IJARCCE ISSN (O) 2278-1021, ISSN (P) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

Impact Factor 7.39 ⁜ Vol. 11, Issue 5, May 2022

DOI: 10.17148/IJARCCE.2022.11502

SUPER PEER ARCHITECTURE USING DISTRIBUTED COMPUTING

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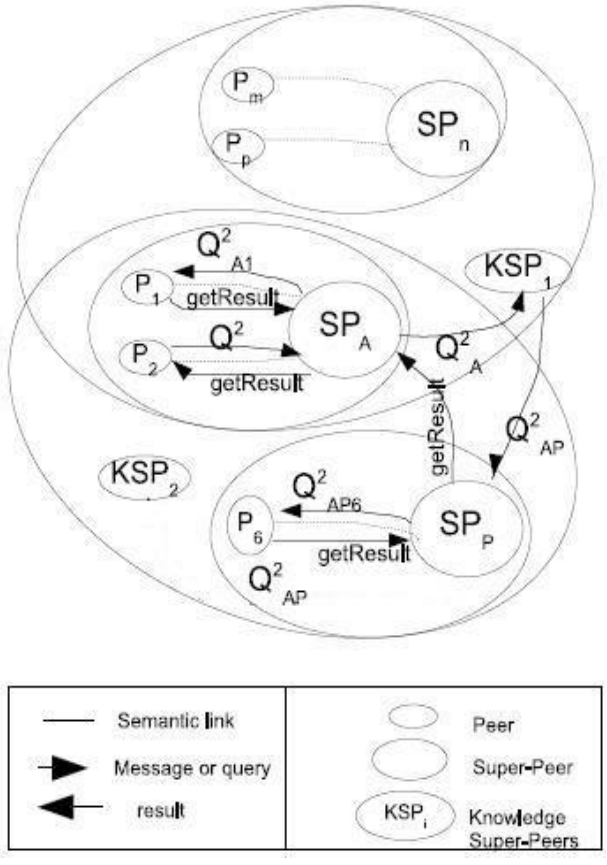
Abstract: Peer-to-peer (P2P) Data-sharing systems now generate a significant portion of internet traffic. P2P systems have emerged as a popular way to share huge volumes of data. Requirements for widely distributed information systems supporting virtual organizations have given rise to a new category of P2P systems called schema- based. In such systems each peer is a database management system in itself, ex-posing its own schema. A fundamental problem that confronts peer-to-peer applications is the efficient location of the node that stores a desired data item. In such settings, the main objective is the efficient search across peer databases by processing each incoming query without overly consuming bandwidth.

Keywords: p2p.

I INTRODUCTION

Peer-to-peer (P2P) systems have recently become a popular medium through which to share huge amounts of data. Because P2P systems distribute the main costs of sharing data – disk space for storing files and bandwidth for transferring them – across the peers in the network, they have been able to scale without the need for powerful, expensive servers.



The key to the usability of a data-sharing P2P system, and one of the most challenging design aspects, is efficient techniques for search, route queries and retrieval of data. The major problem in such networks is query routing, i.e., deciding to which other (super-)peers the query has to be sent for high efficiency and effectiveness. The

