

Special Issue on Advances in P2P Technology

Guest Editorial

Peer-to-peer (P2P) networks have recently received tremendous attention due to their inherent scalability and flexibility. These systems have emerged as the dominant consumer of residential Internet subscribers' bandwidth, and are being increasingly used in many different application domains. In the last few years, research on P2P systems has been quite intensive, and has produced remarkable results in scalability, robustness, location, distributed storage, and system measurements. Recently, interesting applications of P2P technology have begun to emerge, together with new platforms for application development. This special issue includes five papers selected after peer review process. A summary of papers is as follows.

“Complex Queries in P2P Networks with Resource-Constrained Devices” by Christian Dannewitz, Thorsten Biermann, Martin Draxler, and Holger Karl, presents a distributed search mechanism that efficiently supports multi-attribute queries and multi-dimensional range queries on resource-constrained devices. The scheme introduces an adjustable trade-off between search latency and resource requirements. The proposed approach significantly reduces the memory footprint and bandwidth requirements. A dynamic replication scheme which introduces an adjustable trade-off between memory footprint and search latency helps to provide the good latency properties and the low messaging overhead.

“PM4SWS: A P2P Model for Semantic Web Services Discovery and Composition” by Mohamed Gharzouli and Mahmoud Boufaïda proposes an unstructured P2P Model for semantic web service discovery and composition. The paper also presents a distributed framework to offer a collaborative workspace between a whole of peers where each peer can offer their Web services and can exploit the resources of other peers.

“Using Materialized Views to Enhance a Traceable P2P Record Exchange Framework” by Fengrong Li and Yoshiharu Ishikawa focuses on how to enhance the traceable P2P record exchange framework using materialized views. The mechanism to construct materialized views is discussed. Various methods for reducing query processing cost and providing fault tolerance using the materialized views are also presented. Several further issues for future research are finally discussed.

“Load Balancing in P2P Networks: Using Statistics to Fight Data and Execution Skew” by Daniel Warneke and Christian Dannewitz introduces a load balancing algorithm for structured P2P networks based on ID management. The proposed scheme observes message flows during regular network operations and uses the collected statistics to direct joining peers towards highly-frequented regions of the ID space.

“An ACO Algorithm for Effective Cluster Head Selection” by Amritha Sampath, Tripti. C, and S. M. Thampi presents an algorithm for selecting cluster heads in mobile ad hoc networks using ant colony optimization. The algorithm is a combination of the four main clustering schemes- the ID based clustering, connectivity based, probability based and the weighted approach. The ACO algorithm succeeded for finding out minimum number of cluster heads in the network.

Guest Editor

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