International Journal of Engineering Research and Modern Education (IJERME)
ISSN (Online): 2455 - 4200
(www.rdmodernresearch.com) Volume I, Issue I, 2016

EFFICIENT P2P FILE SHARING SYSTEM USING AES ALGORITHM

M. Lalitha* & K. Adlin Suji**
* PG Scholar, Department of Master of Computer Applications, Dhanalakshmi Srinivasan Engineering College, Perambalur, Tamilnadu
** Associate Professor, Department of Master of Computer Applications, Dhanalakshmi Srinivasan Engineering College, Perambalur, Tamilnadu

Abstract:

Hosting and distribution of these everywhere contents are accomplished using content distribution networks (CDNs). CDNs distribute contents in multiple hosting locations for load balancing, availability, and easy access. However, scalability and cost of CDNs are becoming major challenges due to the increase of content-based services. To combat these problems, peer-to-peer (P2P) systems are being considered in combination with CDN to complement each other in a hybrid system. Peer-to-peer (P2P) applications have shown their popularity in the Internet for file sharing. In contrast to the traditional server-client model of content distribution, more scalable to accommodate a large number of users and amount of content, more fault tolerance for content being shared by multiple sources, and less time required to download a given data file. We introduce a Proximity-Aware and Interest-clustered P2P file sharing System (PAIS) based on a structured P2P, which forms physically-close nodes into a cluster and further group's physically-close and common-interest nodes into a sub cluster based on a hierarchical topology. It creates replicas of files that are frequently requested by a group of physically close nodes in their location. First, it further classifies the interest of a sub-cluster to a number of sub-interests, and clusters common-sub-interest nodes into a group for file sharing. Second, PAIS builds an overlay for each group that connects lower capacity nodes to higher capacity nodes for distributed file querying while avoiding node overload .Third, to reduce file searching delay. Further, the experimental results show the high effectiveness of the intra-sub-cluster file searching approaches in improving file searching efficiency.

1. Introduction:

This paper presents an efficient P2P file sharing System on a structured P2P system. It forms physically-close nodes into a cluster and further group's physically-close and common-interest nodes into a sub-cluster. It also places files with the same interests together and make them accessible through the DHT Lookup routing function. More importantly, it keeps all *advantages* of DHTs over unstructured P2Ps. Relying on DHT lookup policy rather than broadcasting, the PAIS construction consumes much less cost in mapping nodes to clusters and mapping clusters to interest sub-clusters. PAIS uses an intelligent file replication algorithm to further enhance file lookup efficiency. Using AES algorithm for encrypt and decrypt the request and response for secured file sharing system.

It creates replicas of files that are frequently requested by a group of physically close nodes in their location. Moreover, PAIS enhances the intra sub-cluster file searching through several approaches

- ✓ First, it further classifies the interest of a sub-cluster to a number of sub-interests, and clusters common-sub-interest nodes into a group for file sharing.
- ✓ Second, PAIS builds an overlay for each group that connects lower capacity nodes to higher capacity nodes for distributed file querying while avoiding node overload.

- ✓ Third, to reduce file searching delay, PAIS uses proactive file information collection so that a file requester can know if its requested file is in its nearby nodes.
- ✓ Fourth, to reduce the overhead of the file information collection, PAIS uses bloom filter based file information collection and corresponding distributed file searching.
- ✓ Fifth, to improve the file sharing efficiency, PAIS ranks the bloom filter results in order.
- ✓ Sixth, considering that a recently visited file tends to be visited again, the bloom filter based approach is enhanced by only checking the newly added bloom filter information to reduce file searching delay.