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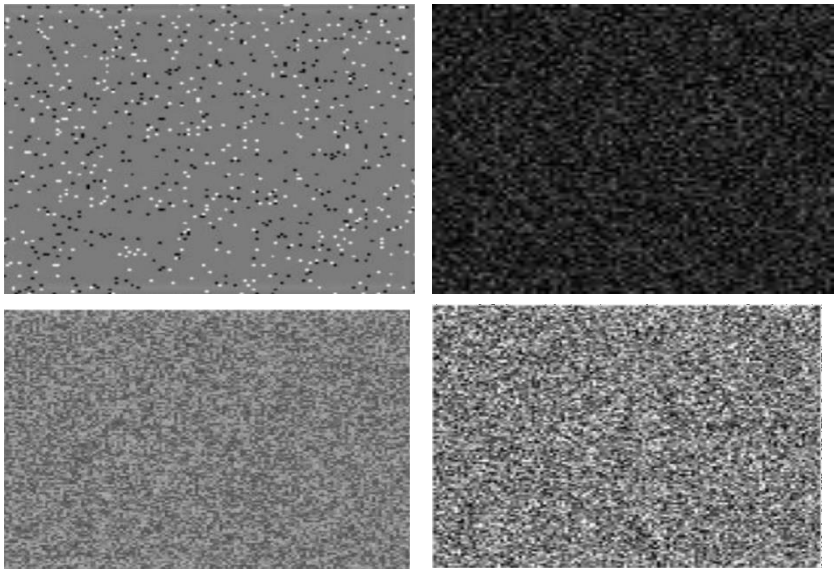
tradition P2P systems offer support for richer queries than just search by identifier, such as keyword search with regular expressions. Search techniques for these systems must therefore operate under a different set of constraints than techniques developed for persistent storage utilities. proposed System (See Figure 4) is an hybrid P2P system based on an organization of peers around super- peers according to their proposed themes, where super- peers are connected to a Knowledge-super-peer (KSP), the engine that specifies the super-peers having peers which may have relevant data to answer queries with minimum query tasks and, by consequence, improve answering time of the queries.

Knowledge -Super-Peer

The super-peer architecture allows the heterogeneity of peers by assigning more responsibility to peers able to assume them. Therefore, certain peers, called Knowledge super- peers, have an additional computing power and greater bandwidth, resources and performing administrative tasks. They are responsible of routing queries to relevant super-peers, allowing not only to reduce efforts of compilation of queries but also to prevent the spread of queries in the network. In each community, there is a super-peer connected to a Knowledge super-peer where have an index to identify super-peers that are most relevant to provide good results of queries.The building block (KSP) of the current P2P systems in the architecture (Distributed Knowledge - DK) is the notion of a super-peer-group, or a number of nodes (super-peer) that participate with each other for a common purpose to minimize the load in the KSP. Example : In this example we explain the query routing using KSP (Figure 4), A Peer P2 sends a query Q2 to his SP (SPA) that in its turn sends this query to KSP that belong to and also to peers of his community that are able to answer this query. This KSP analyzes the query to find the other SP using decision tree to send this query. Finally, the results will be sent to P2.



Network configuration and query routing (KSP approach).

II RELATED WORK

Paper 1:

Haifeng Guo, Ke Peng, Xiaolei Xu, Shuai Tao, Zhen Wu, "The Prediction Analysis of Peer-to-Peer Lending Platforms Default Risk Based on Comparative Models", Scientific Programming, vol. 2020.

The strategy to attract more investors with high expected rate of return also leads to higher default risk exposure. Notably, illustrates that the estimated coefficients for investment period, platform withdrawal score, the recommendation from customer, and ICP registration are all negative. The table also shows that the probability of default decreases by 5% from platform with no recommendation to the platform with positive customer review when other independent variables remain at their average level. Based on the result of regression, we conclude that high withdrawal score and positive consumer recommendation effectively alleviate information asymmetry.

Paper 2:

Kei Ohnishi, "Parallel Evolutionary Peer-to-Peer Networking in Realistic Environments", Applied Computational Intelligence and Soft Computing, vol. 2017, Article ID 4169152, 17 pages, 2017.In our previous study, we thought that

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for sustainable growth of the network society, a network adapting to demands of humans who are a leading part of the network society is needed. That is to say, we thought that the above-mentioned cooperation between a network and humans is a must for sustainable growth of the network society. The study in the present paper is also based on the same thought. Then, in our previous study, we proposed the evolutionary P2P networking technique that evolutionarily reconstructs topologies of a P2P network based on fitnesses given by nodes (users) in an on-line manner, which is called EP2P hereinafter.

