Topic 15
Peer-to-Peer and Web Computing

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Topic Chairs

Peer-to-peer (P2P) systems have become a major area of research in the past few years. Their potential was first revealed by the hugely popular P2P file sharing applications, which allow any computer (as a peer), anywhere in a large scale distributed computing environment, to share information and resources with others. The computing environments promoted by P2P systems and technology are decentralized in nature, exploring a symmetric pairwise interaction model. They are self- organized and self-coordinated, dynamically adapted to peer arrivals and departures, and highly resilient to failures. As P2P research becomes more mature, new challenges emerge to support complex and heterogeneous distributed environments for sharing and managing data, resources, and knowledge, with highly volatile and dynamic usage patterns. This topic provides a forum for researchers to present new contributions on P2P technologies, applications, and systems, identifying key research issues and new challenges.

Eleven papers were submitted to this topic and four were accepted. These papers address various aspects of P2P overlays and search protocols. In *"Top k RDF Query Evaluation"*, the authors describe a P2P backtracking search strategy for finding the largest k values in large RDF databases. The second paper, *"Roogle: Supporting Efficient High-Dimensional Range Queries in P2P Systems"*, presents a mechanism to index data in a distributed hash table (DHT) and look it up using high-dimensional queries. In *"Creating and Maintaining Replicas in Unstructured Peer-to- peer Systems"*, the authors describe an approach for optimal replication of data in unstructured P2P systems based on square-root replication. Finally, *"DOH: A Content Delivery Peer-to-Peer Network"* presents a scalable content distribution scheme for Web sites, which involves a load balancing component and a content retrieval mechanism based on DHT lookup and caching.