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Design of systematic peer to peer network using routing queries

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Abstract: Finding a document or resource in an unstructured peer-to-peer network can be an exceedingly difficult problem. In this paper we propose a query routing approach that accounts for arbitrary overlay topologies, nodes with heterogeneous processing capacity, e.g., reflecting their degree of altruism, and heterogenous class-based likelihoods of query resolution at nodes which may reflect query loads and the manner in which files/resources are distributed across the network. The approach is shown to be stabilize the query load subject to a grade of service constraint, i.e., a guarantee that queries' routes meet pre-specified class-based bounds on their associated a priori probability of query resolution. An explicit characterization of the capacity region for such systems is given and numerically compared to that associated with random walk based searches. Simulation results further show the performance benefits, in terms of mean delay, of the proposed approach. Additional aspects associated with reducing complexity, estimating parameters, and adaptation to class-based query resolution probabilities and traffic loads are studied.

Keywords: P2P Networks, Queries, unstructured Network, class based bounds.

I. Introduction

Peer-to-peer networking is the utilization of the relatively powerful computers (personal computers) that exist at the edge of the Internet for more than just client-based computing tasks. The modern personal computer (PC) has a very fast processor, vast memory, and a large hard disk, none of which are being fully utilized when performing common computing tasks such as e-mail and Web browsing. The modern PC can easily act as both a client and server (a peer) for many types of applications.

The typical computing model for many applications is a client/server model. A server computer typically has vast resources and responds to requests for resources and data from client computers. Client computers initiate requests for resources or data from server computers. A good example of the client/server model of computing is Web browsing. Web servers on the Internet are typically high-end dedicated server computers with very fast processors (or multiple processors) and huge hard disk arrays. The Web server stores all of the content associated with a Web site (HTML files, graphics, audio and video files, etc.) and listens for incoming requests to view the information on a particular Web page. When a page is requested, the Web server sends the page and its associated files to the requesting client.

- Peer-to-peer networking has the following advantages over client/server networking:
- Content and resources can be shared from both the center and the edge of the network. In client/server networking, content and resources are typically shared from only the center of the network.
- A network of peers is easily scaled and more reliable than a single server. A single server is subject to a single point of failure or can be a bottleneck in times of high network utilization.
- A network of peers can share its processor, consolidating computing resources for distributed computing tasks, rather than relying on a single computer, such as a supercomputer.
- Shared resources of peer computers can be directly accessed. Rather than sharing a file stored on a central server, a peer can share the file directly from its local storage.
- Peer-to-peer networking solves the following problems:

II. P2P Networks

Windows Peer-to-Peer Networking

Windows Peer-to-Peer networking is a developer platform to create peer-to-peer applications for computers running Windows XP with Service Pack 2, Windows XP

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Professional x64 Edition, Windows XP with Service Pacl and the Advanced Networking Pack for Windows XP, Windows Vista™. The long-term goal of Windows Peer-Peer networking is the following:

To enable people to communicate securely a share information with one another without a dependence centralized servers, but to work even better when servers present.

Computers running Windows Vista already ha Windows Peer-to-Peer networking installed. For comput running Windows XP with SP2, do the following to inst Windows Peer-to-Peer Networking:

- Click **Start**, click **Control Panel**, and then cl **Add or Remove Programs**.
- Click **Add/Remove Windows Components**.
- In **Components**, click **Networking Services** (do not select its check box), and then click **Detail**
- Select the **Peer-to-Peer** check box, and then cl **OK**.
- Click **Next**, and then follow the instructions in wizard.

III. System Analysis

EXISTING SYSTEM:

- In a purely unstructured P2P network, a node only knows its overlay neighbors. With such limited information, search techniques for unstructured networks have mos been based on limited-scope flooding, simulated rand walks, and their variants.
- Much research in this area has focused evaluating these search techniques based on the contact tir i.e., number of hops required to find the target, using spectral theory of Markov chains on (random) graphs, e.g., Unfortunately in heterogenous settings where serv capacity or resolution likelihoods vary across peers, su search techniques perform poorly under high query loads.

