Research Article Impact Factor: 0.621 ISSN: 2319-507X
Pragati Chandankhede, IJPRET, 2014; Volume 2 (8): 727-733 IJPRET

INTERNATIONAL JOURNAL OF PURE AND APPLIED RESEARCH IN ENGINEERING AND TECHNOLOGY

A PATH FOR HORIZING YOUR INNOVATIVE WORK

NONTRIVIAL CHALLENGES IN PEER TO PEER APPLICATION WITHIN NETWORK AND DESIGN ISSUE

PRAGATI H. CHANDANKHEDE, NAMRATA A. SABLE, JAGRUTI S. WANKHADE

Assistant Professor, Department of Information Technology, J. D. I. E. T. , YAVATMAL,

S. G. B. A. U. , AMRAVATI.

Accepted Date: 15/02/2014 ; Published Date: 01/04/2014

Abstract: During last few decades there are large technical advancement in the direction of real time application. Peer-to-peer based transmission have come into view as a capable technique for running various application on network which has various advantages such as flexibility scalability, and these application are also useful in dealing with dynamics resource sharing . Though there is tremendous popularity of peer-to-peer applications such as multiplayer online game, file download and voice over IP, there are several challenges. The key challenges are i) to have authentication among peer of both end, ii) to balance and to self organize among the highly passing population of users without the use of a central server, iii)high bandwidth for QoS(Quality of Service). This paper explores the challenges to Peer to peer application and put in the picture the problems involved for providing design issue to such application.

Keywords: Peer, QoS, video streaming, network.

Corresponding Author: MISS. PRAGATI H. CHANDANKHEDE

Access Online On:

www.ijpret.com

How to Cite This Article:

Pragati Chandankhede, IJPRET, 2014; Volume 2 (8): 727-733

PAPER-QR CODE

INTRODUCTION

Peer-to-peer (P2P) is an network , that is provided by usual client-server design. Being a successful model client server fails due to lack of scalability, at the same time it requires good administration. key problem also arise due to unused resourses at network edge. Peer to peer address these limitation. Whereas decentralized model is used by P2P networks. Thus in this case each machine is work as a peer, plays the role of a client . At the same time that machine is playing role of server. This also means that, one peer be able to commence requests to further peers, and similarly peer can act in response to inward requests from other peers on the network. With the difference to client server architecture, the performance of peer to peer network always increased as the additional peer are always added to the network. Every peer is being able to upload and download at the same time, and in a route similar to this, new machines(peer) can join the group while old peers leave at any time. This lively reformation of peer members in group is transparent to end-users.

The principle underlying peer to peer is each node in peer to peer network take part in the network by offering and using services at the same time. Thus peer-to-peer (P2P) systems can be thought of as a distributed systems without any centralized control or hierarchical organization, where the software running at each node is equivalent in functionality.

Peer to peer network are built on application layer, and for message transfer underlying layer are used and hence they are also called as overlay network. Systems (e.g., Gnutella) have used overflow for message routing in the network. Several node receiving a search request can transmit this message to all its neighbors. The message has a time-to-live value which is reduced at every hop to prevent messages from being routed in the network forever. These systems cannot give any formal guarantees that a message in the network will reach its destination. Furthermore, broadcast messages impose an unnecessary traffic burden on the network .

I. EMERGENCE AND GROWTH

The first appearance of open source systems such as Napster in 1999 radically changed file-sharing mechanisms. The traditional client-server file sharing and distribution approach using protocols like FTP (File Transfer Protocol) was supplemented with a new alternative — P2P networks. At the time, Napster was used extensively for the sharing of music files. Napster was shut down in mid-2001 due to legal action by the major record labels. The shutting of Napster did not stop the growth of P2P applications. A number of publicly available P2P systems have appeared in the past few years, including Gnutella, KaZaA, WinMX and

BitTorrent, to name but a few. From analysis of P2P traffic in 2007, BitTorrent is still the most popular file sharing protocol, accounting for 50-75% of all P2P traffic and roughly 40% of all Internet traffic.

