

A New Model for Address Discovery in P2P and F2F Networks¹

Mohammed B. M. Kamel ^{a,b}, Péter Ligeti ^a, Ádám Nagy ^a

^a Department of Computeralgebra, Faculty of Informatics, Eötvös Loránd University, Hungary

^b Department of Computer Science, University of Kufa, Iraq

mkamel@inf.elte.hu, turul@cs.elte.hu, spigy88@inf.elte.hu

Because of sophisticated components of mobile equipment, mobile devices have become important tools to sense, communicate, and compute data. Peer-to-peer (P2P) network is a decentralized network in which each peer acts as both client and server, which make it more applicable on emerging systems that consist mostly of mobile nodes. One example for decentralized systems is RetroShare [1]. P2P networks are widely used in different applications such as secure chat and distributed file sharing. The systems such as Siren [2], uses a private type of P2P networks called friend-to-friend (F2F) networks as their underlying communication scheme to ensure secrecy and anonymity of participants beyond direct peer nodes [3]. Lookup latency is one of the main problems of such systems that uses Distributed hash tables (DHT) [4] which leads to some technical and operational problem.

In this paper, we propose a new model for address discovery in order to solve the above mentioned issue of existing systems. The model allows each node to maintain the addresses in a distributed way and explore the current up-to-date address of its peer friends in order to establish a direct connection using socket technology without any centralized scheme. The address discovery process has to be reliable, secure and fast. We assume honest behaviour from the participants of the F2F network, and semi-honest behaviour of the P2P nodes.

References

- [1] RetroShare: secure communications with friends available online at <http://retroshare.sourceforge.net/>
- [2] Kasza, P., Ligeti, P. and Nagy, A., 2015. Siren: Secure data sharing over P2P and F2F networks. *Studia Scientiarum Mathematicarum Hungarica*, **52** (2), pp. 257-264.
- [3] Isdal, T., Piatek, M., Krishnamurthy, A. and Anderson, T., 2010, August. Privacy-preserving p2p data sharing with oneswarm. In *ACM SIGCOMM Computer Communication Review*, **40** (4) pp. 111-122.
- [4] Balakrishnan, H., Kaashoek, M.F., Karger, D., Morris, R. and Stoica, I., 2003. Looking up data in P2P systems. *Communications of the ACM*, **46** (2), pp. 43-48.

¹This research has been partially supported by the ÚNKP-17-4 National Excellence Program of the Ministry of Human Capacities and Stipendium Hungaricum Scholarship Programme.