Venkata Santhosh Deepak, Mudiganti Vijaya Bhaskar / International Journal of Engineering Research and Applications (IJERA) ISSN: 2248-9622 www.ijera.com
Vol. 2, Issue 6, November- December 2012, pp.117-122

Implementation Of Coquos On Unstructured P2P Network To Achieve Continuous Queries

Venkata Santhosh Deepak[*1] ,Mudiganti Vijaya Bhaskar[*2]
[*1]M.Tech Student, Gokul Institute of Technology & Science, Bobilli , INDIA
[*2]Asst.Professor, CSE Dept, Gokul Institute of Technology & Science, Bobilli, INDIA

Abstract

Considering on-demand content discovery mechanism, currently P2P content distribution systems are constructed. By including two major capabilities like a mechanism through which peers register long term interest in network which notify new data items whenever they occur, and second capability is that advertising its content which enhances the utility of the systems. Presents proposals need intricate indexing and routing schemes to fulfil the above two capabilities which not only make them highly complex but also render the overlay network less flexible toward transient peers. For which we proposed a Scalable and effective middleware which is called as CoQUOS to support unremitting queries in unstructured overlay networks. We proposed two techniques namely, cluster-resilient random walk algorithm and dynamic probability-based query registration scheme. First scheme used for propagating the queries to various regions of the network and second scheme to ensure that the registrations are well distributed in the overlay. And we also proposed effective and efficient schemes for providing resilience to the churn of the P2P network and for ensuring a fair distribution of the notification load among the peers.

Keywords- content delivery, continuous queries, P2P networks, publish-subscribe systems, random walk.

I. INTRODUCTION

In the past few years, both structured and unstructured P2P networks have experienced significant research searching through ad-hoc queries has been the predominant information discovery mechanism in P2P networks. Several researchers have studied efficient and scalable alternatives to the flooding-based searching in unstructured P2P networks Random walk and its variants have been explored as alternatives to the broadcast strategy. However, the ad-hoc query paradigm is inadequate for advanced P2P content sharing applications.

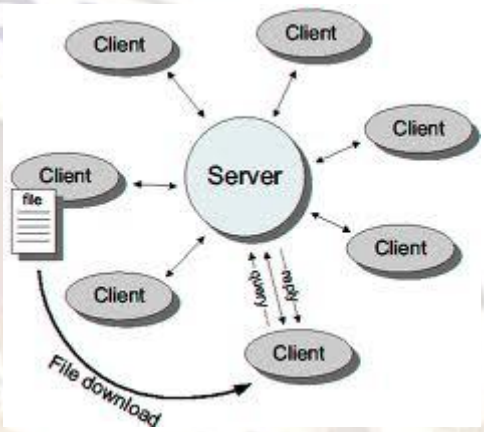

Fig.1: Decentralized P2P Architecture

A second research area that is closely related to work presented in this paper is that of pub-sub systems (event delivery systems. The early pub-sub systems adopted a centralized architecture for subscription maintenance and matching and notification of published data items, whereas the latter systems were either partially or completely decentralized. More recently, researchers have designed decentralized pub-sub systems on top of P2P networks several pub-sub systems have been successfully implemented on structured P2P platforms. Unstructured P2P networks-based pub-sub systems are relatively less explored. The main difficulty in designing pub-sub systems on unstructured P2P networks emerges from the fact that the topologies of most unstructured P2P networks have no relationship to the data (or other information) in individual peers. As a result, routing in these networks is, in general, independent of peers' contents (a few unstructured P2P networks use content-sensitive heuristics for routing). Most unstructured P2P networks-based pub-sub systems try to overcome these difficulties by carefully controlling the manner in which the topology of the overlay network evolves, and by adopting intricate indexing strategies for routing subscriptions and notifications. Unfortunately, these mechanisms are highly complex and they introduce significant overlay management overheads thereby limiting the scalability of the corresponding systems. As mentioned in the introduction, the Sub- 2-Sub requires peers to be clustered on the basis of their

subscriptions. The publisher of a data item is required to reach the cluster that exactly corresponds to the data item being published, and then start the dissemination process. The RDF-based pub-sub scheme designed in the context of ELENA project also suffers from similar limitations. This system also requires the peers of the overlay to be meticulously organized, in this case, to form an intricate bi-level Hyper cup architecture. Besides having limited scalability, the system is very vulnerable to super peer failures. The CoQUOS system differs fundamentally from P2Pbased pub-sub schemes. All of the above-mentioned systems are essentially pub-sub systems which are implemented on a P2P platform. In contrast, the goal of our work is to enhance the content discovery capabilities of unstructured P2P content distribution networks. With the goal of achieving guaranteed notification, most unstructured

