

Fine-grained transaction scheduling

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DISCLAIMER

This is still a work in progress

The information contained in this presentation is subject to change and may not represent the final product

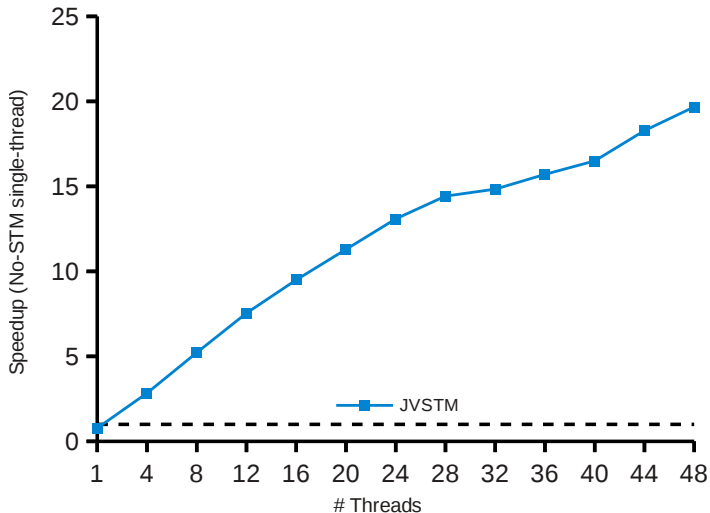
Previously on...



