Proceedings of the First Workshop on the Principles and Practice of Consistency for Distributed Data

PaPoC 2015

April 21, 2015

Bordeaux, France

# Preface

Consistency is one of the fundamental issues of distributed computing. There are many competing consistency models, with subtly different power in principle. In practice, the well-known Consistency-Availability-Partition Tolerance trade-off translates to difficult choices between fault tolerance, performance, and programmability. The issues and trade-offs are particularly vexing at scale, with a large number of processes or a large shared database, and in the presence of high latency and failure-prone networks. It is clear that there is no one universally best solution. Possible approaches cover the whole spectrum between strong and eventual consistency. Strong consistency (total ordering via, for example, linearizability or serializability) provides familiar and intuitive semantics but requires slow and fragile synchronization and coordination overheads. The unlimited parallelism allowed by weaker models such as eventual consistency promises high performance, but divergence and conflicts make it difficult to ensure useful application invariants, and meta-data is hard to keep in check. The research and development communities are actively exploring intermediate models (replicated data types, monotonic programming, CRDTs, LVars, causal consistency, red-blue consistency, invariant- and proof-based systems, etc.), designed to improve efficiency, programmability, and overall operation without negatively impacting scalability.

This workshop aims to investigate the principles and practice of weak consistency models for large-scale, distributed shared data systems. It brings together theoreticians and practitioners from different horizons: system development, distributed algorithms, concurrency, fault tolerance, databases, language and verification, including both academia and industry.

PaPoC is the direct successor of the EuroSys 2014 Workshop on Principles and Practice of Eventual Consistency. The concept of this workshop sprang from several sources, including the 2013 Dagstuhl workshop on “Consistency in Distributed Systems”, the ANR Project ConcoRDanT <http://concordant.lip6.fr/>, and the EU FP7 project SyncFree <https://syncfree.lip6.fr/>.

We wish to thank our keynote speakers for their contribution to the program: Marcos Aguilera, (VMware Inc., USA) and Peter Bourgon, (SoundCloud, Germany).

April 2015 Marco Serafini and Carlos Baquero *Program Chairs*

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*\*\*: The authors did not opt to include their paper in these proceedings.*