Maintaining Consistency & Caching Scheme Efficiently in Hybrid Peer to Peer System

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Abstract—Typical peer to peer system is formed by either Structured P2P system or Unstructured P2P system. Where in structured network all peers are arranged in fixed topology & in unstructured network peers are arranged using mixed topology. Here, we call it as hybrid P2P system design. By combining this for our distributed data sharing which gives us advantages of both Structured P2P system & Unstructured P2P system, and reduces their disadvantages .Here, Adaptive Consistency Maintenance Algorithm we are using for polling the file owner to update the file periodically & Consistency maintenance is used for propagating the updates from primary file to its replica. For improving system performance, we are using Top-Caching algorithm which gives a cache for most popular data files. By implementing this algorithm we are trying to reduce over-caching problems also try to balance the load.

Index Terms—. Peer to peer system, Structured & Unstructured peer to peer system, Hybrid system.

I. INTRODUCTION

From the recent innovative working on networks, different network architectures are arises & P2P network is one of them which break the centralized system & prefer distributed system in which peers are designed to working equally & share their resources. Here peer can join & leave the network frequently so, P2P network are called as dynamic network. Due to decentralization P2P network are where useful for distributed application. The main use of this system come for distributed computing where non-used resources are used for computing purpose.

P2P network are divided into Structured & Unstructured network. Where in structured network all peers are arranged in fixed topology & in unstructured network peers are arranged using mixed topology. Here, unstructured P2P networks provide flexibility & structured P2P network provide efficiency.

Here, we are looking for maintaining consistency using Adaptive File Consistency Algorithm. Also try to reduce over caching problems for the most popular data objects & increasing system performance using Top Caching.

II. EXISTING SYSTEM

A. Existing System

Before implementing the hybrid P2P system, two different systems are exists: 1.P2P system & Hybrid P2P system where we are combining these both systems for taking advantages of these systems:

1. P2P network:

As shown in figure P2P network consist of nodes, we call it as peers. These peers have same priority & these are designed mainly for distributed data sharing & also for resource sharing.
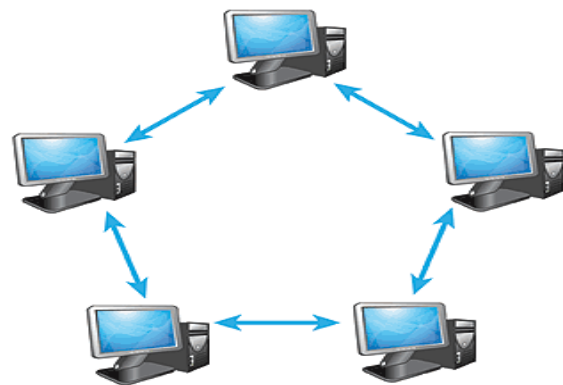

Fig.1.0 P2P network

2. Hybrid network:

As its name implies it's a hybrid network which is made from more than one single architecture. It provides flexibility. Following is the example of A Star Bus network Submit your manuscript electronically for review.
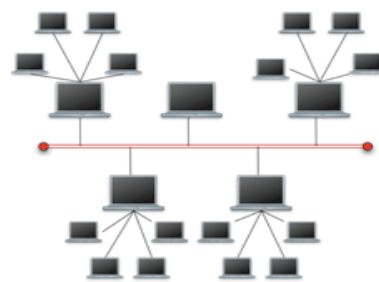

Fig.2.0 Hybrid network

Hybrid networks use a combination of any two or more topologies in such a way that the resulting network does not make one of the standard topologies. Examples for Hybrid network are: star-ring network and star bus network.

III. PROPOSED SYSTEM

By trying to reduce disadvantages of older system we are proposing a new hybrid system in which we are using both Structured P2P network & Unstructured P2P network, where backbone of our network is Structured P2P network. And Unstructured P2P network provide dynamic join & leave facility to nodes.

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Main aim of our Hybrid P2P system is to provide platform for distributed data sharing & Information Retrieval System. It gives us advantages of both Structured P2P system & Unstructured P2P system by reducing disadvantages. It achieves balance between efficiency & flexibility. Here we are using file consistency algorithm for maintaining consistency, so file owner periodically update the file & no of replica by reducing consistency overhead.

