

# *File Sharing in P2P Networks*

Jiří Kajaba



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# *P2P Network - definition*

- no exact definition
  - data exchange between two clients
  - computer networks - client-server, p2p
  - p2p - hybrid p2p, pure p2p
  - hybrid p2p - need servers  
(search, chat, initialization of connection, ...)
  - pure p2p - without servers
  - p2p is not file sharing  
(communication, collaboration, file sharing, ...)
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# *P2P Network - characteristics*

- client-server architecture characteristics
    - small amount of users (thousands)
    - lower reliability (one server)
    - lower implementation complexity
  - p2p architecture characteristics
    - not limited amount of users
    - higher reliability
    - higher implementation complexity
    - less effective
    - lower costs (pure p2p)
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# *P2P Network - conclusion*

- When to use p2p network?
  - too many users
  - higher reliability
  - lower costs
- alternative to p2p - cluster of client-server



# History

- P2P Network Napster
  - Shawn Fanning (nickname Napster)
  - only mp3 and chat (like IRC)
  - central servers contain lists of shared files
  - released in the fall of 1999
  - 13.6 million users in February 2001  
(source comScore Media Metrix)
  - in July 2001 closed
  - in May 2002 acquired by Bertelsmann AG
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# *Current Systems*

- hybrid p2p
  - BitTorrent
  - Direct Connect
  - eDonkey2000
  - Soulseek
- pure p2p
  - Kademia
  - Manolito
  - Overnet



# *BitTorrent*

- best for sharing temporally popular huge data (e.g. new linux distributions)
  - world number one
  - torrent - small (kB) binary download descriptor
  - tracker - server, distribution control
  - seed - client with complete file
  - uploading by downloading (more clients more performance)
  - segment downloading - hash
  - no search, chat, ...
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# *Direct Connect*

- best for sharing locale data (e.g. movie with titles)
- czech number one
- hub - server for search, chat, ...
- segment downloading (client SW, not protocol)
- uploading only completed data



# *Kademlia*

- pure p2p (without servers)
- my number one
- security and anonymity
- XOR metric algorithm



# Goals

- hybrid versus pure
- best topology
- hash
- searching
- anonymity - I2P (Invisible 2 Peer)
- legalization - rent the art?
- simulation - data from DC



# Realization

- study application view - done
  - study protocol view - already started
  - study articles - no book available :-(
  - create client for DC
    - already started
    - simulation data
    - add support for my own p2p network
  - study Kademlia
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# Copyright in Czech Republic

- „Bez výslovného souhlasu autora nelze dílo sdělovat veřejnosti a rozmnožovat.“
  - copy for personal usage (except SW)
  - download is legal (except SW), upload is illegal (including parts of art)
  - e.g. BitTorrent, eDonkey - upload by downloading
  - licence - can deny to make a copy of SW
  - solution - rent the art?
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# *Summary*

- P2P Network
- History
- Current Systems
- Goals
- Realization
- Law in Czech Republic



# Sources

- BrainyEncyclopedia  
(<http://www.brainyencyclopedia.com>)
- P2P eXPerience  
(<http://www.schnio.iglu.cz/index.php?lng=cs>)
- Martin Boček (<http://www.doupe.cz>)



*Thank you for your attention!*

Any Questions?