A P2P network itself is only a form of technology, and is not related to disputes over content and intellectual property rights. However, there have been court cases in Hong Kong against illegal P2P activities. In 2005, a Hong Kong resident was convicted ofbreaching the Copyright Ordinance by uploading illegal copies of copyrighted works to the Internet using the BitTorrent peer-to-peer file sharing program, and making files available for download by other Internet users.Peer-to-Peer Live streaming and Video on Demand is the most popular media applications over the Internet in recent years.

II. CLASSIFICATION OF PEER TO PEER ARCHITECTURE

P2P architectures can be broadly categorized as structured and unstructured overlays. Unstructured overlays are attractive as they are relatively simple to construct and maintain. Moreover, they distribute resource information across many nodes in the system while providing resilience and load balancing, and hence the performance is unpredictable. Structured P2P systems are known for high scalability and some guarantees on performance, and hence are utilized in large-scale and relatively robust environments. These systems use a Distributed Hash Table (DHT) to index resourse. There is less overhead of overlays and hence performance is predictable. Examples of unstructured P2P is Gnutella and structured P2P is Kademila, chord etc.

III. CHALLENGES

A. RESOURSE UTILIZATION

Emerging collaborative P2P applications will require discovery and utilization of different types of resources to accomplish greater tasks that cannot be accomplished with traditional systems. Diversity in resources, application requirements, and complex inter-resource relationships present new challenges not encountered in conventional P2P systems. As per the analysis of two real-world systems, PlanetLab and SETI@home, shows that multi-attribute resource and query characteristics diverge substantially from conventional assumptions . For example, resource attributes and their rate of change are somewhat correlated and follow a mixture of probability distributions (e.g., Gaussian)

B. CATEGORICAL ATTRIBUTES

CPU architecture and operating system, are highly skewed and do not fit a standard distribution. Rate of change in dynamic attributes, e.g., free CPU, memory, and bandwidth differ from one attribute/node to another, and some of the attributes changed very frequently. These factors contribute to a large resource-advertising cost. Moreover, it is typically assumed that RSs advertised by gossiping and random walk or indexed in a DHT will expire after a predetermined timeout. However, given that rate of change in dynamic attributes differ from one attribute to another and from one resource to another, it is nontrivial to determine a suitable timeout for each attribute.

C. AUTHENTICATION

The lack of a central authority makes authentication in a pure P2P network difficult. Without authentication, adversary nodes can spoof identity and falsify messages in the overlay. This enables malicious nodes to launch man-in-the-middle or denial-of-service attacks. Douceur showed in that without a trusted agency which certifies identities, adversary nodes can control a large fraction of an overlay network.

D. CONTENT SHARING

Peer-to-Peer (P2P) content sharing service has grown in significance on the Internet, both in terms of the number of participating users and the traffic volume. However, due to the self-organization and self-maintenance nature of P2P overlay networks, each participating user has to manage the potential risks involved in the application transactions without adequate experience.

E. CONTENT DISTRIBUTION

Content distribution via peer-to-peer networks goes a step beyond towards a completely distributed structure involving the resources of the peers interested in the content. P2P content distribution allows for more flexibility in the overlay network, which may be structured according to different content e.g. by trackers for each item in the Bit Torrent network or according to other criteria. The size of the overlay can automatically adjust to the population of peers and thus user demand with a replication strategy for the data being set up by the P2P protocol.

IV. VIDEO STREAMING BANDWIDTH MANAGEMENT FOR PROVIDING QUALITY OF SERVICE:

Major challenge for server based video streaming requires scalability. A good quality of video stream requires high bandwidth. The major problem in video server that is

CDN(Content Delivery Network) approach, as the number of client increases the bandwidth must proportionally increases. By sharing the load among various locations closer to the user-end, CDNs can deliver content to users in a timely manner. Content replication enhances robustness so that CDNs can maintain reliable service in case of failures. This makes server based video streaming solution more expensive.

V. THREATS INVOLVED IN P2P SYSTEM:

Threats specific to P2P include subversion of the identity-mapping scheme attacks on the overlay network routine scheme, bootstrapping communications in the presence of malicious first-contact nodes, identity enforcement (Sybil attacks), traffic analysis and privacy violation by intermediate nodes, and free riding by nodes that refuse to route calls or otherwise participate in the protocol other than to obtain service for themselves (selfish behavior). The modern P2P systems need to deal with selfish (a.k.a "leechers" or "free-riders") or malicious users1, P2P worms , Byzantine faults and Sybil attacks, Eclipse attacks, flash crowds.

