The two areas of online transaction processing (OLTP) and online analytical processing (OLAP) present different challenges for database architectures. Currently, customers with high rates of mission-critical transactions have split their data into two separate systems, one database for OLTP and one so-called data warehouse for OLAP. While allowing for decent transaction rates, this separation has many disadvantages including data freshness issues due to the delay caused by only periodically initiating the Extract Transform Load-data staging and excessive resource consumption due to maintaining two separate information systems. We present an efficient hybrid system, called HyPer, that can handle both OLTP and OLAP simultaneously by using hardware-assisted replication mechanisms to maintain consistent snapshots of the transactional data. HyPer is a main-memory database system that guarantees the ACID properties of OLTP transactions and executes OLAP query sessions (multiple queries) on the same, arbitrarily current and consistent snapshot. The utilization of the processor-inherent support for virtual memory management (address translation, caching, copy on update) yields both at the same time: unprecedented high transaction rates as high as several 100000 per second and ultra-low OLAP query response times of as low as 10 ms on all on a commodity desktop server. Even the creation of a fresh, transaction-consistent snapshot can be achieved in 10 ms.