Project Based Seminar (Oral) Presentation

On

Peer to Peer Communication

By

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Guide

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Contents

- Project Group
- Introduction
- Literature Survey
- Peer-to-Peer Communication
- Applications/advantages
- Conclusions
- References

Project Details

- Project Title : Document Sharing Based on Decentralized File System
- Project Domain: Blockchain Implementation
- Project Group Members:
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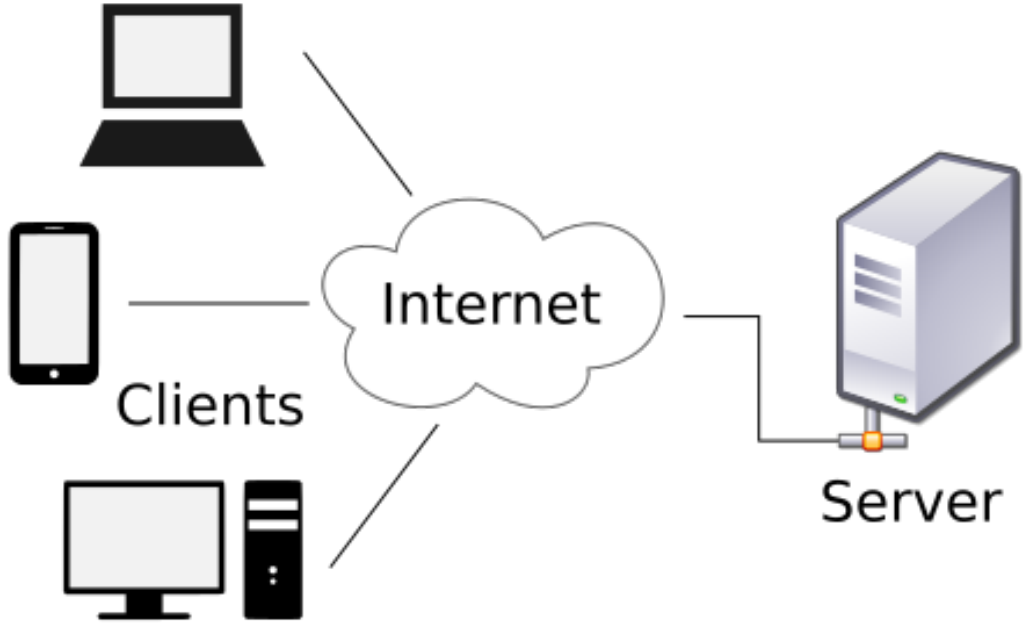
Peer to Peer Technology

History

- Before *Peer to Peer (P2P)* network was implemented, a more simple architecture was used in the form of *Client Server* architecture.
- Eg: A web server serves web pages and a file server serves computer files



Disadvantages

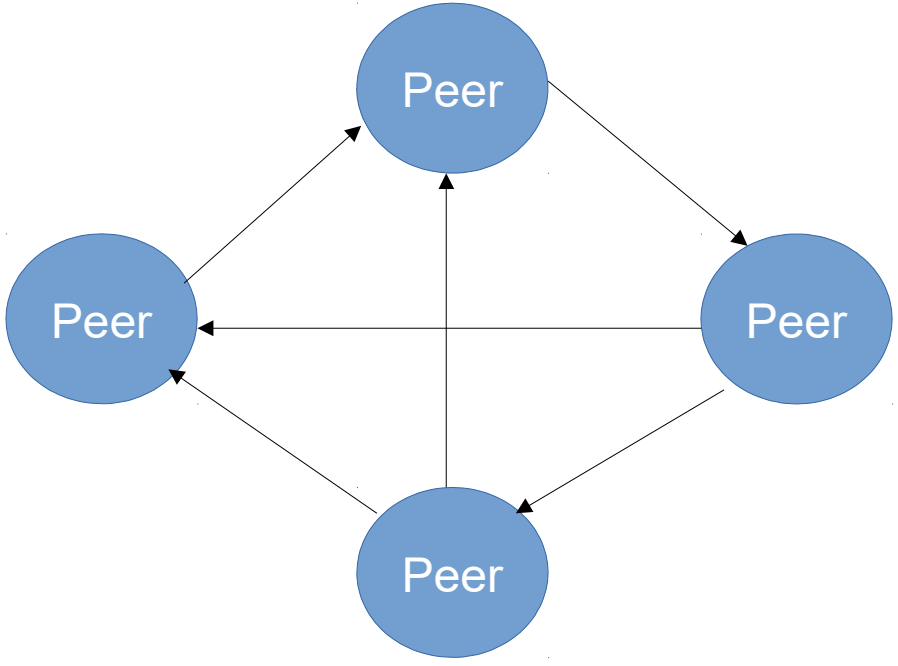
- Number of clients are much higher than number of servers.
- Unable to serve large number of clients due to traffic congestion.
- High work load on server.
- High latency.

