IJCSN International Journal of Computer Science and Network, Volume 4, Issue 2, April 2015
ISSN (Online) : 2277-5420 www.IJCSN.org
Impact Factor: 0.417

Multi-Message Gossiping, With The Assistance Of Mobility

[1] Sanjiwani Gugale, [2] Rupali Dhone, [3] Datta Khedakar

[1,2,3] Department of Computer Engineering, Savitribai Phule Pune University, Pune
Pune, Maharashtra, India

Abstract - In this paper, the problem of broadcasting multiple messages from one user to many users. Each user can communicate with all other users by exchanging message, video, audio, images or any other file with it. In this paper we communicate overhead of gossip-based information. We communicate in a large n-user wireless network in which k user wish to share information with all other user. Gossiping has been widely regarded as simple and efficient method to improve quality of service in large scale wireless network. Gossip is a power paradigm in distributed computing. Gossip algorithm spread messages obliviously without centralized control or management with remarkable speed and with inherent fault tolerance. We investigate the dissemination of information or data in large wireless network where user contacts with each other in a random uncoordinated manner. While transferring data from one user to another user, we apply encryption and decryption over the data.

Keywords - *Gossip Algorithms, Information Dissemination, Probabilistic Broadcasting, Wireless Random Network, Mobility.*

1. Introduction

In wireless networks, a variety of scenarios require users to share their individual information or resources with each other for mutual benefits. Information spreading or dissemination in a large network is typically achieved when each user shares its own information or resources with each other user [2]. Broadcasting is an important communication operation in many multi-user systems. Broadcasting refers to a method of transferring a message to all recipients simultaneously. We use the broadcasting concept in this project for gossiping or Communication between multiple users using mobility. Mobility is a wireless device from which we can communicate or gossiping with each other. We design a simple distributed gossip style protocol that achieves near optimal spreading rate for multiple message dissemination or spreading, with the assistance of mobility.

A partial list includes file sharing and rumor spreading [2]–[5], distributed computation and parameter estimation [4]–[5], and scheduling and control [6], [7].
In this paper, we design a gossip style protocol. In the gossip style protocol we broadcast a message to all the other users to achieve the near optimal spreading rate for communicating or gossiping between the users, with the assistance of mobility. And the velocity is also reduced.

In this paper, we investigate the random-push gossip based algorithm where message selection is depends on the users and select messages randomly. This means that, we are using a random-push gossip based algorithm for broadcasting the message to all the users.

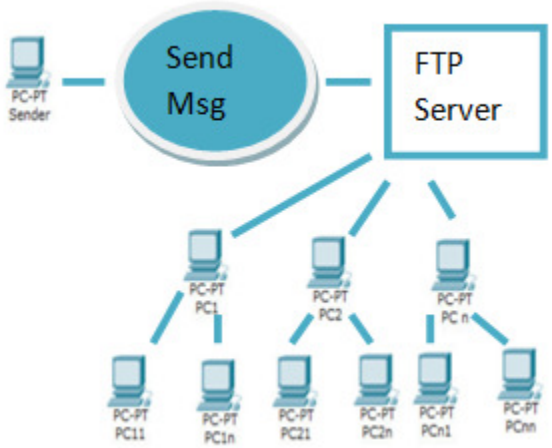

Fig.1. System Architecture

Figure shows the system architecture of our system.
In this paper, we can apply the encryption and decryption over the data send by the users. User can send the messages as well as video, audio, images and files to the all other users.

1.1 Encryption

Encryption is the most effective way to achieve data security. Encryption is the process of encoding information or messages in such a way that only authorized users can read it. In an encryption scheme, the information or message, referred to as plain text, and this plaintext is encrypted using an DES or AES encryption algorithm, generating the cipher text that can only be read if information is decrypted.

1.2 Decryption

Decryption is the process of transforming data that has been rendered unreadable through encryption back to its unencrypted form. In decryption, the system converts and extracts the encrypted data and transforms it to original format i.e texts and images that are easily understandable not only by the reader but also by the system. Decryption may be accomplished automatically or manually. It may also be performed with a set of passwords or keys.