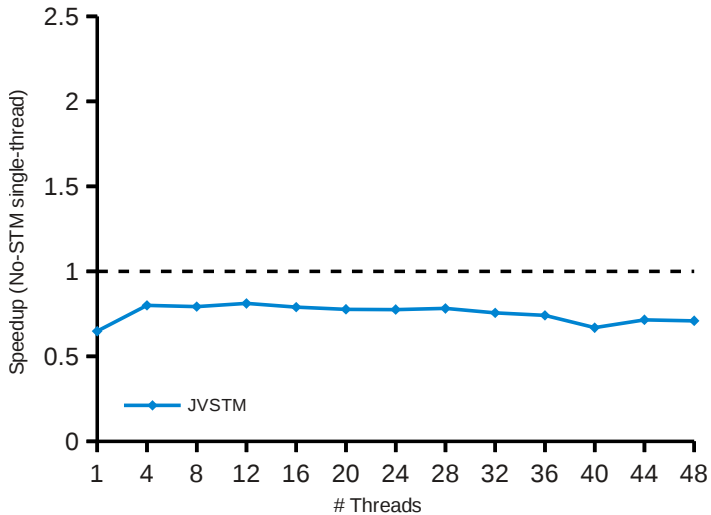
Software Transactional Memory



STMBench7: 10% Writes + Small transactions



STMBench7: 10% Writes + Long transactions



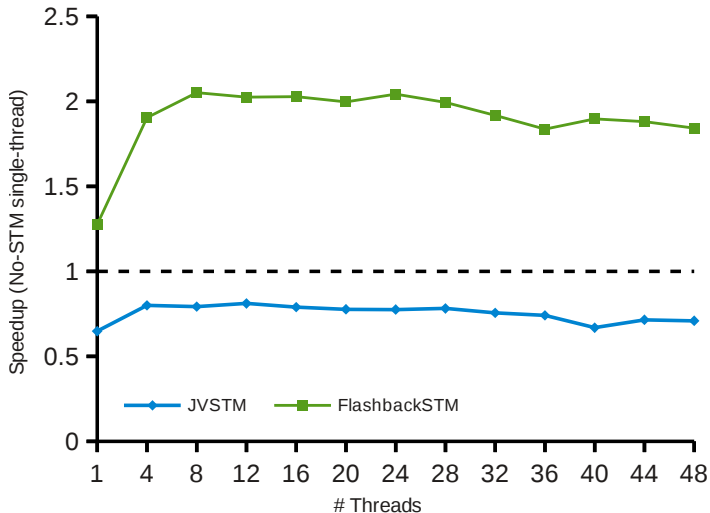
Green STM



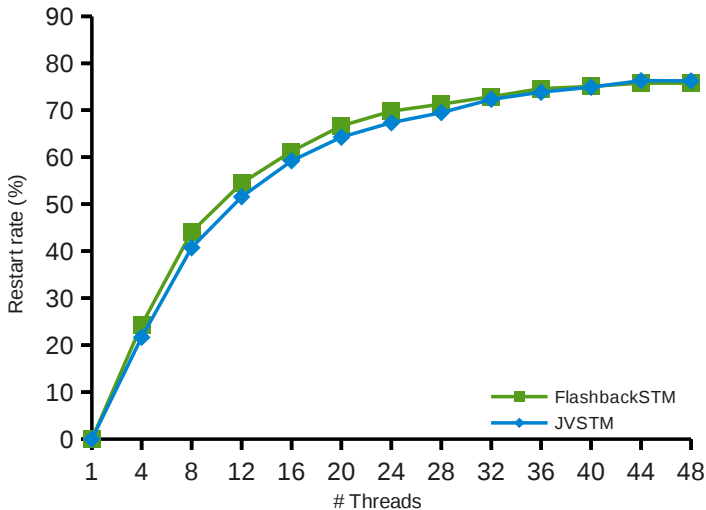
FlashbackSTM



STMBench7: Read-dominated + Long transactions



STMBench7: Read-dominated + Long transactions



And now the continuation...

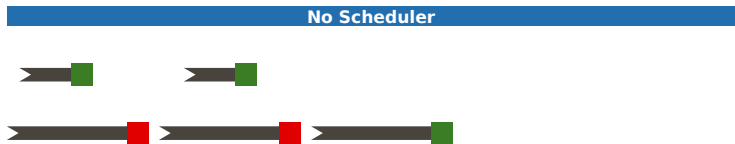


Scheduling

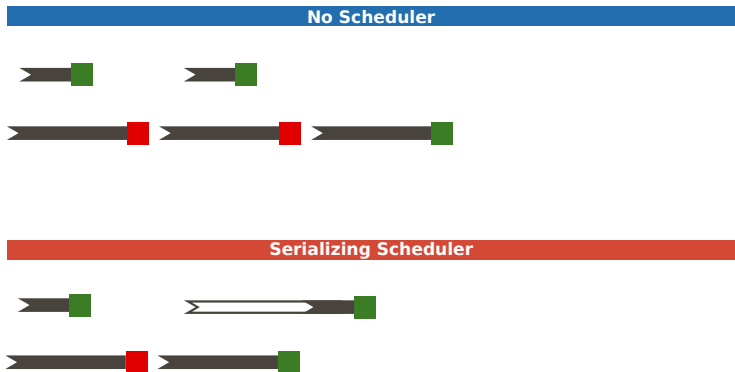
Reduce Conflicts

- Monitor contention
- Serialize transactions

Scheduling



Scheduling



Related work

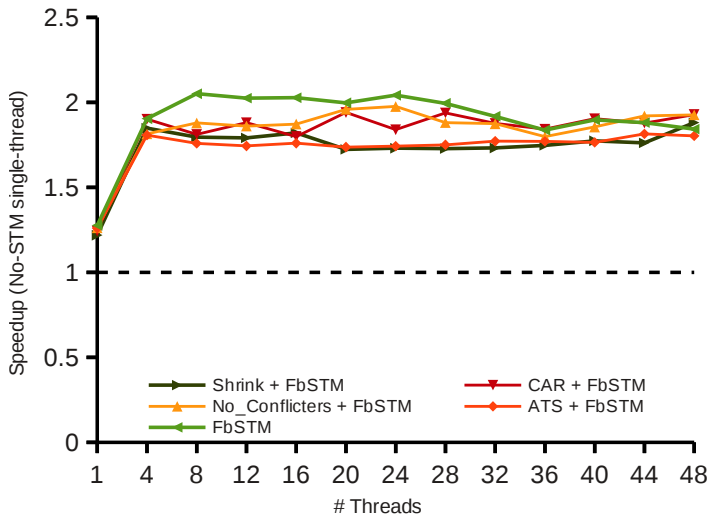


FlashbackSTM

FlashbackSTM

- JVSTM + Memo
- RO never conflict
- RW conflicts vs. already committed
- Early aborts