P2P-based pub-sub systems include complex overlay management strategies. On the other hand, our CoQUOS system does not impose any restrictions on the topology of the overlay, employs lightweight techniques, yet it provides high success rates. However, CoQUOS might not be appropriate for applications where guaranteed notification is necessary. Smart Seer is a structured P2P overlay-based continuous query system for document repositories. Unlike Smart Seer, CoQUOS does not rely upon DHT for mapping continuous queries to peer nodes hosting them or for routing notifications. Instead, it incorporates lightweight mechanisms like CRW and dynamic probability scheme for registering continuous queries on various peer nodes of the overlay. Peer CQ is a P2Pbased continual query system for information change monitoring. It too uses the DHT to distribute change monitoring queries to the nodes of the network. Researchers have studied the properties of random walk as well as its utility for various P2P applications such as computing aggregate queries and uniform sampling of peers in unstructured P2P networks.

Several variants of random walk such as popularity biased random walk have been proposed for P2P searching. Show that the performance of random walk degrades if the overlay network exhibits considerable degree of node clustering. CRW overcomes this limitation by favoring out-of-cluster peers at each hop of message propagation.

II. SYSTEM OVERVIEW

The fundamental idea of the CoQUOS system is to register the continuous query on a set of peers that are located in various topological regions of the overlay network. These query replicas are used by the CoQUOS system to notify the respective source peers of matching advertisements issued by other peers. Considering the decentralized nature of unstructured P2P networks, an important research challenge is to develop a completely distributed mechanism to register the continuous queries at various regions of the P2P network so that the system has high notification effectiveness. Further, it is also necessary to develop low-cost techniques for providing resilience to the churn of the overlay network and for achieving fair distribution of notification load among the peers in the network. Towards addressing these challenges, this paper makes four novel contributions.

• First, we present a novel query propagation technique called Cluster Resilient Random Walk (CRW). This technique retains the overall framework of the random walk paradigm. However, at each step of propagation, CRW favors neighbors that are more likely to send messages deeper into the network thereby enabling the continuous queries to reach different topological regions of the overlay network.

• Second, a dynamic probability scheme is proposed for enabling the recipients of a continuous query to make independent decisions on whether to register the query. In this scheme, a query that has not been registered in the past several hops has a higher chance of getting registered in its next hop, which ensures that registrations are well distributed along the path of a query message.

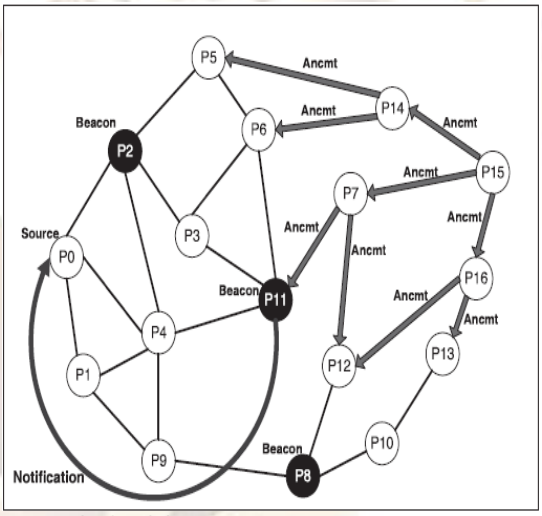

Fig.2: CoQUOS system overview

• Third, we discuss a passive replication-based scheme for preserving high notification effectiveness of the system even when the underlying P2P network experiences significant churn.

