Developing Efficient Search Algorithms for P2P Networks Using Proliferation and Mutation?

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Abstract. Decentralized peer to peer networks like Gnutella are attractive for certain applications because they require no centralized directories and no precise control over network topology or data placement. The greatest advantage is the robustness provided by them. However, flooding-based query algorithms used by the networks produce enormous amounts of traffic and substantially slow down the system. Recently flooding has been replaced by more efficient k-random walkers and different variants of such algorithms [5]. In this paper, we report immune-inspired algorithms for searching peer to peer networks. The algorithms use the immune-inspired mechanism of affinity-governed proliferation and mutation to spread query message packets in the network. Through a series of experiments, on different types of topologies, we compare proliferation/ mutation with different variants of random walk algorithms. The detailed experimental results show message packets undergoing proliferation and mutation spread much faster in the network and consequently proliferation/mutation algorithms produce better search output in p2p networks than random walk algorithms.