NoSQL databases have been initially designed to provide extreme scalability and availability for Internet applications, often at the expense of data consistency. The recent generation of Web-scale databases fills this gap, by offering transaction support. However, transaction processing implies a performance overhead that is redundant for many applications that do not require strong consistency. The solutions offered by state-of-the-art technologies, either static separation of the data accessed by transaction-enabled and native applications, or transforming all native operations into transactions in the latter, are both inadequate. We present a novel scalable transaction processing system, Mediator, that accommodates both transactional and native operations in the same database without compromising data safety. Our work introduces a lightweight synchronization protocol that enables conflict resolution between transactions and native operations that share the same data. We evaluate Mediator’s implementation on top of the HBase NoSQL database on a large-scale distributed testbed. Our results show that despite a slight overhead to the transactional traffic, Mediator substantially outperforms the best-in-class traditional system on a vast majority of mixed workloads – in particular, on all workloads in which the fraction of native operations exceeds 50%.

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12:00-13:00 on Tuesday, 25 June, 2013—Saal Auditorium, Alon Bldg (37/202) 12:00-13:00