• Finally, we propose a local load re-distribution strategy to achieve fair distribution of notification loads among the participating peers.

a) Cluster-Resilient Random Walk

Flooding-based broadcast is an option for circulating continuous queries. However, this would be analogous to a breadth first traversal of the

network. As previous studies have reported, in this scheme, messages remain in close vicinity of the source node and do not go deep into the network. Random walk is another message propagation paradigm that has received considerable attention from the P2P research community. In the context of P2P networks, random walk works as follows: When a peer node Pi receives a message whose TTL has not expired, it selects one of its neighbors completely at random and forwards the message to that peer. Since, at each step the message is forwarded to only one neighbor, the message load imposed by random walk is very low. Random walk corresponds to a depth-first traversal of the network, and a message propagated through random walks has a higher probability of reaching remote regions of the network than its flooding-based counterpart. In this paper, we use the terms random walk and pure random walk (PRW) interchangeably.

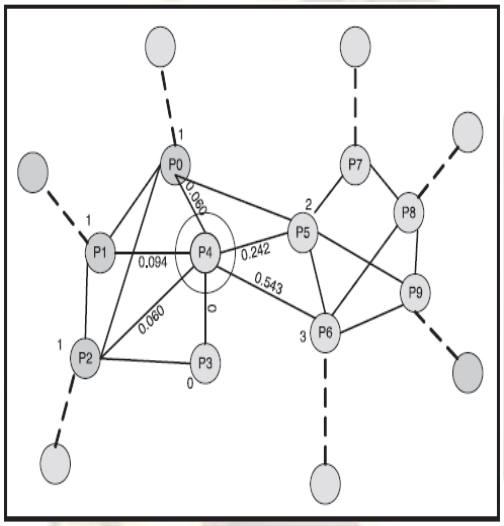

Fig.3 : Illustration of cluster resilient random walk

b) Dynamic-Probability-Based Query Registration

The CRW scheme provides a mechanism for propagating a continuous query. But, how does a node receiving this message decide whether to register the query? A straightforward solution would be to register a query at every node it visits. However, this would result in large numbers of unnecessary subscriptions, which affects the efficiency of the network. Alternatively, each peer receiving a query message can decide register it with a certain fixed probability, say Rp. We call this scheme the fixed probability-based query registration scheme (FP scheme). Although this strategy seems intuitive, it cannot guarantee high notification success rates for every query. The reason is that for some continuous queries a long series of peers in the path of the query message may all decide not to register the query, whereas another sequence of consecutive nodes may all decide to host the query. The announcements originated near the dry patches of a query's this might fail to reach any of its beacon nodes, thus leading to low success rates.

The objectives of our experimental study of the CoQUOS system are fourfold:

1. Evaluating the effectiveness of the CRW technique in propagating continuous queries,
2. Studying the performance of the dynamic probability approach for query registrations,
3. Evaluating the churn resilience and the load balancing mechanisms, and
4. Evaluating the communication costs.

III. SYSTEM DESIGN & IMPLEMENTATION

For implementation independent specification and verification, and for subsequent synthesis of specifications into efficient implementations.

The proposal is divided into below sub-tasks:

i) adopt/further develop a model for formal, high-level system specification and verification.

ii) Demonstrate the efficacy of the developed model by applying it to a suitable part of the consortium demonstrator, the network terminal for broadband access.

iii) Develop a systematic method to refine the specification into synthesizable code and a prototype tool which supports the refinement process and links it to synthesis and compilation tools.

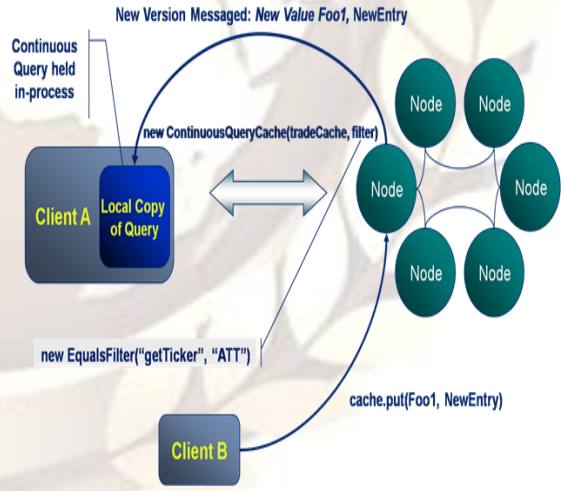

Fig.4 : System Architecture

The Modelling represents a collection of best engineering practices that have proven successful in the modelling of large and complex systems. The modelling is a very important part of developing objects oriented software and the software development process. The modelling uses mostly graphical notations to express the design of software projects. Using the modelling helps project teams communicate, explore potential designs, and validate the architectural design of the software.

