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Efficient Replication and Fault-tolerance

Key-words: Systems, Replication, Fault-tolerance, Efficiency, In-memory, Stream Storage
Ph.D research summary

Replication is expensive in in-memory systems
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Why?
Network, CPU, ...

E.g. RAMCloud, FaRM, Redis

ICDCS'17
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It could benefit from RDMA
But… unsafe!
Tailwind guarantees atomicity
A new stream-partitioning scheme -> **Scale**-up/down
Fine grain -> better **throughput**
Co-locating stream processing and storage (kv-store)
KerA is durable and guarantees Exactly-once!

Crash? Needs 2 RTTs to resume service

Early results: **5X** better throughput than Kafka (Producers/Consumers)  
**10X** with Kernel-bypass