Solution

- Peer to Peer (P2P) Networking.

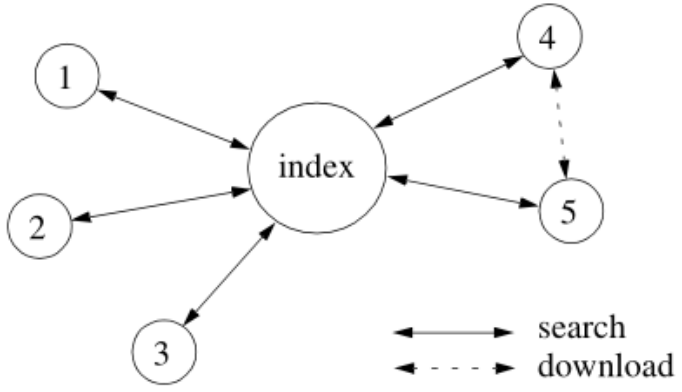
What is P2P?

- **Peer to Peer is communication between *peers* without the intervention of a server.**



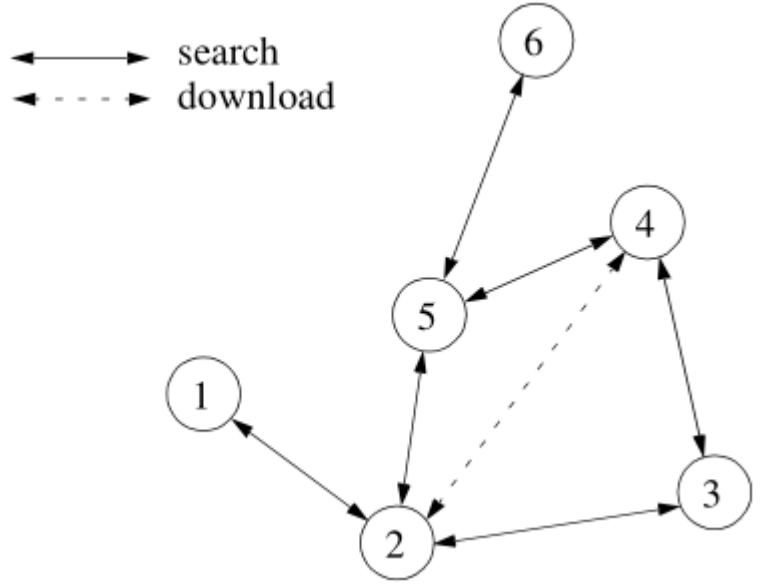
Algorithms

- Centralized directory model:
    - This model was made popular by Napster. The peers of the community connect to a central directory where they publish information about the content they offer for sharing.



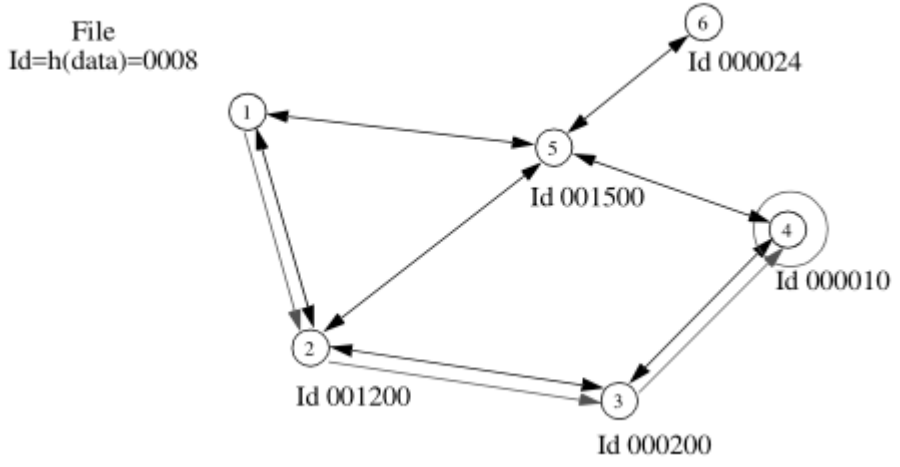
Algorithms

- Flooded Request Model:
    - This is a pure P2P model in which each request from a peer is flooded (broadcast) to directly connected peers until the request is answered or a maximum number of flooding steps (typically 5 to 9)



