

Peer to peer systems

Intro

Client/server vs. P2P

Server with clients



- Centralized
- Simple mechanism
- Server is bottleneck
- Client resources unused
- Single point of failure

P2P network

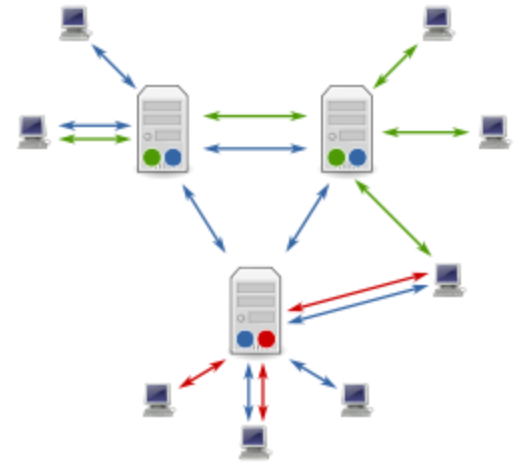


- Peers are equal
- Decentralized
- Shared resources
- Complex mechanisms
- Lack of control

Some P2P systems

Usenet

- One of the first P2P-systems
- No central authority
- Servers act as peers
- In use since 1979



Napster

- Original Napster
 - Centralized; All peers connected to a central server
 - Central server provides search
 - Peers transfer data directly between them
 - Not very scalable, single point of failure.

Kazaa (FastTrack)

- Proprietary protocol
- No central server – Fast peers can become “supernodes”
- Supernodes provide indexing for slower peers
- Program contain initial list of known supernodes
- Peers transfer data directly between them
- 2. generation P2P

Distributed hash tables (DHT)

- Pastry, Tapestry, Chord, CAN, Kademlia etc.
- Used by Bittorrent, eMule and others.
- Structured, decentralized, scalable, fault tolerant
- Keyword search difficult
- Covered in lecture

Bittorrent

- Centralized (tracker) or decentralized (DHT)
- List of peers received from tracker or DHT network.
- Data split into pieces, each identified by SHA1 hash
- Downloader may download pieces separately from different peers. Rarest piece first.

Gnutella and Freenet