Paper 3:

Jing Chen, Rui-Min Wang, Lei Li, Zhi-Hong Zhang, Xiao-She Dong, "A Distributed Dynamic Super Peer Selection Method Based on Evolutionary Game for Heterogeneous P2P Streaming Systems", Mathematical Problems in Engineering, vol. 2013, Article ID 830786, 9 pages, 2013.

In a dynamic evolutionary game, an individual from a population, which means a player in the game, who is able to reproduce itself through the process of mutation and selection, is called a replicator. In such case, a replicator with a higher payoff can reproduce itself faster. When the reproduction process takes place over time, this can be modelled by using a set of ordinary differential equations called replicator dynamics equations. Replicator dynamics refers to the growth rate of the peers using certain pure strategy is proportional to the difference between the average payoffs obtained by using the pure strategy and the average payoffs of the peers within the group, which is important for an evolutionary game since it can provide information about the population.

Paper 4:

Bartosz Polaczyk, Piotr Chołda, Andrzej Jajszczyk, "Peer-to-Peer Multicasting Inspired by Huffman Coding", Journal of Computer Networks and Communications, vol. 2013, Article ID 312376, 11 pages, 2013.

To evaluate benefits of the Huffmies concept in a video streaming network, we carried out simulations, obtained using a C# simulator developed by us. Two scenarios for performance investigation and one scenario for fault resilience were examined. For all simulations, a core network has been randomly constructed according to the model presented in [19], with symmetric 100 Mbit/s links between selected routers. Peers were grouped into five ISP networks (ISP A–E), where each ISP was connected to one of the backbone routers with a symmetric speed of 10 Mbit/s. To mimic a real-world environment, a number of customers and their access bandwidths were generated taking into account statistics offered by a connection speed estimation web service (http://www.netmeter.eu/). An interdomain network topology contains nine domains connected

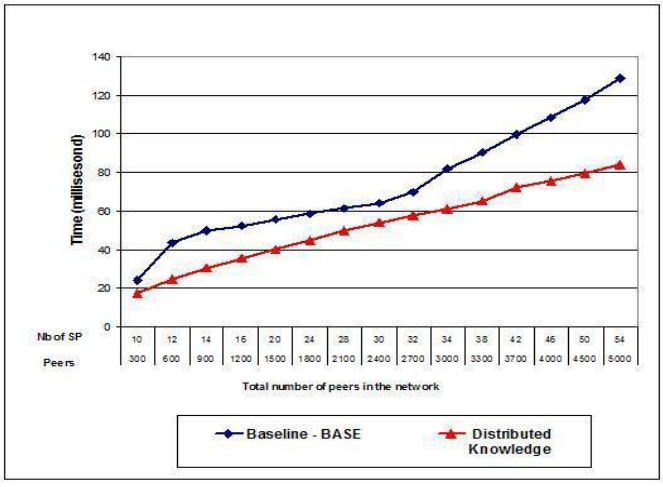
IV IMPLEMENTATION

Download and Install PyCharm and other Deep Learning Libraries -
Download the PyCyharm Python package and install other necessary libraries.

Experimental setup

This research was implemented using python programming language and with the help of several packages the better and accurate results were obtained. The packages included were Opencv, Matlab, Scikit and numpy. The operating system used was windows 7. The research was successfully concluded with two different input datasets.

