Reconfigurable lattice agreement and applications. (English) Zbl 1504.68017


Summary: Reconfiguration is one of the central mechanisms in distributed systems. Due to failures and connectivity disruptions, the very set of service replicas (or servers) and their roles in the computation may have to be reconfigured over time. To provide the desired level of consistency and availability to applications running on top of these servers, the clients of the service should be able to reach some form of agreement on the system configuration. We observe that this agreement is naturally captured via a lattice partial order on the system states. We propose an asynchronous implementation of reconfigurable lattice agreement that implies elegant reconfigurable versions of a large class of lattice abstract data types, such as max-registers and conflict detectors, as well as popular distributed programming abstractions, such as atomic snapshot and commit-adopt.

For the entire collection see Zbl 1434.68024.

MSC:

68M14  Distributed systems
68N19  Other programming paradigms (object-oriented, sequential, concurrent, automatic, etc.)
68Q65  Abstract data types; algebraic specification

Keywords:
reconfigurable services; lattice agreement

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