FlashbackSTM + Scheduling

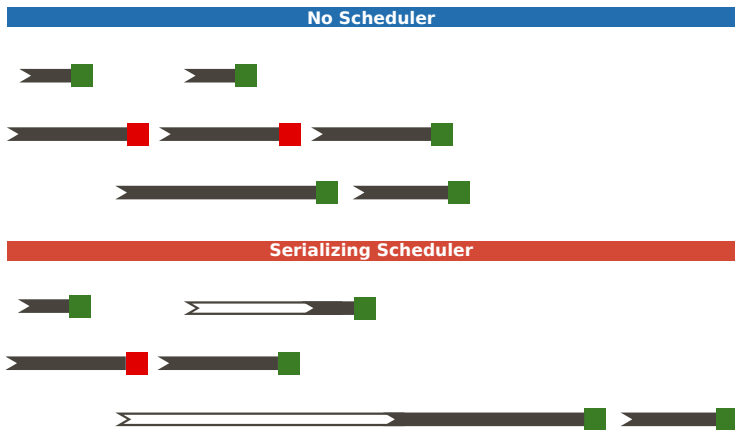


FlashbackSTM + Scheduling

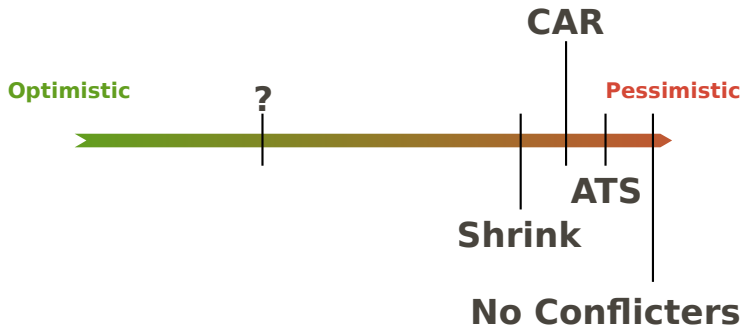
Over serialization

- Serialize non-conflicting transactions
- Hinders parallelism

FlashbackSTM + Scheduling



FlashbackSTM + Scheduling

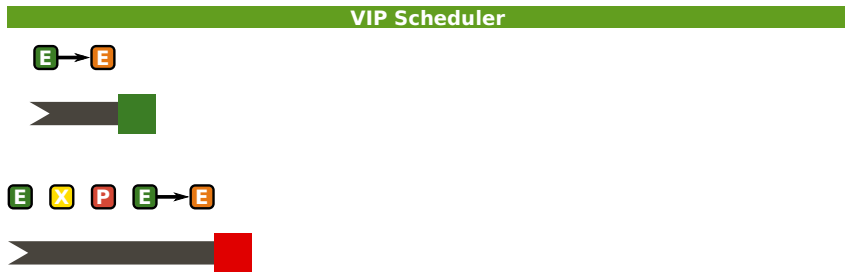


VIP scheduler

VIP Scheduler