Experimental Results



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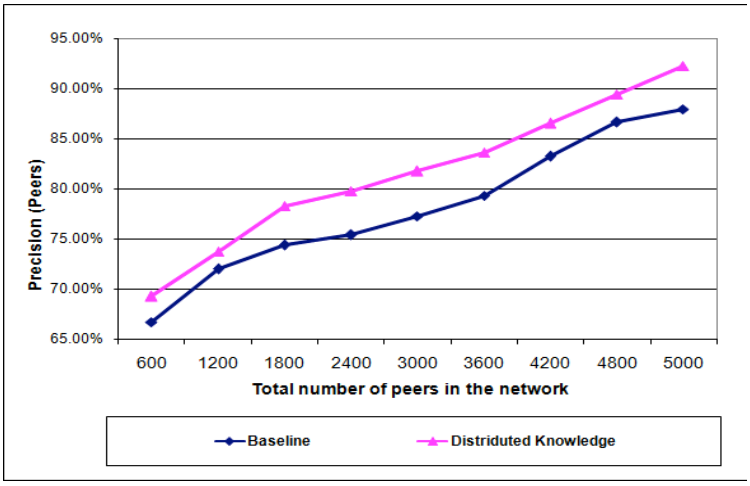
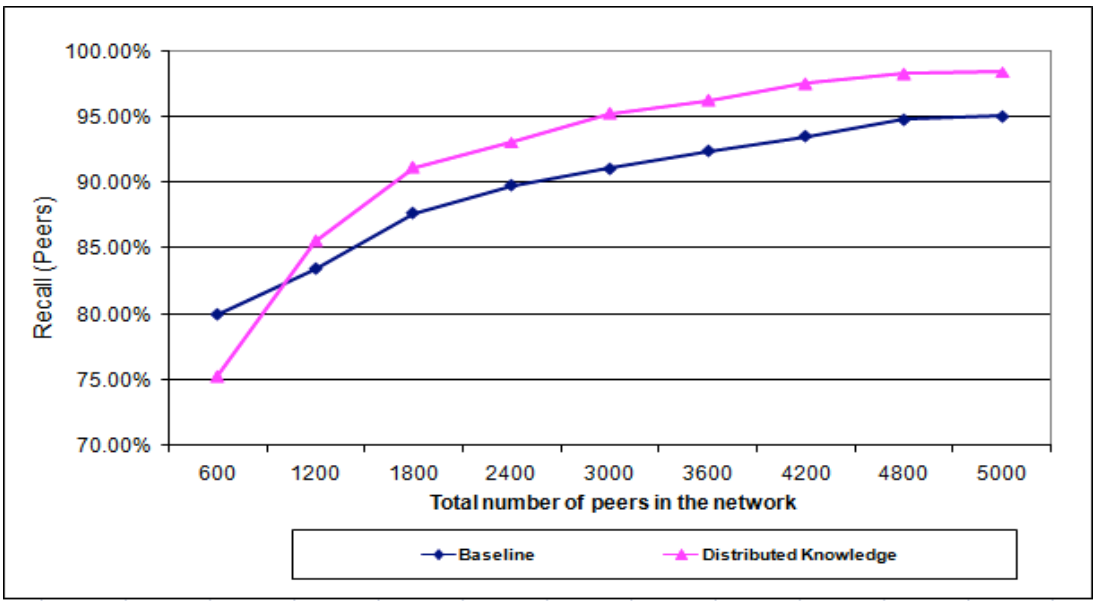
Response time



Precision rate



V CONCLUSION

Discovering domains on the fly are essential to perform domain directed searching. We show that while our techniques maintain the better quality of results as currently used techniques, our techniques reduce response time in P2P search (35 % at 1500 peers in DK architecture less then Baseline architecture). The advantage of our technique is the robustness in Queries routing. We experiment our technique using a Java implementation. The experiments involve communication in a large, wide-area cluster computer. We have implemented a new simulator by providing several functions many overlay protocols have in common like execution time, overlay message handling and concerning information retrieval like precision and recall. By analysis of the outcome of the experiments, we demonstrate that the system indeed shows the scalability and dependability properties predicted by our previous theoretical and simulation results. Through scalable design we have easily achieved to simulate a chord network with 5000 nodes in a reasonable amount of time. The large number of implemented overlay protocols and the availability to collect various statistical data make our simulator a powerful tool for the peer-to-peer research community. Another major direction for future work is in enhancing more the performance (Answering time) by logical restructure for our P2P network by using the minimum traverse between the super-peers (clusters). When the number of the Knowledge-super-peers increases, we jump to the logical restructure method.

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