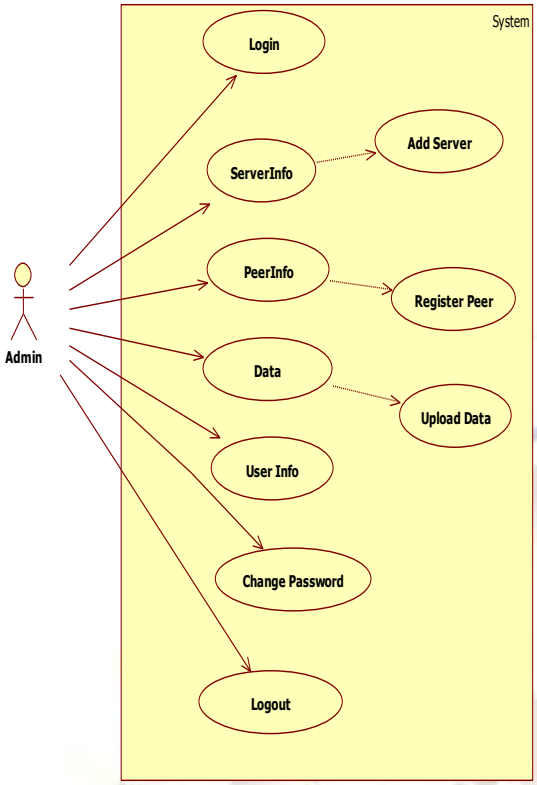

Fig.5 : Interoperational Usecase diagram for adminstrator

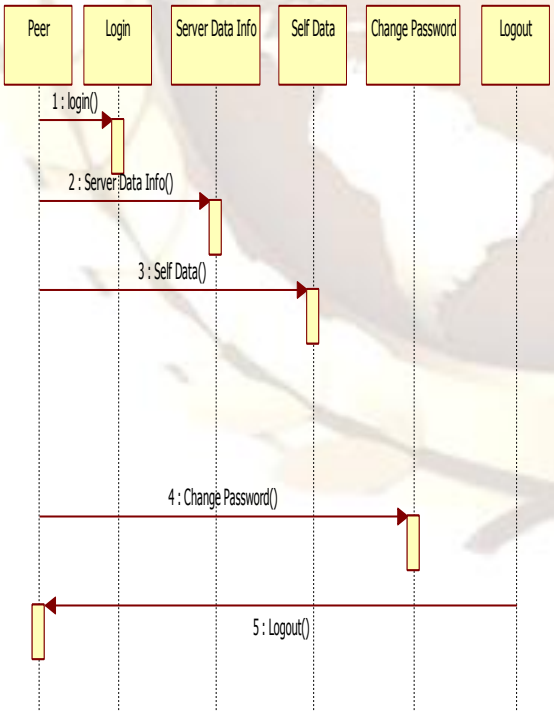

Fig.6 : Interoperational Sequence Diagram for Peers

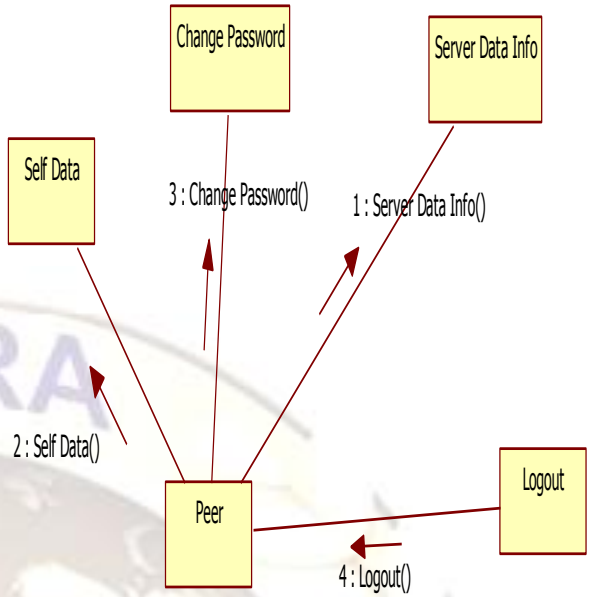

Fig.7 : Interoperational Collavoration Diagram for Peers

IV. RESULTS

Fig.8 : Viewing all Customer Details

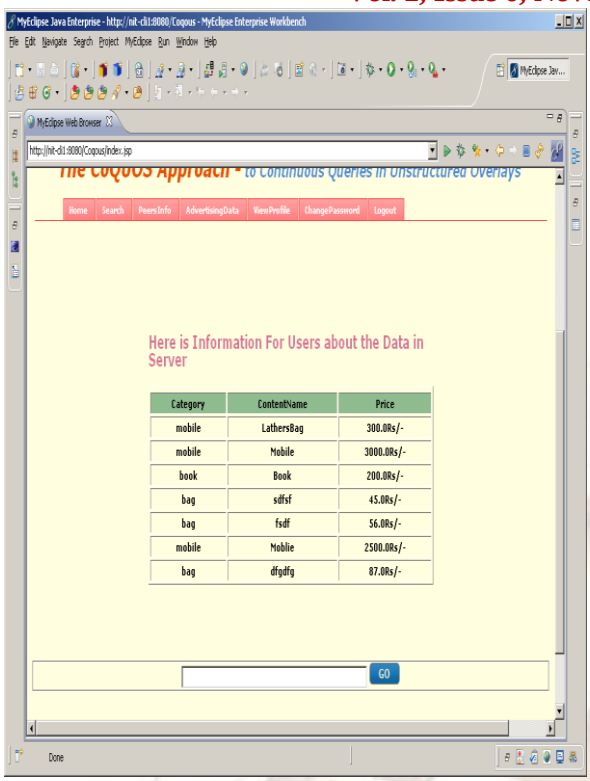

Fig.9 : Information for the User about the data in the server

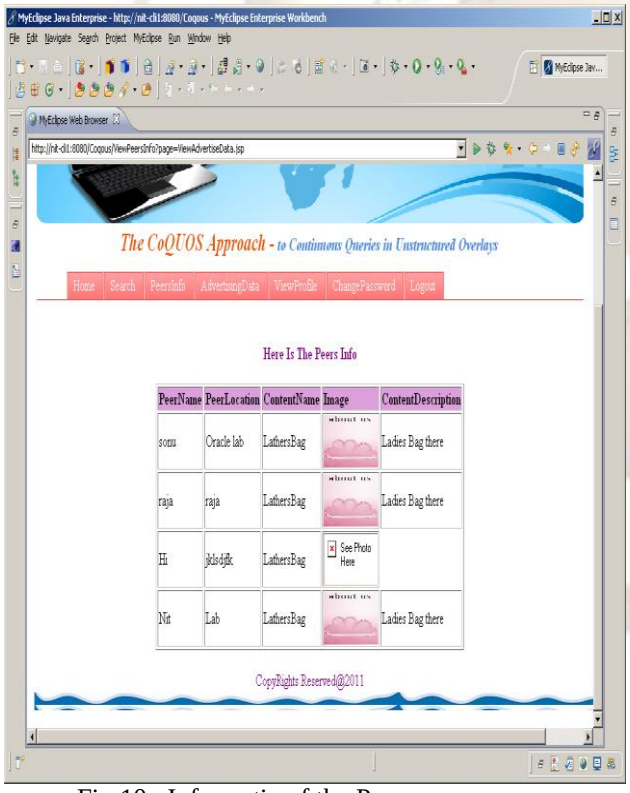

Fig.10 : Informatio of the Peers

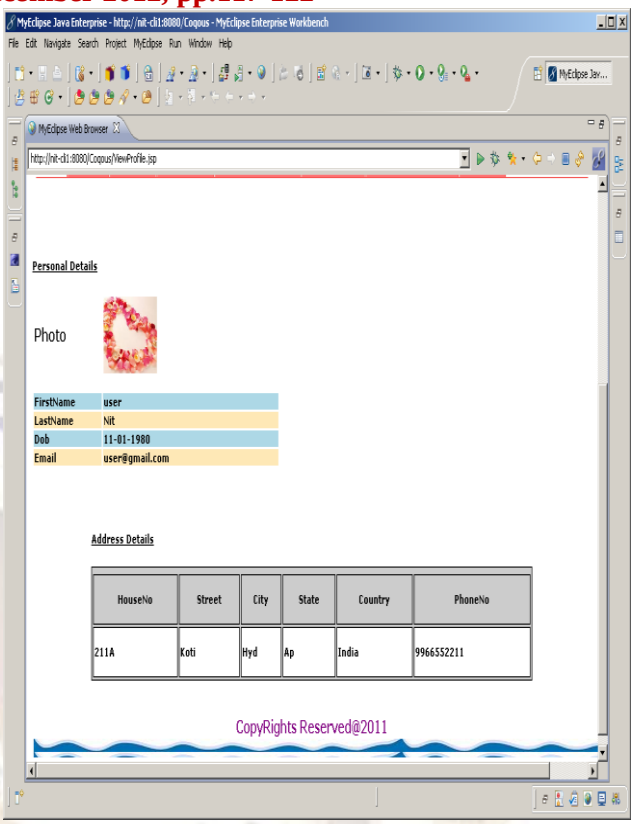

Fig.11 : Details of the User

CONCLUSION

Allowing peers of a formless P2P content sharing networks for registering longstanding queries and receiving notification when a new matching item appears can considerably increase effectiveness. We overcome the complexity of pub-sub system on unstructured overlays by our continues query paradigm study in this paper. Here we presented CoQUOS system which support continues queries in Unstructured P2P network by including different features such as lazy replication technique for countering network churn, cluster resilient random walk for query propagation and dynamic probability scheme for query registration.