- Optimistic (more)
- Fine-grained
- VIP transactions

VIP execution



VIPs →

VIP execution

VIP Scheduler

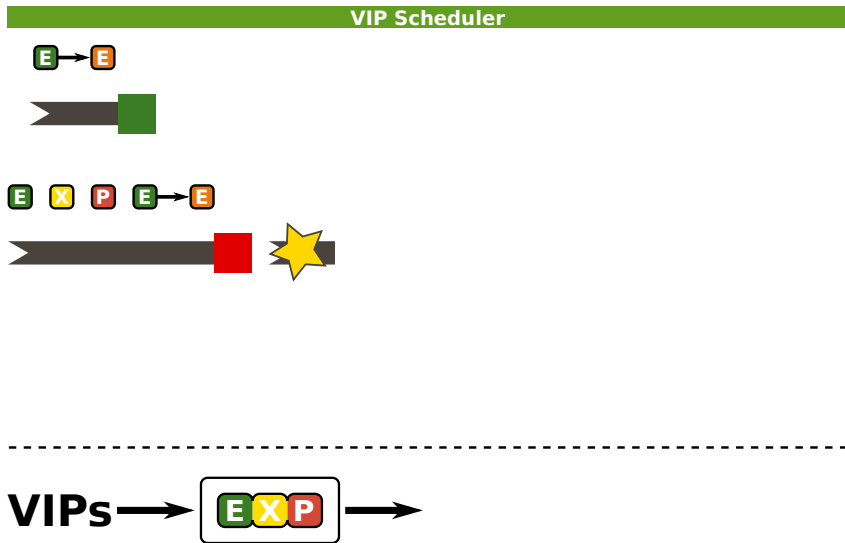
E → E



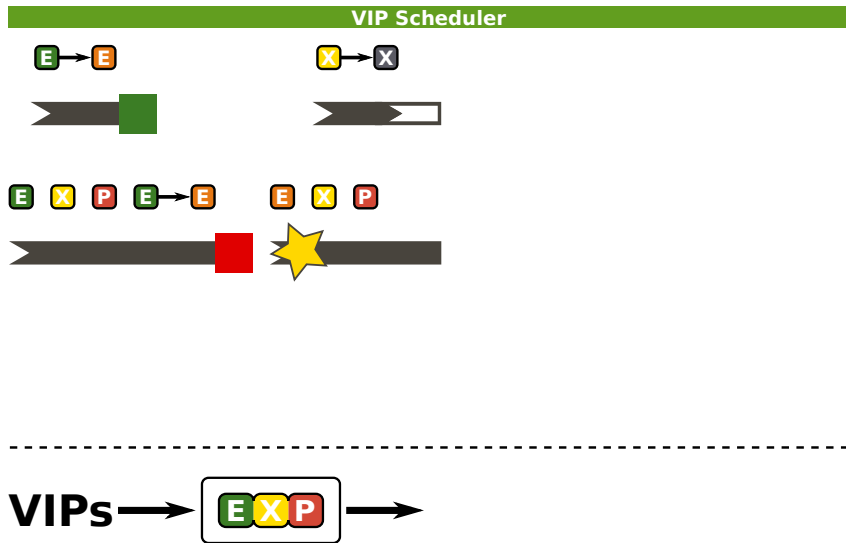
E X P E → E



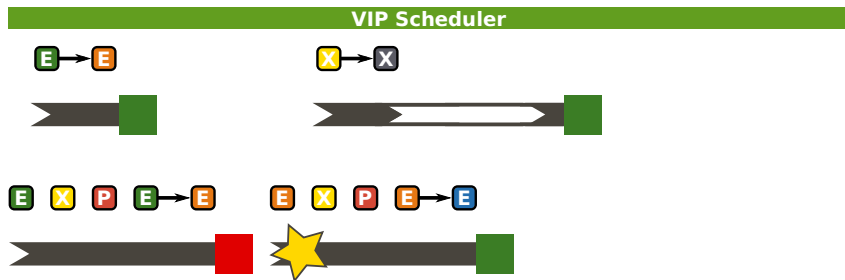
VIP execution



VIP execution

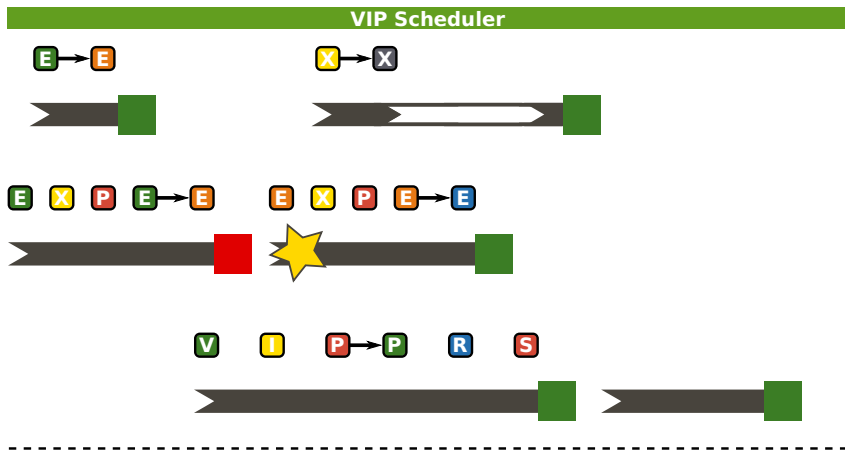


VIP execution



