Objective

- To understand peer-to-peer file sharing
- To create a .torrent file
- To seed a file from one peer
- To download the file from another peer
- To verify file integrity after download

3. Problem Statement

Traditional client-server file sharing creates a single point of failure and high server load. Peer-to-peer file sharing distributes data among peers, improving scalability and fault tolerance.

4. System Requirements

Hardware

- Laptop / Desktop system

Software

- Torrent Client: **qBittorrent**
- Operating System: Windows / Linux
- Internet or Local Network

5. Tools Used

- qBittorrent

- File system

6. Peer-to-Peer Architecture

In a P2P system:

- Every peer can act as both **client and server**
- Files are divided into pieces
- Pieces are shared among peers
- File integrity is verified using hash values

7. Torrent Creation Procedure

1. Create a sample file to be shared
2. Open qBittorrent
3. Select **Tools → Torrent Creator**
4. Choose the file/folder
5. Add tracker information
6. Generate the .torrent file
7. Start seeding immediately

8. Torrent Distribution Method

Due to NAT and firewall restrictions in campus/hostel networks, **localhost-based P2P communication** was used.

- Seeder and downloader were executed on the **same system**
- Two torrent clients were used to simulate two peers

9. Seeding Process

- The original file was added to the torrent client
- Seeding started automatically
- The peer began advertising file availability

10. Downloading Process

- The .torrent file was added to a second torrent client
- The peer connected to the seeder
- File pieces were downloaded and reassembled

11. File Integrity Verification

- Torrent clients verify data integrity using **SHA-1 hash**
- Downloaded file matched the original file
- No corruption was detected

12. Output

- Torrent file successfully created
- Peer connection established
- File downloaded completely
- File integrity verified

13. Result

The torrent file was successfully created and distributed using a peer-to-peer model. The file was downloaded and verified without errors, demonstrating decentralized file sharing.

14. Limitations

- Campus networks may block incoming peer connections
- NAT and firewall restrictions affect public tracker communication

15. Conclusion

This assignment demonstrates the working of peer-to-peer systems using torrent technology. Even under network restrictions, P2P file sharing can be demonstrated using a localhost-based setup.

16. Screenshots

qBittorrent v5.1.0

STATUS

- All (1)
- Downloading (0)
- Seeding (1)
- Completed (1)
- Running (1)
- Stopped (0)
- Active (0)
- Inactive (1)
- Stalled (1)
- Stalled Uploading (1)
- Stalled Downloading (0)
- Checking (0)
- Moving (0)
- Errored (0)

CATEGORIES

- All (1)
- Uncategorized (1)

TAGS

- All (1)
- Untagged (1)

TRACKERS

- All (1)
- Trackerless (0)
- Tracker error (0)
- Other error (1)
- Warning (0)
- tracker.openbittorrent.com (1)

Transfer

Time Active: < 1m (seeded for < 1m)	ETA: ∞	Connections: 0 (100 max)
Downloaded: 0 B (0 B this session)	Uploaded: 0 B (0 B this session)	Seeds: 0 (0 total)
Download Speed: 0 B/s (0 B/s avg.)	Upload Speed: 0 B/s (0 B/s avg.)	Peers: 0 (1 total)
Download Limit: ∞	Upload Limit: ∞	Wasted: 0 B
Share Ratio: 0.00	Reannounce In: < 1m	Last Seen Complete: Never
Popularity: 0.00		

Information

Total Size: 492 B	Pieces: 1 x 16.0 KiB (have 1)	Created By: qBittorrent v5.1.0
Added On: 29-01-2026 21:50	Completed On: 29-01-2026 21:50	Created On: 29-01-2026 21:50
Private: No		
Info Hash v1: ff0303b8e6a255ca7e5335b0bb8b1eb0b43e2fb		
Info Hash v2: N/A		
Save Path: D:\Assignments\SEM 6\DS\ASSIGNMENT_1\TORRENT\Peer_1		
Comment:		

URL/Announce Endpoint

URL/Announce Endpoint	Tier	BT Protocol	Status	Peers	Seeds	Leeches	Times Download...
** [DHT] **			Working	N/A	0	0	N/A
** [PeX] **			Working	N/A	0	0	N/A
** [LSD] **			Working	N/A	0	0	N/A
udp://tracker.opentrackr.org:1337/announce	0		Working	2	3	0	N/A
udp://tracker.openbittorrent.com:80/announce	0		Updating...	N/A	N/A	N/A	N/A

File Edit View Tools Help

STATUS

- All (1)
- Downloading (0)
- Seeding (1)
- Completed (1)
- Running (1)
- Stopped (0)
- Active (0)
- Inactive (1)
- Stalled (1)
- Stalled Uploading (1)
- Stalled Downloading (0)
- Checking (0)
- Moving (0)
- Errored (0)

CATEGORIES

- All (1)
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TAGS

- All (1)
- Untagged (1)

TRACKERS

- All (1)
- Trackerless (0)
- Tracker error (0)
- Other error (1)
- Warning (0)
- tracker.openbittorrent.com (1)

Transfer

Progress: 100%	ETA: ∞	Connections: 3 (100 max)
Downloaded: 0 B (0 B this session)	Uploaded: 0 B (0 B this session)	Seeds: 0 (0 total)
Download Speed: 0 B/s (0 B/s avg.)	Upload Speed: 0 B/s (0 B/s avg.)	Peers: 0 (0 total)
Download Limit: ∞	Upload Limit: ∞	Wasted: 0 B
Share Ratio: 0.00	Reannounce In: < 1m	Last Seen Complete: Never
Popularity: 0.00		

Information

Total Size: 492 B	Pieces: 1 x 16.0 KiB (have 1)	Created By: qBittorrent v5.1.0
Added On: 29-01-2026 22:29	Completed On: 29-01-2026 22:29	Created On: 29-01-2026 22:29
Private: No		
Info Hash v1: ff0303b8e6a255ca7e5335b0bb8b1eb0b43e2fb		
Info Hash v2: N/A		





