

Systems Support For Efficient State-Machine Replication

Gerhard Habiger and Franz J. Hauck, Universität Ulm

State Machine Replication is a well known approach for the deployment of highly fault-tolerant services. Recent research has focused on efficiency improvements, performance optimization and novel approaches to underlying concepts of SMR, such as consensus with trusted components, dynamic weights for quorums, or parallelization of application code. To increase adoption of SMR as a basic fault-tolerance technique, we see the need to improve the current state of the art of SMR even further, and provide four specific ways in which our research contributes to this goal. In particular, we present two approaches which make the development and deployment of SMR services both easier and more efficient, and talk about two further areas of improvement concerning internal mechanisms of common SMR architectures. The goal of this paper is to provide our current understanding of important issues of current SMR systems as well as to outline possible future solutions to them.