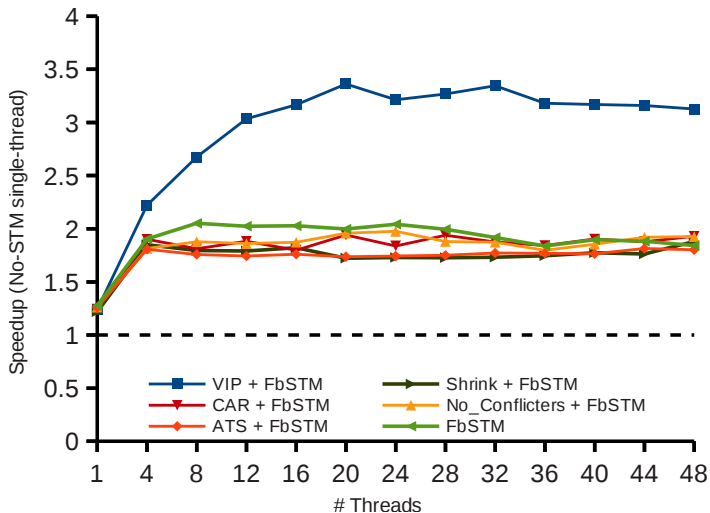
VIPs →

VIP execution

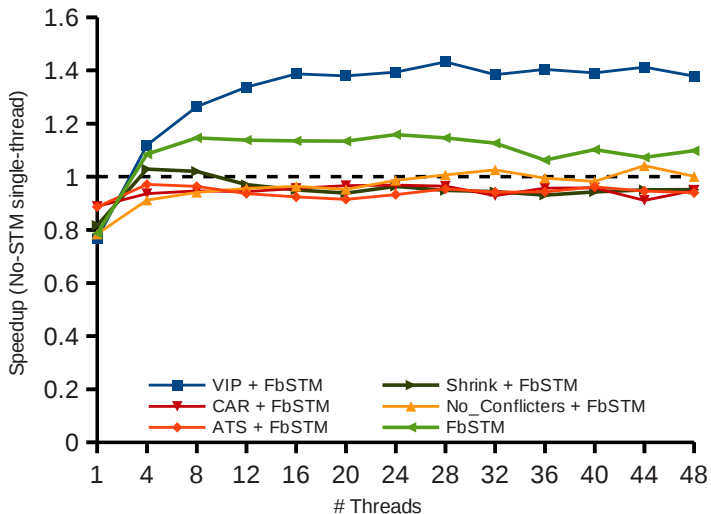


VIPs →

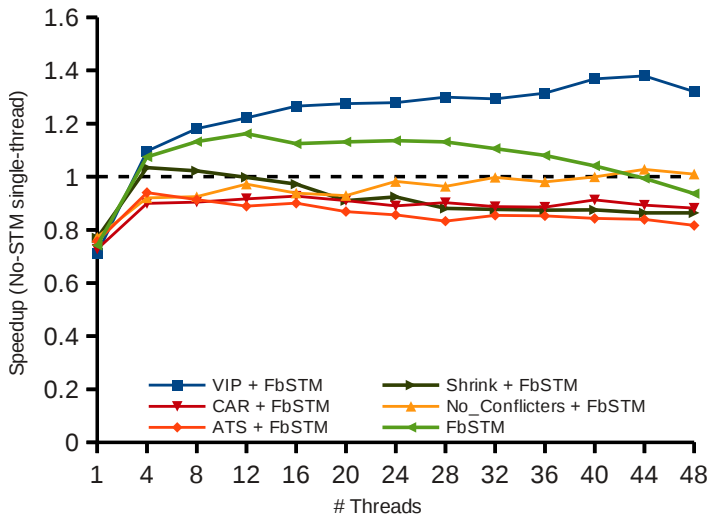
STMBench7: 10% Writes + Long transactions



STMBench7: 40% Writes + Long transactions

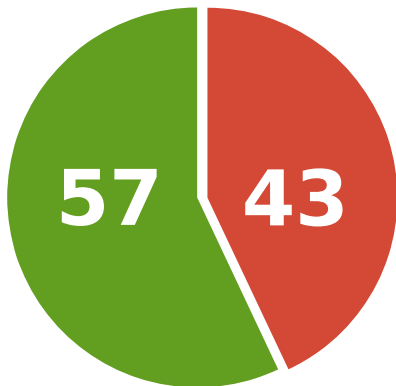


STMBench7: 90% Writes + Long transactions



Challenges: Thread inactivity

