

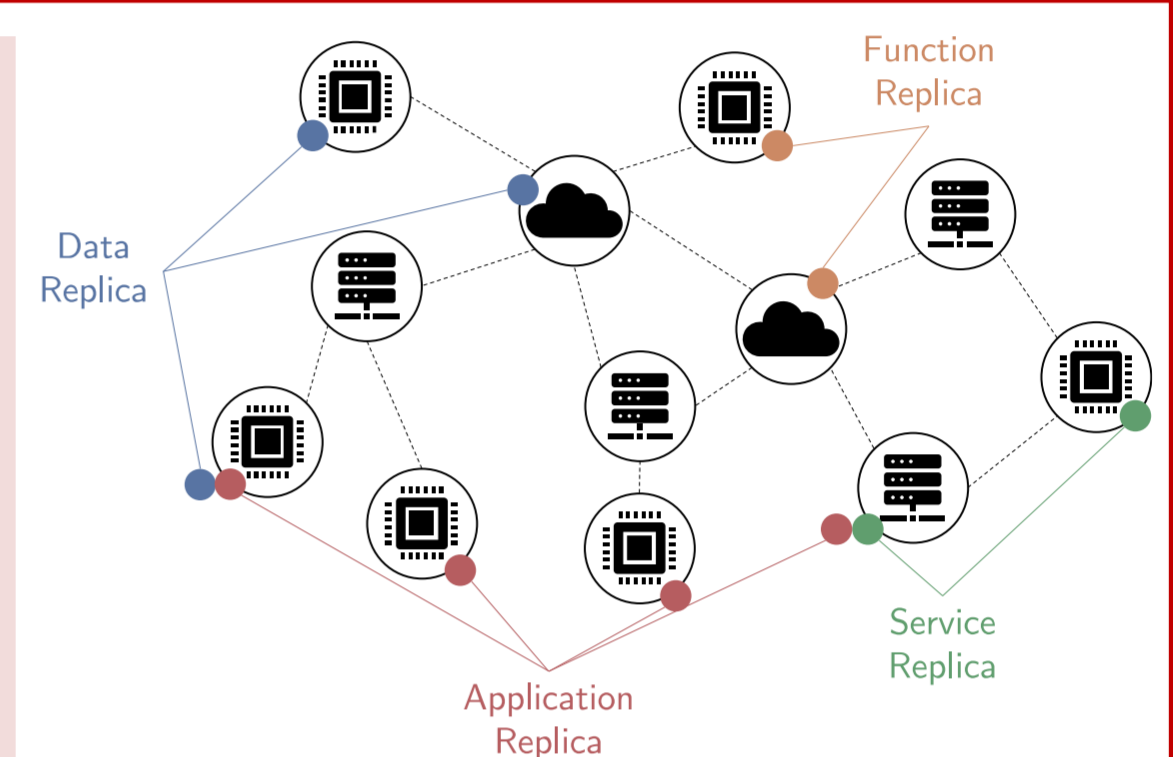
Towards Distributed Coordination for Fog Platforms

Tobias Pfandzelter, Trever Schirmer, David Bermbach
TU Berlin & ECDF, Germany
Mobile Cloud Computing Research Group
{tp,ts,db}@mcc.tu-berlin.de

