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Mail Server, Cloud Server, Cloud Zoro Application, using P2P File Sharing

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Abstract

People are using P2P (Peer to Peer) network for sharing and transferring digital content containing video, audio, or any other data file over the internet from different part of the globe. All General P2P file sharing protocols were designed to work optimally in the case that all the peers have an end node on the internet i.e. they are connectible. But due to the huge number of computers behind NAT1 and proxies this is rarely achievable. Due to this, the load is unevenly distributed between the connectible and non- connectible peers, and non-connectible peers usually suffer from slow download speeds, while connectible users suffer from too many uploads. In the case that all the peers are not connectible it is not possible to use P2P at all. An approach called Mailzoro was presented entirely new p2p protocol which takes care of the deficiencies in P2P protocols. Low number of IPv4 addresses, hosts behind NAT, and the asymmetric property of broadband connections make most P2P protocols inefficient. Mailzoro an email based P2P file sharing protocol which would be a huge improvement over the existing P2P networks since every node would be reachable, and it would be possible to send a file to multiple users without uploading it multiple times. And moreover if we use systems like Gmail and Yahoo then most of the mails would be transferred internally and much more efficiently, thus improving the overall efficiency of the internet. In this project we present CloudZoro which overcomes the overhead imposed on the peer's for checking the availability of the file pieces in the mail server periodically, which may degrade the performance of low end devices, via cloud messaging we reduce the communication overhead which increases the performance by 90%.

The above approaches provided the p2p file transfer but didn't solve the node reachability problem and processing overhead on the clients. The proposed approach Cloud Zoro provides an approach that solves the peer's reach ability and the processing overhead using the cloud server. The cloud's push to device messaging allows clients and the file peer's to the transfer the message as they become reachable. The Cloudzoro approach improves the performance of the application by 90% compared to other approaches.

Keywords: MAIL SERVER, CLOUD SERVER, CLOUD ZORO APPLICATION

INTRODUCTION

P2P file sharing makes up the bulk of internet traffic nowadays. But most of them are inefficient in many ways, and rely on the presence of connectable hosts (end node on the internet). Some of the shortcomings of P2P apps based on TCP/UDP are Currently there are lots of P2P based applications like eDonkey, Soul Seek, DC++, Lime Wire, eMule and Bittorrent etc. But all of them work within TCP/IP. Because of this all system suffer from the same disadvantages as enumerated:

1. Reachability Problem: If 2 nodes are behind a proxy or firewall or any other NAT device they cannot contact each other since they don't have a reachable global IP Address. Due to the shortages of IP addresses more and more service providers are shifting over to NAT1. Currently no method exists for providing reachability to users behind proxies, but attempts have been made to establish connectivity between hosts behind NAT. Studies in have shown that NAT Traversal techniques give efficiencies of about 82% in UDP and 64% in TCP. But these methods require the use of ameditating server.
2. P2P blocking: Most networks disallow or ban P2P on their networks due to heavy traffic. Due to this many users cannot use file sharing with the outside world. Most proxy servers only allow outbound access to a few service ports (like HTTP, SMTP, POP3, Telnet, SSH etc).
3. Low Upload speed of clients: In most broadband connections the download speed is usually much higher than the upload speed. Most general broadband connections in the world provide ADSL connections which are symmetric in nature.
4. Shortage of IPv4 addresses and IPv6 compatibility problem: Due to the shortage of IPv4 addresses, it's not possible to make all peers reachable and since many OS"s and programs still lack support for IPv6. P2P applications haven't made the switch to IPv6 yet. Thus in the current situation it's not possible to have all reachable clients in a P2P network.

The above stated problems motivated us to formulate a new p2p file transfer protocol which can overcome all the stated drawbacks of the available p2p file transfer protocols.

LITERATURE SURVEY

Currently No P2P protocols exist that work at the email level and suited for small devices like mobiles. The only software remotely related to email is Pando. It use email to transfer the metadata only and all the other data transfer occurs though TCP/UDP. Moreover, the user has to manually open the inbox, download the metafile and start it in the application Pando. Then it starts transferring the files from the Internet using TCP. Thus, we would not call this an email P2P file sharing application.

There are many P2P file sharing protocols exist. They are:

BitTorrent:

The most widely used P2P protocol on the internet. BitTorrent works by establishing end to end connections between the hosts, and using them to transfer files. There are two versions of the protocol, one depends on the presence of a tracker to communicate with the peers, other doesn't require the presence of trackers, and it is based on DHT (Distributed Hash Table).