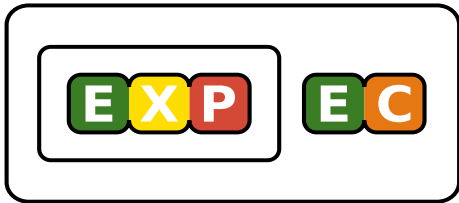
Execution vs. Wait time



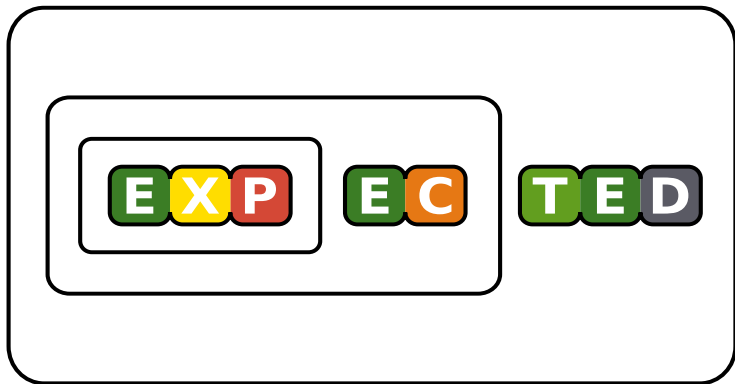
Challenges: Early aborts + Expected read-set



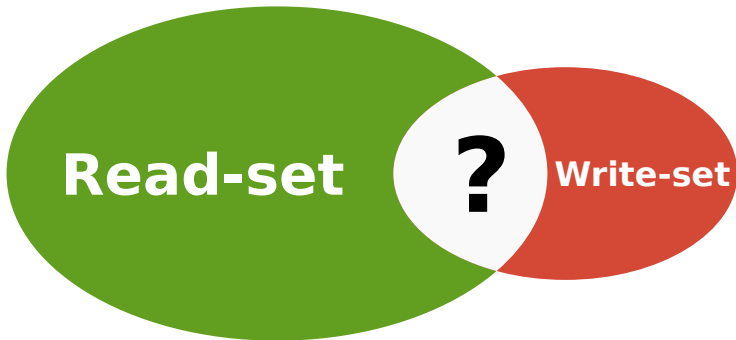
Challenges: Early aborts + Expected read-set



Challenges: Early aborts + Expected read-set



Challenges: Set intersection



Thank you,

Q U E S T I O N S