References

[1] R. Baldoni, C. Marchetti, A. Virgillito, and R. Vitenberg. Contentbased Publish-Subscribe over Structured Overlay Networks. In Proceedings of ICDCS , 2005.

[2] G. Banavar, T. Chandra, B. Mukherjee, J. Nagarajarao, R. E. Strom, and D. C. Sturman. An Ef_cient Multicast Protocol for Content- Based Publish-Subscribe Systems. In Proceedings of ICDCS 1999, 1999.

[3] S. Androutsellis-Theotokis and D. Spinellis. A Survey of Peerto- Peer Content Distribution Technologies. ACM Comput. Surv., 2004.

[4] J. Chen, L. Ramaswamy, and A. Meka. Message Diffusion in Unstructured Overlay Networks. In Proceedings of NCA, 2007.
[5] T. Bu and D. F. Towsley. On Distinguishing between Internet Power Law Topology Generators. In INFOCOM, 2002.
[6] A. Carzaniga, D. S. Rosenblum, and A. L. Wolf. Design and evaluation of a wide-area event noti_cation service. ACM Transactions on Computer Systems, 19(3):332.383, 2001.
[7] P. Reynolds and A. Vahdat, "Efficient Peer-to-Peer Keyword Searching," Proc. ACM/IFIP/USENIX Int'l Middleware Conf. '03, 2003.
[8] B. Segall, D. Arnold, J. Boot, M. Henderson, and T. Phelps, "Content Based Routing with Elvin4," Proc. Australian Unix System User Group Conf., 2000.
[9] K. Sripanidkulchai, "The Popularity of Gnutella Queries and Its Implications on Scalability," O'Reilly's www.openp2p.com website. Feb. 2001.
[10] I. Stoica, R.Morris, D.Karger, M.F. Kaashoek, and H. Balakrishnan, "Chord: A Scalable Peer-to-Peer Lookup Service for Internet Applications," Proc. ACM SIGCOMM '01, Aug. 2001.
[11] D.J. Watts and S.H. Strogatz, "Collective Dynamics of 'Small- World' Networks," Nature, vol. 393, no. 6684, pp. 440-442, 1998.

Author List:

Venkata Santhosh Deepak received B.Tech in Computer science from JNTUH, Pursuing M.Tech in Computer Networks from Gokul institute of Engineering & Technology Affiliated to JNTUK.. His research area of interest is Web Technology.

Mudiganti Vijaya Bhaskar received B.Tech in Computer science from AU, M.Tech in Computer Science from AU. Pursuing Ph.d in soft computing in AU. His research area of interest is Soft Computing.