LABELING BEHAVIOR AND AGGLOMERATION IN PEER TO PEER TO NETWORK USING DIFFERENTIAL GOSSIP ALGORITHM

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ABSTRACT: In a peer-to-peer system, a node should estimate reputation of other peers not only on the basis of its own interaction, but also on the basis of expression of other nodes. Reputation aggregation mechanism implements strategy for achieving this. Reputation aggregation in peer to peer networks is generally a very time and resource consuming process. Moreover, most of the methods consider that a node will have the same reputation after aggregation with all the nodes in the network, which is not true. This proposes a reputation aggregation algorithm that uses a variant of gossip algorithm called differential gossip. The estimate of reputation is considered to be having two parts, one common component which is same with every node, and the other one is the information received from immediate neighbors based on the neighbors' direct interaction with the node. The differential gossip is fast and requires a lesser amount of resources. This mechanism allows computation of independent reputation value by every node, of every other node in the network. The differential gossip trust has been investigated for a power law network formed using preferential attachment (PA) Model. The reputation computed using differential gossip trust shows good amount of immunity to the collusion.

1. INTRODUCTION

Peer to peer systems have attracted considerable attention in recent past as they are more scalable than the client-server systems. In peer-to-peer system, there is no server. Each node acts as a server as well as a client. Free riding has emerged as a big challenge for peer-to-peer systems. Tendency of nodes to draw resources from the network and not giving anything in return is termed as Free Riding. Usually the nodes will have conflict of interests, thus the selfish behaviour of nodes leads to the problem of free riding. The behaviour of nodes can be explained by famous prisoners' dilemma. In a file sharing network, if nodes are considered as players, their Nash Equilibrium (NE) will be the strategy where none of them are willing to share the resources. Experimental studies on Gnutella network have confirmed this. In order to overcome the problem of free riding, peer-to peer networks can use trust or reputation management systems. As a result, one can also have the added advantage of resilience against certain kind of attacks. Such reputation management systems have been in use in the e-commerce portals like e-bay they are based on client server architecture and are much easier to implement and manage. When reputation management systems are deployed, rogue peers will start using collusion to bypass it. A reputation management system should be able to operate even with collusion.

2. EXISTING SYSTEM

Tendency of nodes to draw resources from the network and not giving anything in return is termed as Free Riding. Usually the nodes will have conflict of interests, thus the selfish 33 behavior of nodes leads to the problem of free riding. The behavior of nodes can be explained by famous prisoners' dilemma.

DISADVANTAGES:
1. Resources utilization is more.
2. Delay issues for reliable services.
3. Collusion issues.
4. Uploads are more and downloads are less.

3. PROPOSED SYSTEM

We have proposed an algorithm that discourages the free riding and reduces the collusion significantly in networks with power law degree distribution. The proposed algorithm does not require any central server or repository. The communication and computation cost for trust aggregation is low, and the aggregation is normally completed in reasonable time. We can observe that the human social network already have a mechanism to reduce free riding and collusion. In human network, when one wants to know about another person's reputation, he uses three kinds of quantities. First, the trust observed in direct interaction with that person, second the trust observed by his friends in their direct interaction with that person; and third, the general perception in the society about him. Based on the understanding developed by observing the human network, in this paper, we propose a method which does the weighted summation of three quantities namely, the trust estimated by a node directly, trust reported by neighbors and average of trust reported by everyone in the network. Estimation of third quantity is quite resource consuming in peer-to-peer networks. Therefore, we propose to use a variation of normal push gossip algorithm for this.

ADVANTAGES:
- Minimizes number of uploads and maximizes number of downloads.
- Reducing time to get reliable services.
- Consuming resources utilization.

Modules Description:
1. System model
2. Aggregation of trust
3. Differential gossip trust
4. Differential reputation algorithm

System Model:
A connection from node 'A' to node 'B' implies that node 'A' is maintaining the address of node 'B' as a neighbor node. Peers in the network are rational, i.e., they are only interested in their own welfare. Every node is connected to its neighbors through an access link to a backbone network. We assume that the network is heavily loaded i.e., every peer has sufficient number of pending download requests, and hence these peers are contending for the available transmission capacity. We also assume that every peer is paying the cost of access link as per the use (for both download and upload as per the common billing practice of most of the service providers). Downloaded data is more valuable than the cost of access link. Moreover, we assume that data that is of interest to peer is always available. So, every peer wants to maximize its downloads and minimize its uploads so that it can get maximum utility of its expenditure. This Optimization leads to problem of free riding.