DISADVANTAGES OF EXISTING SYSTEM:

- In structured networks the difficulty search/discovery is shifted to that of maintaining structural invariants required to achieve efficient
- In query resolution particularly in dynamic settings with peer/content churn or when reactive load balancing required.
- Complexity problem will be also raised.

PROPOSED SYSTEM:

- Given a hybrid P2P topology and query classification, we propose a novel query resolution mechanism which stabilizes the system for all query loads within a 'capacity region', i.e., the set of loads for which stability is feasible.
- Essentially, our policy is a biased random walk where forwarding decision for each query is based on instantaneous query loads at super-peers.
- To balance the load across heterogeneous super-peers, the policy aims at reducing the differential backlog at neighboring super-peers, while taking into account the class and history information to improve the query's resolvability.
- Our policy draws upon standard backpressure routing algorithm, which is used to achieve stability in packet switching networks,
- We propose a query forwarding mechanism for unstructured (hybrid) P2P networks with the following properties.
- Our approach is fully distributed in that it involves information sharing only amongst neighbors, and achieves stability subject to a Grade of Service (GoS) constraint on query resolution. The GoS constraint corresponds to guaranteeing that each query class follows a route over which it has a reasonable 'chance' of being resolved.

We provide and evaluate several interesting variations on our stable mechanism that help significantly improve the delay performance, and further reduce the complexity making it

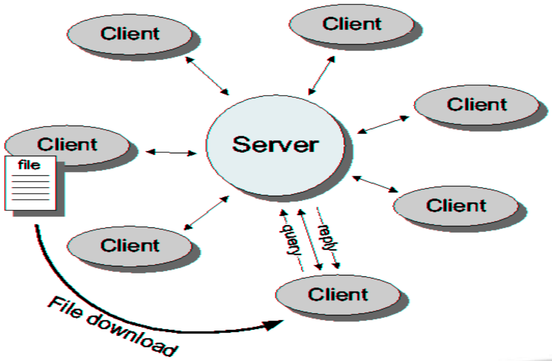
ADVANTAGES OF PROPOSED SYSTEM:

- Reducing complexity
- Estimating parameters, and adaptation to class-based query resolution probabilities and traffic loads are studied.
- Stable Policies
- Estimating Query Resolution Probabilities
- Alternate Grades of Service Strategies
- It is based on classifying queries into classes
- The GoS constraint corresponds to guaranteeing that each query class follows a route over which
- It has a reasonable 'chance' of being resolved
- This provides a basis for substantially reducing complexity by approximations

ALGORITHM

- *Basic Backpressure Algorithm*
- The weights used in above algorithm for each link are different from those used in traditional multi-commodity backpressure algorithm

System Architecture



IV. SUMMARY

Windows Peer-to-Peer Networking is a new platform supported by Windows XP and Windows Vista that allows better utilization of PC computing resources and the creation of a new wave of peer applications for RTC, collaboration, content distribution, distributed processing, and improved Internet technologies. Windows Peer-to-Peer networking uses IPv6, which restores the end-to-end computing model. With Teredo, IPv6 nodes can even communicate across one or more IPv4 NATs. For a serverless name resolution and peer discovery mechanism, Windows Peer-to-Peer networking uses PNRP. To associate peer members together to securely share data, Windows Peer-to-Peer networking uses graphing (for an efficient flooding topology) and grouping (for authentication and secure communication). Group members maintain a replicated store containing all the shared data of the group and can search the store using keywords, attributes, and common logical operators.

V. CONCLUSION

Firstly, files are distributed among users of the system (peers). The notion of decentralized storage allows for sharing a very large number of files, where storage space on centralized servers is typically limited. In a peer-to-peer system, if you wish more storage space, you need only add another node. Another consequence of this is that such a system quite often has a built-in redundancy. Having files on multiple nodes also distributes the download traffic. Unlike a centralized system where all download requests would go to the central server, in peer-to-peer each download request is passed among peers. This may increase overall network traffic, but also has a good chance of relieving system bottlenecks that often occur in client/server systems.

The project has covered almost all the requirements. Further requirements and improvements can easily be done since the coding is mainly structured or modular in nature. Improvements can be appended by changing the existing modules or adding new modules. One important development that can be added to the project in future is secure the data from the External attack and networks also have to connect the network with more unstructured system

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