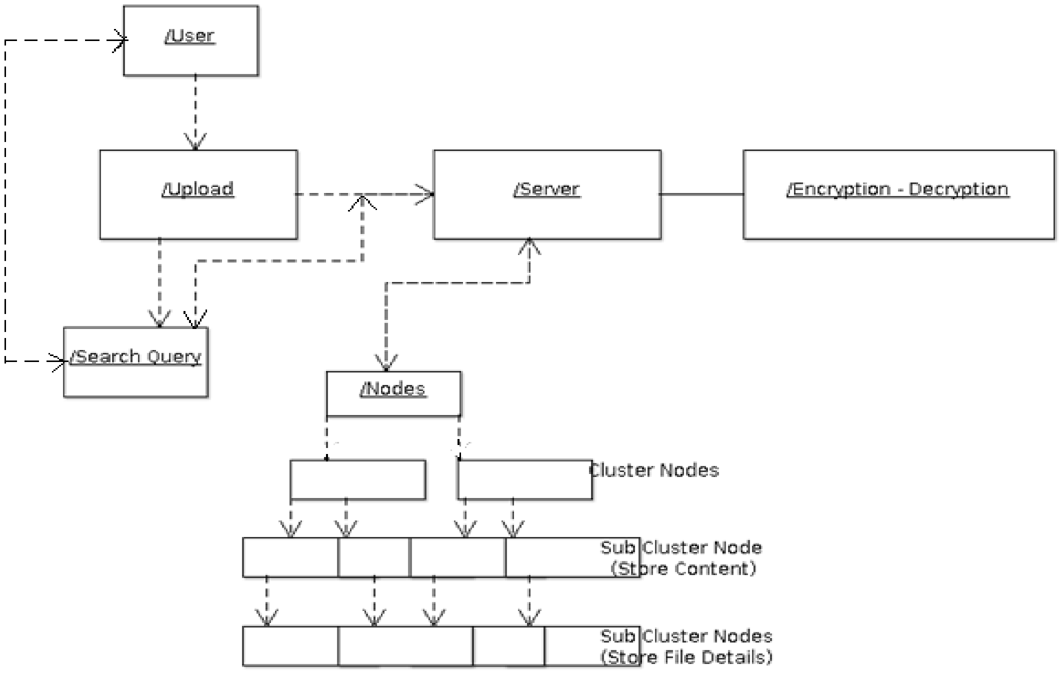


Figure 1: System Architecture

2. Related Works:

Techniques to exploit topology information in P2P overlay routing include geographic layout, proximity routing, and proximity-neighbor selection. Geographic layout method maps the overlay's logical ID space to the physical network so that neighboring nodes in the ID space are also close in the physical network. It is employed in topologically-aware. In the proximity routing method, the logical overlay is constructed without considering the underlying physical topology. In a routing, the node with the closest physical distance to the object key is chosen among the next hop candidates in the routing table. The entries of a routing table are selected based on a proximity metric among all the nodes that satisfy the constraint of the logical overlay.

Proposed a method for clustering peers that share similar properties together and a new intelligent query routing strategy. Crespo and Garcia-Molina proposed a semantic overlay network (SON) based on the semantic relations among peers. Ruffo and Schifanella studied the spontaneous communities of users in P2P file sharing applications and found that a family of structures show self-organized interest-based clusters. The works in consider node interest for publish and subscribe. Iamnitchi et al found the small world pattern in the interest-sharing community graphs, and suggested clustering common-interest nodes to improve file searching efficiency. Some works leverage the social network common interest property for efficient file searching. It clusters users with the same interests together for efficient peer assisted video delivering. Li and Shen proposed a P2P file sharing system based on social networks, in which common-multi-interest nodes are grouped into a cluster and are connected based on social relationship.

3. Proposed System:

Investigating in the file-sharing preference of users and correlation between different resources categories in a real peer-to-peer network. Analytic methods from complex networks theory to investigate the File sharing. Relation between the users and the resources could be described by a bipartite sharing graph, with one subset for the users and the other for the resources. Using weighted user network, users built connections based on their sharing interests to similar resources, and different resources are correlated together due to many users' sharing behaviors, with weighted edges indicating their interaction strengths. PAIS uses an intelligent file replication algorithm to further enhance file query efficiency. And AES algorithm used to strength and secures file sharing process.

Advantages:

- ✓ The over-all cost of building and maintaining this type of network is comparatively very less.
- ✓ Its more reliable.
- ✓ Failure of one peer does not affect the functioning of other peers.
- ✓ There is no need for full-time System Administrator. Because every user is the administrator of his/her machine.
- ✓ User can control their shared resources.

Modules:

- ✓ PAIS Structure
- ✓ Node proximity representation
- ✓ Node interest representation
- ✓ Clustering physically close and common-interest nodes
- ✓ File Distribution

PAIS Structure: PAIS is developed based on the Cycloid structured P2P network. A node's interests are described by a set of attributes with a globally known string description such as "image" and "music". The strategies that allow the description of the content in a peer with metadata can be used to derive the interests of each peer. Taking advantage of the hierarchical structure of Cycloid, PAIS gathers physically close nodes in one cluster and further groups' nodes in each cluster into sub-clusters based on their interests.