Aggregation of Trust:
Whenever a node needs a resource, it asks from its neighbors; if they have the resource, the node gets the answer of its query. If neighbors do not have it, they forward the query to their neighbors and so on. The node that has the resource, replies back to the requesting node. The requesting node now asks for the resource from this node. The answering node directly provides the resource according to the reputation of the requester. If a node receives a request from a non neighbor another node, the reputation of requesting node needs to be estimated somehow in order to decide the quality of service to be provided. If two nodes are going to transact for the first time they should have reputation of each other. This can be done by getting the reputation of the node from existing neighbors and then using it to make an initial estimate. When for a node, multiple trust values are received, we need an aggregation mechanism to get the single trust value. Trust value should always lie in between zero and one, zero means no trust and one means complete trust.
Differential Gossip Trust:

We have modified the gossip based information diffusion algorithm to allow faster diffusion of the trust values enabling faster estimation of global trust vectors at all the nodes. The algorithm can be divided into two parts. In first part, we will discuss about the method of information diffusion whereas in the second part, we will discuss about the information that is to be diffused.

Differential Reputation Algorithm:
Unstructured peer-to-peer network are very similar to human social networks, the former can be mimicked as the latter. In human network, when we need the reputation value of somebody, we rely on personal experience with him. If we don't have any prior personal experience, we rely on the combination of two things: First, the general perception about him which we receive from gossip flowing around. Second, the weighted average of information given by our friends if they have any direct interaction with him where weights to information are given according to degree of friendship. Based on this, we propose a new algorithm as follows. In this algorithm the nodes gather opinion of their neighbors and combine it with the opinion, obtained from general gossip after weighing the neighbor's opinion or direct feedback according to the confidence in the neighbors. In general, it can be said that a node gives weight to every node in the network.

SCREEN SHOTS:

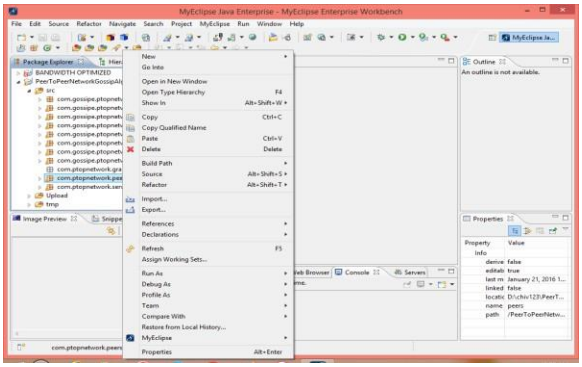

Fig: Open the peer server

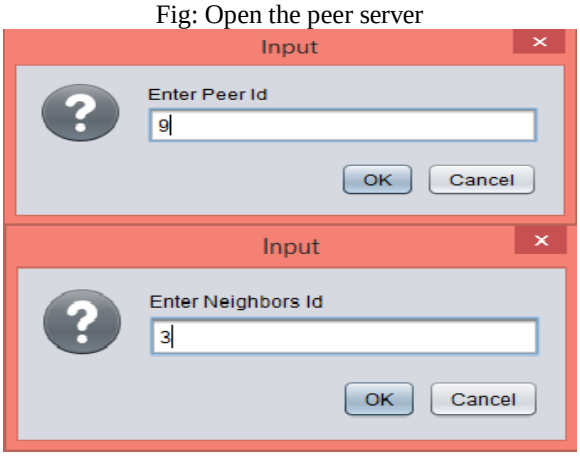

Fig: Enter the peer id and neighbors id

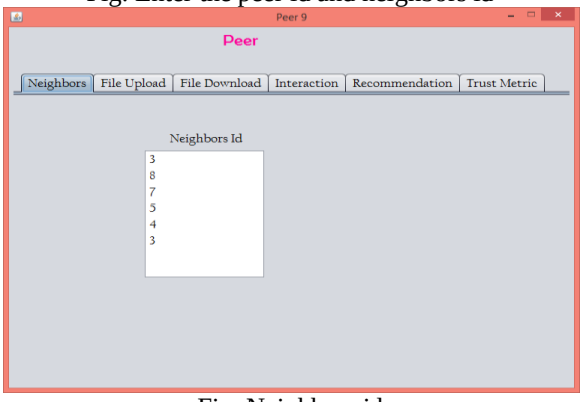

Fig: Neighbors id

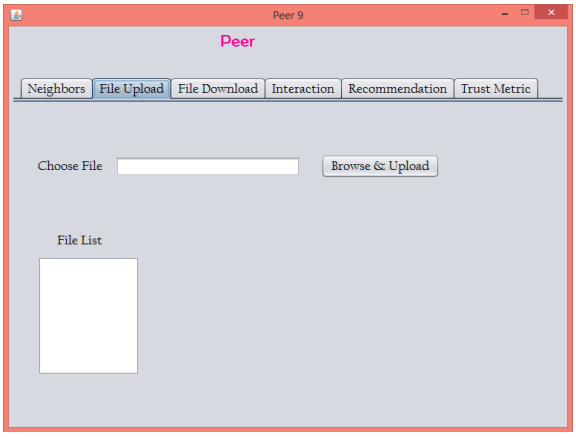

Fig: File Upload

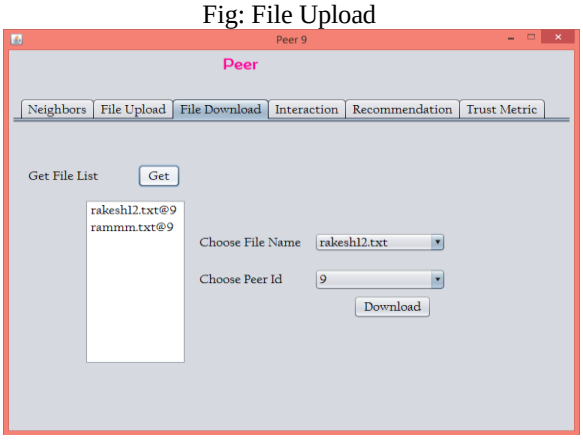

Fig: File download

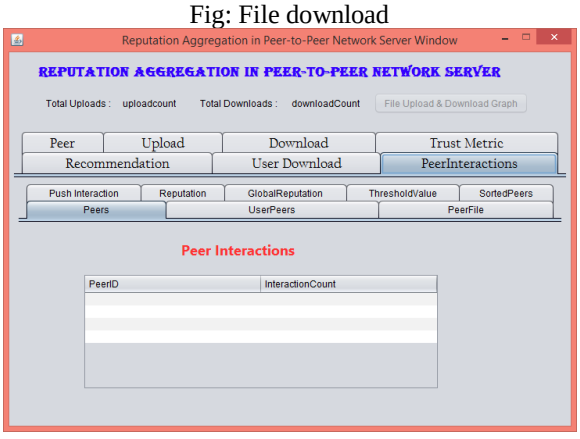

Fig: Peer interactions

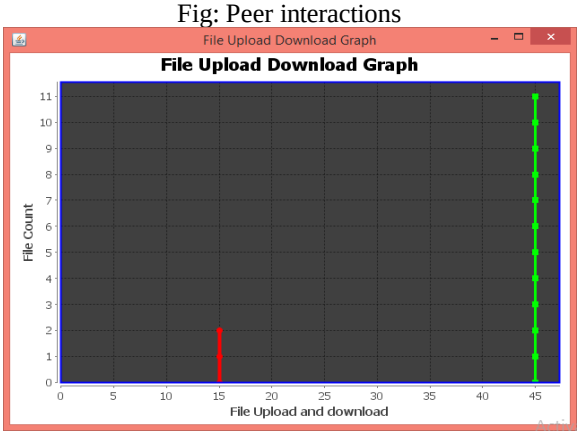

Fig: File Upload and Download Graph

4. CONCLUSION

These focused on transport protocols in cognitive radio network which select a channel from a wide spectrum range. We then examined how the transport protocol and the relay node should be redesigned to make an efficient use of available wireless resource. In peer-to-peer networks, free riding is a major problem that can be overcome by using the reputation management system. A reputation management system includes two processes, First estimation of reputation and second aggregation of reputation. In this process we have proposed an aggregation technique for power law networks by modifying the push gossip algorithm to differential push gossip algorithm. The proposed aggregation technique efficiently aggregates the trust values from different nodes in a power law network. This technique does not require the identification of power nodes. This makes algorithm easily implement as identification of power nodes in a distributed setting is hard. The suggested technique aggregates the reputation in a differential manner. This is done by considering the feedback of trusted nodes with a higher weight. This leads to robustness against collusion. Proposed algorithm has been presented to avoid the problem of free riding but it can also be used to avoid malicious users in the network just by changing the method of the estimation of ai and bij.

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