2. Literature Survey

[2]In this paper, we use the random-push gossip-based algorithm where message selection is based on the user's own state in a random fashion. We propose an efficient dissemination strategy that random gossiping and alternate between individual message flooding. We show that this scheme achieves the optimal spreading rate as long as the velocity satisfies v(n) = !(p log n/k). we design a simple the mobility with distributed gossip-style protocol that achieves near-optimal spreading rate for multi message dissemination. In this protocol, each user acts as an advocate for its initial piece and the

We study the problem of one by one or simultaneously disseminating multiple messages in a large wireless Multiple Rumor Mongering" we consider a scenario where there are multiple nodes in the wireless network and also multiple user, but not all messages are with all the nodes to start with. We considered the problem of disseminating multiple messages simultaneously in a large wireless network using gossip-based dissemination mechanisms. In this paper information dissemination schemes based on the concepts of network coding, instead of a naive store and forward mechanisms.

[4] A Network Coding Approach to Optimal associated with a fixed adjacency matrix or static case full mobility – is not clear. Most existing results on uncoded random gossiping center on evolutions homogeneous graph structure , which cannot be readily extended for dynamic topology changes. To the best of our knowledge, the first work to analyze gossiping with mobility was which focused on energy-efficient distributed averaging instead of time-efficient message propagation. Another line of work by Clementi. Investigate the speed limit for information flooding over Markovian evolving graphs, but they did not study the spreading rate under multi-message gossip.

[11]Motivated by applications to wireless networks and sensor, peer-to-peer, we study distributed algorithms, also known as gossip algorithms, for exchanging information. We use this connection to scaling of gossip algorithms on two popular networks and study the performance Wireless Networks. The goal in this setting is to communication is done as quickly and efficiently as possible and design algorithms so that the desired computation. This paper undertakes an in-depth study of gossip algorithms for averaging in an arbitrarily connected network of nodes and the design. [12]This paper investigates the dissemination of multiple pieces of data in large wireless networks where users upload one piece per unit time and users contact each other in a random uncoordinated manner. This paper investigates data dissemination in structured networks. In this work investigated the speedup achieved in file dissemination and the performance of one-sided piece selection Protocols to designed the efficient piece selection protocol INTERLEAVE.

3. Existing system

In wireless ad hoc, a variety of scenarios require agents to share their individual information or resources with each other for their benefits. A partial list includes rumor spreading and file sharing, distributed computation and parameter estimation, and control and scheduling. Because of the huge centralization overhead and unpredictable dynamics in large or complex networks, it is usually more practical to spread or disseminate information and exchange messages in a decentralized and asynchronous manner to combat unpredictable topology changes and the lack of global state data or information. This motivates the exploration of dissemination or spreading information strategies that are inherently simple, asynchronous and distributed while achieving optimal spreading rates.

4. Proposed system

Random gossiping achieves a spreading time for all-to-all spreading over a complete graph [15], [16], this allows near-optimal spreading time to be achieved within a logarithmic factor from the fundamental lower limit _(n). However, how much benefit can be obtained from more realistic mobility which may be significantly lower than idealized best- Recently, Pettarinet. al explored the information spreading over sparse mobile networks with no connected components of size (log n), which does not

account for the dense (interference-limited) network model we consider in this paper . We can transfer or broadcast the messages as well as the video, audio, images and files to the all other users. While transferring the data or information from one user to multiple users, we apply the encryption and decryption over it.

4.1 Modules

4.1.1 Physical-Layer Transmission Strategy

In order to achieve efficient spreading, it is natural to resort to a decentralized transmission strategy that supports the order-wise largest number of concurrent successful transmissions per time instance. The following strategy is a candidate that achieves this objective with local communication. UNICAST Physical-Layer Transmission Strategy: At each time slot, each node i is designated as a sender independently with constant probability and a potential receiver otherwise. Here, $\theta <$ 0:5 is independent of n and k. Every sender i attempts to transmit one message to its nearest potential receiver j(i). This simple "link" scheduling strategy, when combined with appropriate push-based message selection strategies, leads to the near-optimal performance in this paper. We note that the authors in [1], by adopting a slightly different strategy in which _n nodes are randomly designated as senders have shown that the success probability for each unicast pair is a constant.

4.1.2 Message Selection Strategy

We now turn to the objective of designing a one-sided message-selection strategy (only based on the transmitter's current state) that is efficient in the absence of network coding. We are interested in a decentralized strategy in which no user has prior information on the number of distinct messages existing in the network. One common strategy within this class is: [1]RANDOM PUSH Message Selection Strategy: In every time slot: each sender i randomly select one of the messages it possesses for transmission.