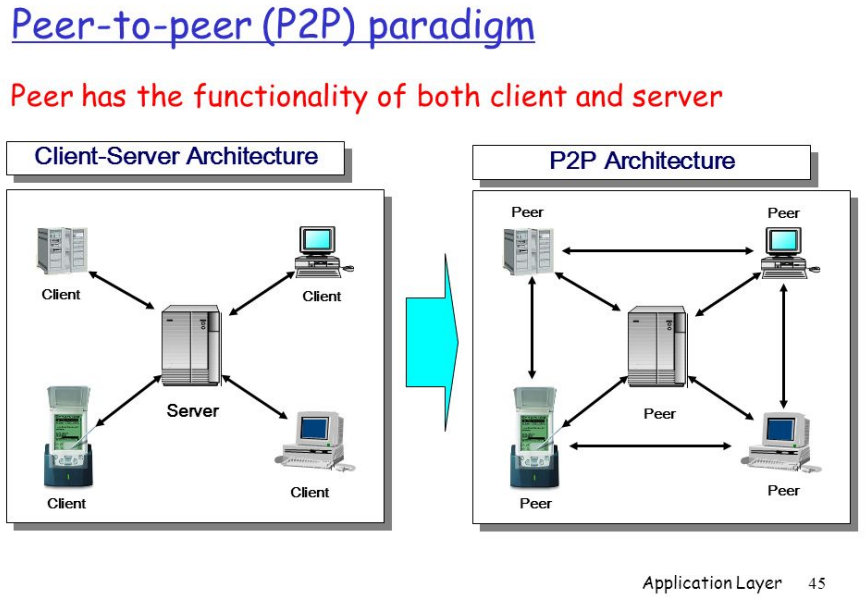
Algorithms

- **Document Routing Model:**
  - **The document routing model, is the most recent approach. Each peer from the network is assigned a random ID and each peer also knows a given number of peers.**



Advantages

- Each peer acts as a client as well as a server. Due to this, there is minimum load.



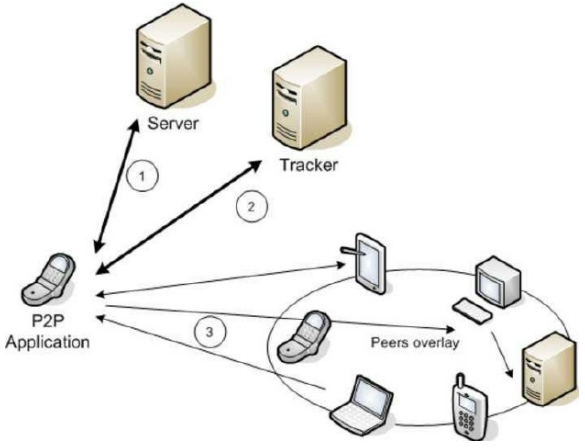
- Server is not present in P2P, which results in increased speed, reliability, reduced latency and maximum efficiency.

Applications

- Cryptocurrency:
    - Cryptocurrencies like Bitcoin, Ethereum, Litecoin, etc are based on blockchain which is a well known application of *P2P* technology.

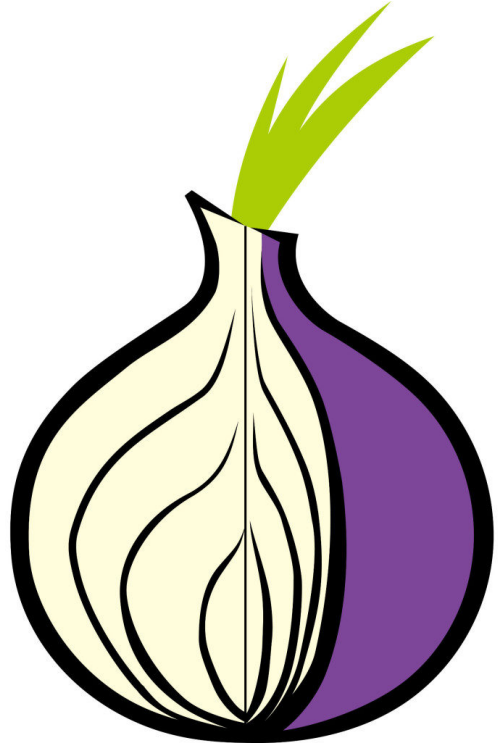
Applications

- Communication:
  - The P2P model covers a wide spectrum of communication paradigms.



- Group Management:
  - Peer group management includes discovery of other peers in the community and location and routing between those peers.

Applications



Our Implementation

- We will be using this decentralized network to share official documents amongst *peers* allowing them to access the files instantly without worrying about server crash or low bandwidth problems.

Conclusion

- In this seminar, we studied the different advantages of P2P Networking and its different application which will help in better communication amongst users.
- Due to robustness and security of P2P Networking, it can be used to develop secure transaction systems.

References

[1] Decentralised, Dynamic Network Path Selection in High Performance Computing: John Anderson, Matt Piazza, Aspen Olmsted, 2016

[2] “Peer-to-Peer Streaming Peer Protocol (PPSPP),”: A. Bakker, R. Petrocco, and V. Grishchenko, RFC 7574, Jul. 2015.

[3] Peer to Peer Computing: Dejan S. Milojicic, Vana Kalogeraki, Rajan Lukose, Kiran Nagaraja, Jim Pruyne, Bruno Richard, Sami Rollins, Zhichen Xu, 2002

Thank You!