Direct Connect:

The direct connect protocol is based on the concept of hubs clients and a super hub. Peers connect to the hubs. The hub servers as a connecting point for all the peers. Peers can view the files shared by other peers, and transfer them.

Gnutella:

Gnutella is a fully distributed file sharing protocol. In this protocol each Gnutella client is connected to at least one client in the network After that the Gnutella clients asks for a list of peers from the other client. Even searching is done in a distributed way; clients disseminate the search query to the nodes that are directly connected to them.

Mailzoro:

Most P2P protocols work most efficiently when all peers are reachable. Identifying a Peer by a socket (IP + Port) is not possible in case of NAT'ted peers. So in search of a solution was 'Email'. An email address can be used to uniquely identify a particular host, on the internet irrespective of the nature of his network connection. This allows users behind NAT and proxies to be at the same level as other connectible users. Moreover, most home users use a broadband connection which is asymmetric in nature. So if we use emails to send files, then we can send the same file to more than one person.

But mailzoro imposed a lot of processing overhead on small devices for checking the email for file availability, and mailzoro requires the nodes to be reachable while making the file transfer request.

IMPLEMENTATION:

The System is designed to provide low processing file transfer protocol which can be employed on small devices such as mobile phones.

The targeted application is deployed to run on smaller devices such as mobiles phones and also laptops, Desktops.

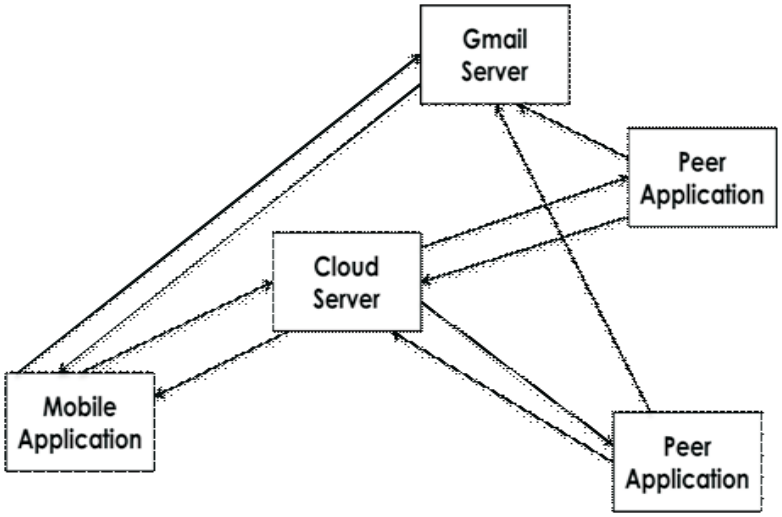
The Protocol involves 3 parties

1. The Mail Server
2. The Cloud Server
3. The CloudZoro Application

The Proposed System provides peer-to- peer file transfer using the cloud server and mail server.

The propose protocol reduces the processing overhead on small devices by 90% compared to the previous p2p file sharing applications.

The cloudzoro protocol is described below



The Cloud's push to device messaging feature allows the request to be transferred to the peer's when they become connected to the internet.

First the cloudzoro application sends the request to the Google cloud server for requesting the pieces from the file peer's and the email id of the requesting peer's. The cloud server transfer the request to the file peers instantly or stores the request in the secure cloud storage if the file peer's are not available. As soon the file peer's become available, Cloud server pushes the request to the file peer's.

File peer's processes the request and send the requested pieces to the requested peer's email id and notifies a message to the cloud server of data availability to the requested

peer. The cloud server notifies the requested peer of data availability instantly or stores on cloud storage for latter delivery of messages.

The requested peer on receiving the notification message from the cloud server connects to the Mail server and downloads the pieces and integrates the contents to generate the complete file.

Unlike previous approach, The Cloudzoro protocol solves the peer's reachability problem and provides a way for offline download via cloud push to device messaging.

The cloud server reduces the processing overhead on the clients by 90%; since the cloud server notifies the clients on data availability on the mail server reduces the processing overhead on the client to check the mail server for data availability frequently which degrades the performance the mobile devices because of low hardware constraint on small devices.

Here the CloudZoro application for mobiles is implemented using android and Cloud Zoro application for PC's are implemented using Java.

The Protocols make use of Gmail Server and Uses Google Cloud Server for demonstrating the working of the application.

CONCLUSION

The use of cloud servers reduces the processing overhead on small devices like mobile by 90%.The clouds push to device messaging reduces allows the exchange data and notification alerts if both of them are online. The secure email file transfer makes the contents to persist in mail for longer time.

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