Node Proximity Representation: A land marking method can be used to represent node closeness on the network by indices used. Landmark clustering has been widely adopted to generate proximity information. It is based on the intuition that nodes close to each other are likely to have similar distances to a few selected landmark nodes. We assume there are m landmark nodes that are randomly scattered in the Internet. Each node measures its physical distances to the m landmarks and uses the vector of distances as its coordinate in Cartesian space. Two physically close nodes will have similar vectors. We use space-filling curves, such as the Hilbert curve, to map the m-dimensional landmark vectors to real numbers, so the closeness relationship among the nodes is preserved. We call this number the Hilbert number of the node denoted by H. The closeness of two nodes' Hs indicates their physical closeness on the Internet.

Node Interest Representation: Consistent hash functions such as SHA-1 is widely used in DHT networks for node or file ID due to its collision-resistant nature. When using such a hash function, it is computationally infeasible to find two different messages that produce the same message digest. The consistent hash function is effective to cluster messages based on message difference.

Clustering Physically Close and Common-Interest Nodes: Based on the Cycloid topology and ID determination, PAIS intelligently uses cubical indices to distinguish nodes in different physical locations and uses cyclic indices to further classify physically close nodes based on their interests. Specifically, PAIS uses node is Hilbert number, Hi, as its cubical index, and the consistent hash value of node is interest as its cyclic index to generate node is ID denoted. If a node has a number of interests, it generates a set of IDs with different cyclic indices. Using this ID determination method, the physically close nodes with the same H will be in a cluster, and nodes with similar H will be in close clusters in PAIS. Physically close nodes with the same interest have the same ID, and they further constitute a sub-cluster in a cluster.

File Distribution: As physically close and common-interest nodes form a sub-cluster, they can share files between each other so that a node can retrieve its requested file in its interest from a physically close node. For this purpose, the sub-cluster server maintains the index of all files in its sub-cluster for file sharing among nodes in its sub-cluster. A node's requested file may not exist in its sub-cluster. To help nodes find files not existing in their sub-clusters, as in traditional DHT networks, PAIS re-distributes all files among nodes in the network for efficient global search.

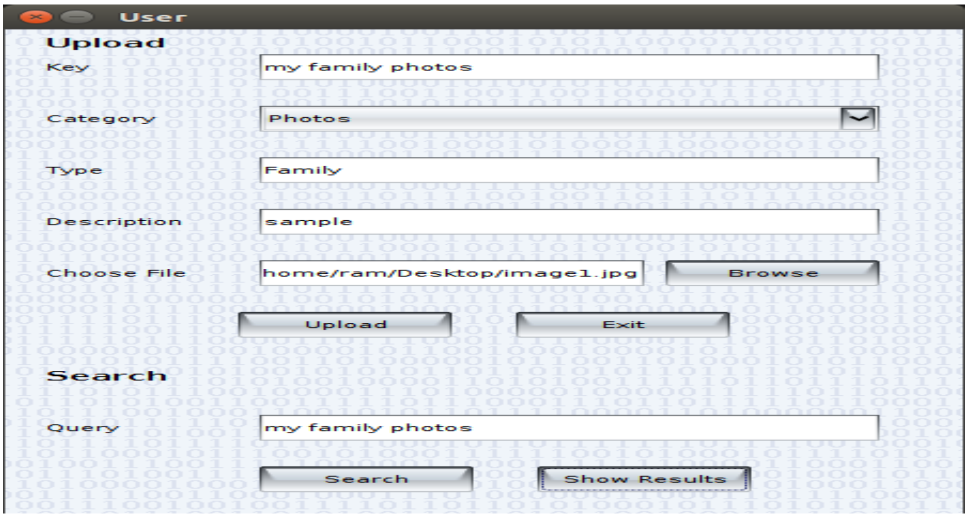
4. Experimental Analysis and Results:

We motivate special database problems introduced by peer-to-peer computing and propose the Local Relational Model (LRM) to solve some of them. As well, we summarize a formalization of LRM, present architecture for a prototype implementation, and discuss open research questions. We expect the P2P data management system to use coordination formulas for recursively decomposing the query into sub queries that are evaluated with respect to the databases of acquaintances. Coordination formulas may also act as soft constraints or guide the propagation of updates. In addition, peers need an acquaintance initialization protocol where two peers exchange views of their respective databases and agree on levels of coordination between them. The level of coordination should be dynamic, in the sense that acquaintances may start with little coordination, strengthen it over time with more coordination formulas, and eventually abandon it when tasks and interests change.