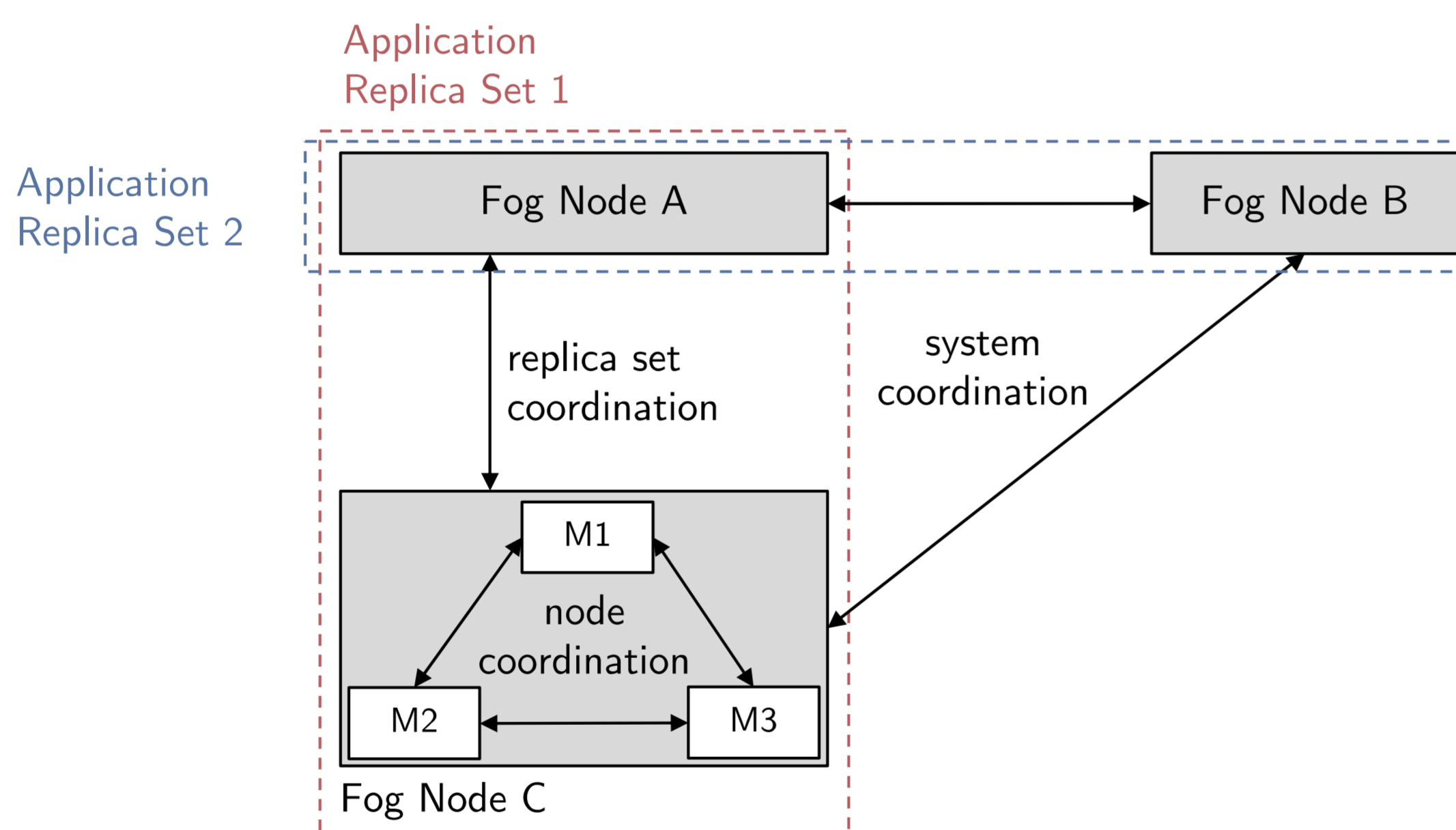
CHALLENGE

Distributed fog/edge applications are subject to **unreliable communication** and high **communication delay**, making coordination among components difficult. Two factors influence this:

1. *How* is coordination state exchanged?
2. *Who* participates in update exchanges?



DISTRIBUTED CONFIGURATION



Approach: Let developers specify *coordination strategy* and *participants* per type of coordination.

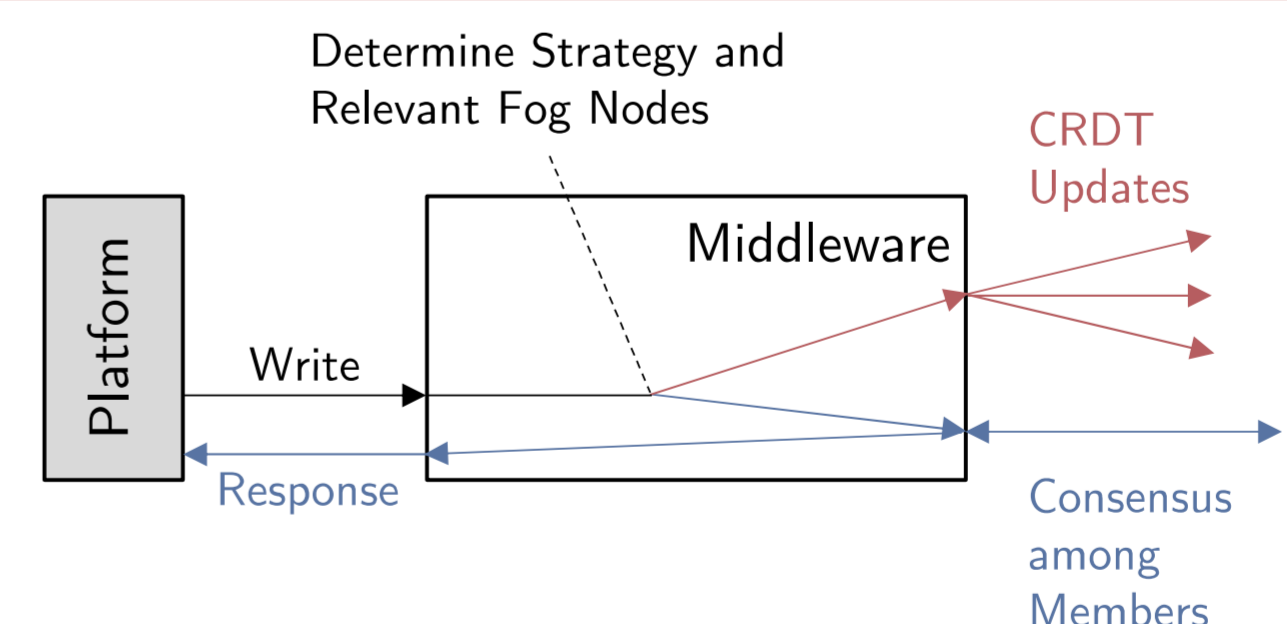
Coordination Levels:

1. System Coordination
2. Replica Set Coordination
3. Node Coordination

Coordination Strategy:

1. Eventual Consistency with CRDTs
2. Strict Consistency with Consensus

Approach may be implemented using a middleware.



FUTURE WORK

- Implementation and evaluation of the middleware
- Evaluate impact of consistency tuning on correctness and performance of different fog platforms
- Extend middleware for further strategies
- CRDT update message deduplication in the overlay network
- Infer coordination strategies and levels from data access