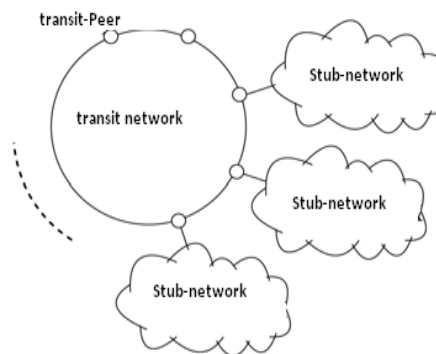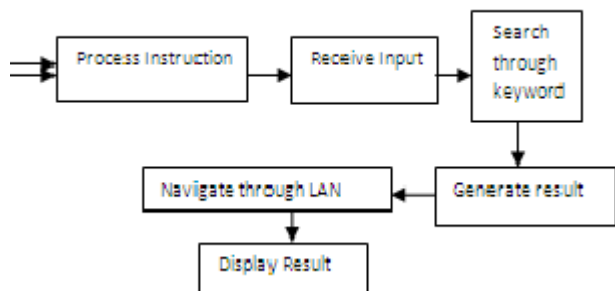By using Top-Caching algorithm we are building a cache memory for our P2P system.

Fig.3.0

In Block diagram, the input/instruction is taken. Where this instruction may of Join/Leave request or may be request of document. Firstly, Instruction is categorized, if instruction is of Join/Leave:

1. A hash code is generated & acts as unique Id for that node.
2. A unique ID is assigned to new node & then new node act as part of main network.

Now, if instruction is of document:

1. We take input from that node along with its address.
2. After receiving input, we search for that particular document in a network.
3. All related searches are collected together
4. Finally, all data is sent to particular node

IV. FUNCTIONS

A. Core Network:

Here we are using structured network as a core transit network which act as backbone of the system. Where all peers are formed in ring structure. Here every peer is called as transit peer or t-peer. Each peer is assigned with an unique id number.

B. Stub Network:

In Stub network or s-network we are using gnutella style unstructured P2P network where, each stub is attached to transit peer & this transit peer belongs to both the t- network & s-network. Here, in s-network we are using tree topology for maintaining hierarchy.

C. Hybrid P2P system:

Behind hybrid P2P system basic idea is that t-network is used to provide flexibility & dynamic join & leave facility to peers. This system effectively reduces the maintenance overhead of system.

Fig.4.0 Construction of Hybrid P2P system

D. Adaptive File consistency Algorithm:

This polling frequency algorithm helps us to update the frequently modified files than least modified files .Here; Refresh Time (RT) is given to each replica where, TR denotes the time required to poll the most frequently modified file. Here,

$$RT=RT_{old} + add \text{ ------------ } (1)$$

Where "add" should be greater than 0 sec.And this value should be increased linearly & reduced by multiplicative factor.

$$RT= RT_{old}/mul \text{ ------------ } (2)$$

Where "mul"is the multiplicative factor & it should be greater than 1 sec.

Here, we are also taking two other time instances, maximum & minimum, which denotes the upper & lower bound of the Refresh Time & we have to select & assign maximum Refresh Time as RT.

E. Top caching Algorithm:

1. While m M and rpeer has not obtained data:
rpeer uses substrate to determine peer
The mth place
Winner for data
2. rpeer requests data from peer
• Node peer update (peer).
• If node peer already has data, node peer Sends data to rpeer;
Stop.
• If node peer does not have data but it should, peer

Gets data, stores data and delete files if necessary. Node peer
Send data to rpeer
3. m = m+ 1
//rpeer:receiever peer (peer who want data)
//peer: general peer

V. CONCLUSION

Finally in this paper we conclude that we are proposing a hybrid peer to peer system that gives benefit of storing, retrieving & fast accessing of data files through any type of network. Where, we are also maintaining consistency of file replicas & also try to boost the system performance by using the cache memory.

It also manages the load of hosting peers & gives us better service. By improving & adding the new changes in algorithm we can also make the system more & more efficient.

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