

# P2PS: a Peer-to-Peer Middleware

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Although the current Grid systems have solutions for problems like resource negotiation and distributed job scheduling, there is still a need for ongoing work to make the Grid systems scalable and dependable. To this end, the peer-to-peer (P2P) systems can play a main role by implementing network infrastructures with scalability and availability properties.

The P2P systems have received a paramount attention mostly due to their attractive features such as self-organization and decentralization. Providing the programmer with the “right” platform for developing decentralized became a challenge. In this talk we will describe the functionality of P2PS, a middleware for developing P2P applications. The P2PS middleware provides the developer with a means for building and working with P2P overlay applications, offering various primitives and services such as group communication, efficient data location, and dealing with highly dynamic networks. P2PS implements Tango [1], an efficient algorithm for constructing structured P2P systems.

The main functionality provided by P2PS can be summarized as follows: network management primitives such as create, join and leave a network, communication primitives such as one-to-one, broadcast and multicast, and monitoring primitives. With P2PS we intend to provide basic P2P primitives on top of which more specialized services will be built. For instance, dictionary functionality such as looking for the responsible of a key can be immediately implemented by using the communication primitives offered by the P2PS library.

The P2PS library was made public [2], and is already being used as underlying structure for different P2P applications. Furthermore, we have undergoing research to extend the functionality of P2PS, e.g., to deal with node and network heterogeneity, provide support for transactional objects.

## References

- [1] Carton, B., Mesaros, V.: Improving the Scalability of Logarithmic-Degree DHT-based Peer-to-Peer Networks. Euro-Par (2004)
- [2] UC Louvain, and CETIC, Belgium: P2PS: Peer-to-Peer System Library (2003)  
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