4.1.3 Multi-Message Dissemination in Static Networks with RANDOM PUSH

Now we turn to multi-message spreading over static networks with uncoded random gossiping. Our analysis is developed for the regime where there is a k distinct message that satisfies, which subsumes most multi-spreading cases of interest. This implies that simple RANDOM GOSSIP is inefficient in static wireless networks, under a message injection scenario where users start message dissemination sequentially [1]. The setting is as follows: The sources inject their messages into the network at some time prior to the k-th source. At a future time when each user in the network has at least the k-th message (denoted by M_) is injected into the network. This pattern occurs, for example, when a new message is injected into the network much later than other messages, and hence all other messages have been spread to a large number of users which is a polynomial factor away from the universal lower limit _ (k). The main objective of analyzing the above scenario is to uncover the fact that uncoded one-sided random gossiping fails to achieve near-optimal spreading for a large number of message injection scenarios over static networks.

5. Conclusion

Here, we design a simple distributed gossip style protocol that achieves near optimal spreading rate for multiple message dissemination using the mobility. And even with the limited degree of velocity in mobile networks. We can transfer messages i.e. text as well as files, images, audio and videos. And here we apply encryption and decryption while sending and receiving messages, files etc to one user to multiple users. We design a simple distributed gossip style protocol, in which we transfer the messages or information from one user to multiple users through wireless network i.e. wifi and with the assistance of mobility.

Acknowledgment

First and foremost we offer our sincerest gratitude to our college, JSPM's ICOER and our department of Computer Engineering which has provided the support and equipment We have needed to complete my work. We extend my heartful gratitude to my guide, Prof. R.N.Phursule and department Computer Engineering, who has supported us throughout our research with their patience and knowledge.

References

[1] IEEE transactions on information theory vol:59 no:6 year 2013, "On The Role of Mobility for multi-message Gossip", Yuxin Chen, Sanjay Shakkottai and Jeffrey G. Andrews.

[2] IEEE INFOCOM 2011 "Sharing Multiple Messages over Mobile Networks", Yuxin Chen, Sanjay Shakkottai and Jeffrey G. Andrews.

[3] the 41st Annual Symposium on Foundations of Computer Science, pp. 565–574, 2000."Randomized rumor spreading," R. Karp, S. Shenker, C. Schindelhauer, and B. Vocking.

[4] J. Tsitsiklis, Problems in decentralized decision making and computation, MIT, PhD dissertation, LIDS, Cambridge, 1984.

[5] IEEE Transactions on Information Theory, vol. 56, no. 1, pp. 634 –647, January 2010.K. Jung, J. Shin, and D. Shah, "Distributed averaging via lifted chains".

[6] ACM SIGMETRICS, pp. 27–38, 2006. E.Modiano, G. Zussman, and D. Shah, "Maximizing throughput in wireless networks via gossiping".

[7] ACM/IEEE Transactions on Networking, vol. 18, no. 2, pp. 638–51, Apr. 2010. A. Eryilmaz, E. Modiano, D. Shah, and A. Ozdaglar, "Distributed cross layer algorithms for the optimal control of multihop wireless networks".

[8] IEEE Transactions vol. 3, no. 1, pp. 1–125, April 2009. D. Shah, "Gossip algorithms," Trends and Foundations in Networking".

[9] IEEE Transactions on Information Theory, vol. 53, no. 12,pp. 4640–4654, Dec. 2007. S. Sanghavi, B. Hajek, and L. Massoulie, "Multiple messages with Gossiping".

[10] Revised 21 October 2013; Accepted 22 October 2013 Gang Wang, 1 Zun Lin,1 Wenyang Guan,2 and FengWang "The Performance of Multimessage Algebraic Gossip in a Random Geometric Graph".

[11] IEEE transactions, vol. 52, no. 6, June 2006 S. Boyd, Fellow, IEEE, A. Ghosh, Student Member, IEEE, B. Prabhakar, Member, IEEE, and D. Shah "Randomized Gossip Algorithms".

[12] IEEE transactions on information theory, vol. 53, no. 12, December 2007. S. Sanghavi, Member, IEEE, B. Hajek, Fellow, IEEE, and L. Massoulie," Gossiping With Multiple Messages".

[13] IEEE Transactions, Supratim Deb and Muriel M´edard Laboratory for Information & Decision Systems Massachusetts Institute of Technology Cambridge," Algebraic Gossip.