P2P Content Delivery Network

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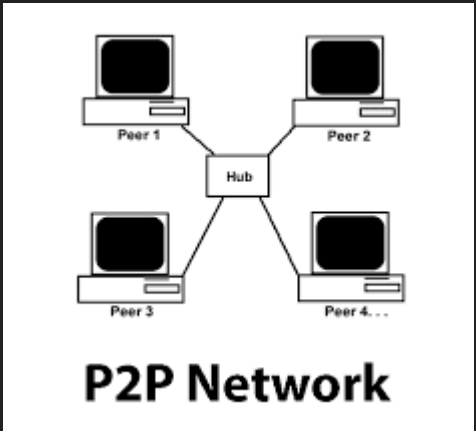
PROBLEM STATEMENT

Major streaming platforms like Hotstar, Netflix, Youtube, Amazon Prime etc use third-party content delivery networks (CDN) in order to fulfil their user demand. CDN involves setting up of various servers at different locations to maintain the network flow at high speed and reduce buffer. The major drawback of doing this is high Infrastructure costs of setting up a server and maintaining them at different locations. We aim to resolve this issue through our project.

FACTS & FIGURES

- The content delivery network (CDN) market was valued at USD 11.76 billion in 2020 and is expected to reach a value of USD 49.61 billion by 2026, at a CAGR of 27.30%, over the forecast period.
- Netflix is known to use a CDN service called akamai, Netflix revealed it would spend over $1 billion on “streaming services and cloud computing costs” through 2023.

APPROACH



We aim to resolve the issue through peer to peer networking.

In this method, user will be downloading and uploading files through the P2P network. Instead of downloading files from a central server, it involves downloading files from other users' devices on the network. Conversely, users upload files from their own devices for other users to download. It is very similar to the concept of torrent.

CONCEPT OF TORRENT

Torrenting is the most popular form of peer-to-peer (P2P) file-sharing, and it requires torrent management software to connect to the BitTorrent network. Such software can be downloaded for free for a number of different devices.

Everyone downloading or uploading the same file is called a peer, and collectively they are known as a swarm. Because of how BitTorrent works, a peer can download a file from several other users at once, or upload a file to multiple other users simultaneously.

BENEFITS & SCALABILITY

- Significantly reduced page load time of your website
- Retaining more customers
- Maximum availability of your product
- No geographical barriers
- Easy management of traffic peaks
- More scalability to your business, you can grow it as much as you want to

IMPLEMENTATION

TECH STACK:

Python3

LIBRARIES USED:

Socket, Threading

METHOD:

After entering the network, a peer can either register the file that it wants to share or download the file from other peers. The data being distributed are split into chunks. For each file, the server keeps track of the list of chunks each peer has. Any peer can download files from other peers directly. Moreover, any peer is capable of downloading different chunks of a file simultaneously from different peers. The decision of distribution of chunks will be taken by the Ford-Fulkerson and Edmonds-Karp's algorithm.

CONCLUSION

The project once integrated with a server has the capability to significantly reduce single server load and reduces the need to setup multiple servers.