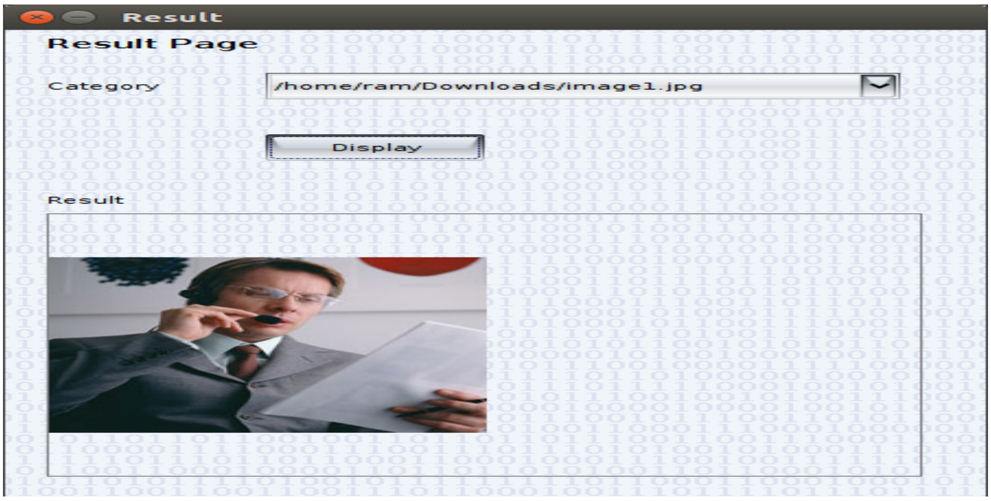
Super-peer architectures exploit the heterogeneity of nodes in a P2P network by assigning additional responsibilities to higher-capacity nodes. In the design of a super-peer network for file sharing, several issues have to be addressed: how client peers are related to super-peers, how super-peers locate files, how the load is balanced among the super-peers, and how the system deals with node failures. In this paper we introduce self-organizing super-peer network architecture (SOSPNET) that solves these issues in a fully decentralized manner. SOSPNET maintains a super-peer network topology that reflects the semantic similarity of peers sharing content interests.

Super-peers maintain semantic caches of pointers to files which are requested by peers with similar interests. Client peers, on the other hand, dynamically select super-peers offering the best search performance. A peer-to-peer system that is particularly designed for heterogeneous environments such as in wireless networks. We use a pool of standard personal computers distributed over the Internet which act as reliable nodes and form the backbone of the network as super peers. The mobile nodes are represented by mobile phones running a lightweight implementation of our system able to use the super peers as proxies. The demo shows the effectiveness of the approach with a mobile picture sharing application benefiting from several improvements such as load balancing and optimal operation point selection algorithms.

User-Upload and Search the File:



Result:



5. Conclusion:

To enhance file location efficiency in P2P Systems, interest-clustered super-peer networks and proximity-clustered super-peer networks have been proposed. Although both strategies improve the performance of P2P systems, few works cluster peers based on both peer interest and physical proximity simultaneously. Moreover, it is harder to realize it in structured P2P systems due to their strictly defined topologies, although they have high efficiency of file location than unstructured P2Ps. We introduce a proximity-aware and interest-clustered P2P file sharing system based on a structured P2P. It groups peers based on both interest and proximity by taking advantage of a hierarchical structure of a structured P2P. PAIS uses an intelligent file replication algorithm that replicates a file frequently requested by physically close nodes near their physical location to enhance the file lookup efficiency. Finally, PAIS enhances the file searching efficiency among the proximity-close and common interest nodes through a number of approaches. Thetrace-driven experimental results on PlanetLab demonstrate the efficiency of PAIS in comparison with other P2P file sharing systems. It dramatically reduces the overhead and yields significant improvements in file location efficiency even in node dynamism.

6. Future Enhancement:

As physically close and common-interest nodes generate on another level sub clustering nodes, they can share file details information for node can retrieve its requested file in its interest from a physically close node. For this purpose, the sub-cluster node maintains the index of all file details in its sub-cluster.

7. References:

1. Philip A. Bernstein, Fausto Giunchiglia, Anastasios Kementsietsidis, John Mylopoulos, Luciano Serafini, and Ilya Zaihrayeu."Data Management for Peer-to-Peer Computing: A Vision" 2002.
2. L. Garc´es-Erice, E. W. Biersack, P.A. Felber, K.W. Ross, and G. Urvoy-Keller "Hierarchical Peer-to-peer Systems" 2003.
3. Haiying Shen, Guoxin Liu, "A Proximity-Aware Interest-Clustered P2P File. Sharing System" JUNE 2015.
4. Pawe Ãl Garbacki and Dick H.J. Epema "Optimizing Peer Relationships in a Super-Peer Network" 2007.
5. "An Efficient and Trustworthy P2p and Social Network Integrated File Sharing System" www.lemenizinfotech.com 2015