VI. DESIGN ISSUE FOR SECURITY IN PEER TO PEER SYSTEM

The key problem in a peer-to-peer system is to organize the peers into an overlay for disseminating the data stream. Following are the important criteria for overlay construction and maintenance.

A. Overlay efficiency

The overlay constructed must be efficient both from the network and the application perspectives. For broadcast data, high bandwidth and low latencies aresimultaneously required. However, given that applications arereal-time but not interactive, a startup delay of a few seconds can be tolerated.

B. Scalability and load balancing

Since broadcast systems can scale to tens of thousands of receivers, the overlay must scale to support such large sizes, and the overhead associated must be reasonable even at large scales.

C. Self-organizing

The construction of overlay must take place in a distributed fashion and must be robust to dynamic changes in group membership. Further, the overlay must adapt to long-term variations in Internet path characteristics (such as bandwidth and latency), while being resilient to

inaccuracies. The system must be self-improving in that the overlay should incrementally evolve into a better structure as more information becomes available.

NEW TECHNIQUE AS A SOLUTION TO VARIOUS CHALLENGES-TRUST MANAGEMENT SCHEME:

Current research efforts has overcome the pitfalls of peer to peer application by trust management techniques to recognize trustworthy peers on P2P network. For collecting peers trust values in the P2P network, majority of approaches presented in this area use special algorithms. In this paper, we present a trust based content distribution for peer-to-peer overlay networks, which is built on the trust management scheme. The main concept is, before sending or accepting the traffic, the trust of the peer must be validated. Based on the success of data delivery and searching time, we calculate the trust index of a node. Then the aggregated trust index of the peers whose value is below the threshold value is considered as distrusted and the corresponding traffic is blocked. To evaluate traffic from other peers and dynamically update their trust values by a peer, this trust scheme is used.

CONCLUSION:

Despite of several challenges, P2P networks is the efficient downloading and sharing of files and data architecture . Users needs to be fully aware of the security threats associated with this technology. Security measures and adequate prevention should be implemented to avoid any potential leakage of sensitive and/or personal information, and other security breaches. Before deciding to open firewall ports to allow for peer-to-peer traffic, system administrators should ensure that each request complies with the corporate security policy and should only open a minimal set of firewall ports needed to fulfil P2P needs. For end-users, including home users, care must be taken to avoid any possible spread of viruses over the peer-to-peer network.

REFERENCES

1. J. Liu, B. Li, and Y.-Q. Zhang, “Adaptive video multicast over the Internet”, IEEE Multimedia, vol. 10, no. 1, pp. 22-31, Jan./Feb. 2003.

2. N. Magharei, R. Rejaie, and Y. Guo, “Mesh or Multiple-tree: A comparative study of live P2P streaming approaches”, inProc. of IEEE INFOCOM’07, Anchorage, Alaska, USA, May 2007.

3. B. Cohen. Incentives build robustness in bittorrent.http://bitconjurer.org/ BitTorrent/ bittorrentecon.pdf May 2003.

4. Padmanabhan, V. N., Wang, H. J., Chou, P. A., & Sripanidkulchai, K.(2002). "Distributing streaming media content using cooperative networking". Proceedings of the 12th International Workshop on Network and Operating Systems Support for Digital Audio and Video, 177-186.

5. M. Castro, P. Druschel, A-M. Kermarrec, A. Nandi, A. Rowstron,and A. Singh. Splitstream: High-bandwidth content distribution in a cooperative environment. In IPTPS'03 , 2003.

6. H. Zheng, Y. Zhang, Y. Chen, etc. Measure and Test Distributed Service in China, Aisa FI 2009

7. A. A. Hamra, E. W. Biersack, and G. Urvoy-Keller.(2004)." A pull-based approach for a vod service in p2p networks". In IEEE HSNMC, Toulouse, France.

8. C. Wu, B. Li, and S. Zhao(2008). "Multi-channel live p2p streaming: refocusing on servers". In Proceedings of IEEE INFOCOM'08.

9. http://www.gnutella.com

10. http://www.skype.com