Topic 18
Peer-to-Peer and Web Computing

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Topic Chairs

Peer-to-peer computing has evolved recently from an attractive new paradigm into an exciting and vibrant research field bringing together researchers from distributed systems, networks and theory. Peer-to-peer systems are characterized as being decentralized, self-organizing distributed systems, in which all or most communication is symmetric. Peer-to-peer technologies are aimed for building large-scale distributed services. In particular peer-to-peer architectures could be used in the context of web and grid computing to provide scalable self-organizing resources/services. Because of their size, autonomy and possibly high volatility, peer-to-peer systems provide the opportunity for researchers to re-evaluate many fields of distributed computing, such as protocols, infrastructures, security, certification, fault tolerance, scheduling, performance analysis, etc.

This topic examines peer-to-peer technologies, applications, and systems, and also identifies key research issues and challenges. 19 papers were submitted, seven has been accepted as regular papers, and one as short. Here comes a short description of the accepted papers.

In "A P2P Grid Services-Based Protocol: Design and Evaluation" the authors propose to use the Gnutella-protocol for discovering grid-peers and implement an OGSA-compliant grid service for the Gnutella protocol. In "A Small World Overlay Network for Resource Discovery" the authors suggest that every peer in the system describe its resources in a XML document. A distance function is defined which takes two XML documents and returns the complement of the ratio of matches between the documents. In "A Hybrid Peer-to-Peer Network Solution to the Synchronization and Session Control in 3D Multi-User Virtual Environments" the paper is describing an alternative to a centralized maintenance of a distributed 3D environment using the Gnutella network. In "TAP: Topology-Aware Peer-to-Peer Network with Expanding-Area Lookup" the authors propose a combination of DHT mechanism with a small hierarchical structure (4 levels are proposed) to handle the locality problem in Distributed Hash Table overlay networks. In "Improving the Scalability of Logarithmic-Degree DHT-based Peer-to-Peer Networks" the authors propose an improvement of the network size for given routing-table size of logarithmically structured P2P DHT-based networks. In "The *ncast* Primitive for Peer-to-Peer Networks" the paper proposes a communication primitive similar to a multicast operation, where only the number of delivered messages is specified. The paper "Going Large-scale in P2P Experiments Using the JXTA Distributed Framework" basically presents a case study of a framework for distributed applications based on JXTA which is a middleware for building peer-to-peer applications. Finally "Using Similarity Groups to Increase Performance of P2P Computing" is about the design of new strategies based on various concepts of similarity that can be used to group together peers in a Peer-to-peer network.