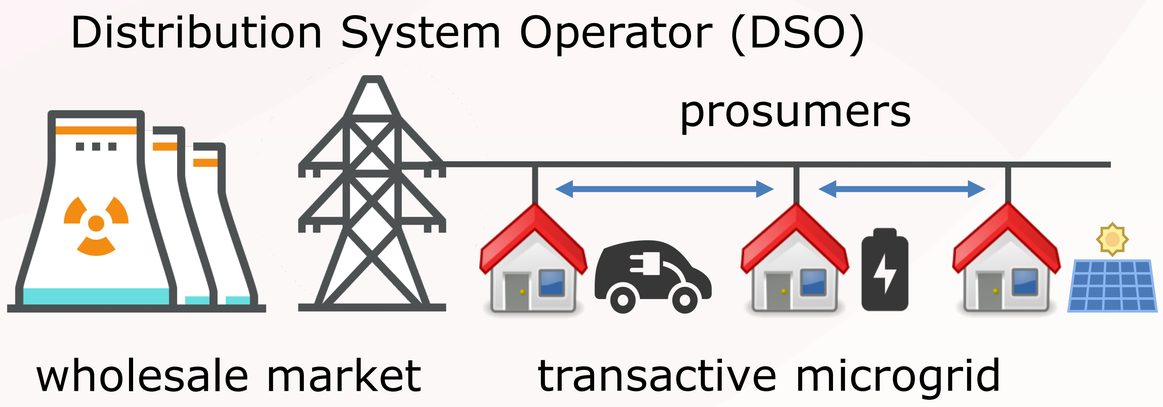
Privacy-Preserving Energy Transactions (PETra): Providing Privacy, Safety, and Security in IoT-Based Transactive Microgrids using Blockchains

Aron Laszka, Karla Kvaternik, Michael Walker, Abhishek Dubey

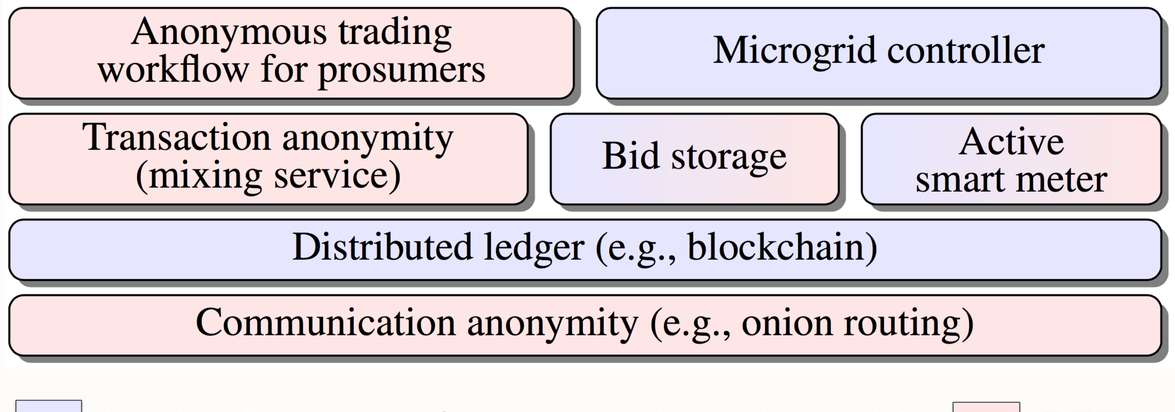
Overview

- Power grids are undergoing major changes due to rapid growth in **renewable energy** and improvements in **battery technology**
- Prompted by the increasing complexity of power systems, **decentralized IoT** solutions are emerging, which arrange local communities into **transactive microgrids**
- However, providing security, safety, and privacy in such energy systems is challenging
- We introduce **PETra**, a blockchain-based solution that enables consumers to trade energy without sacrificing their **privacy** and provides **safety** and **security** for the grid

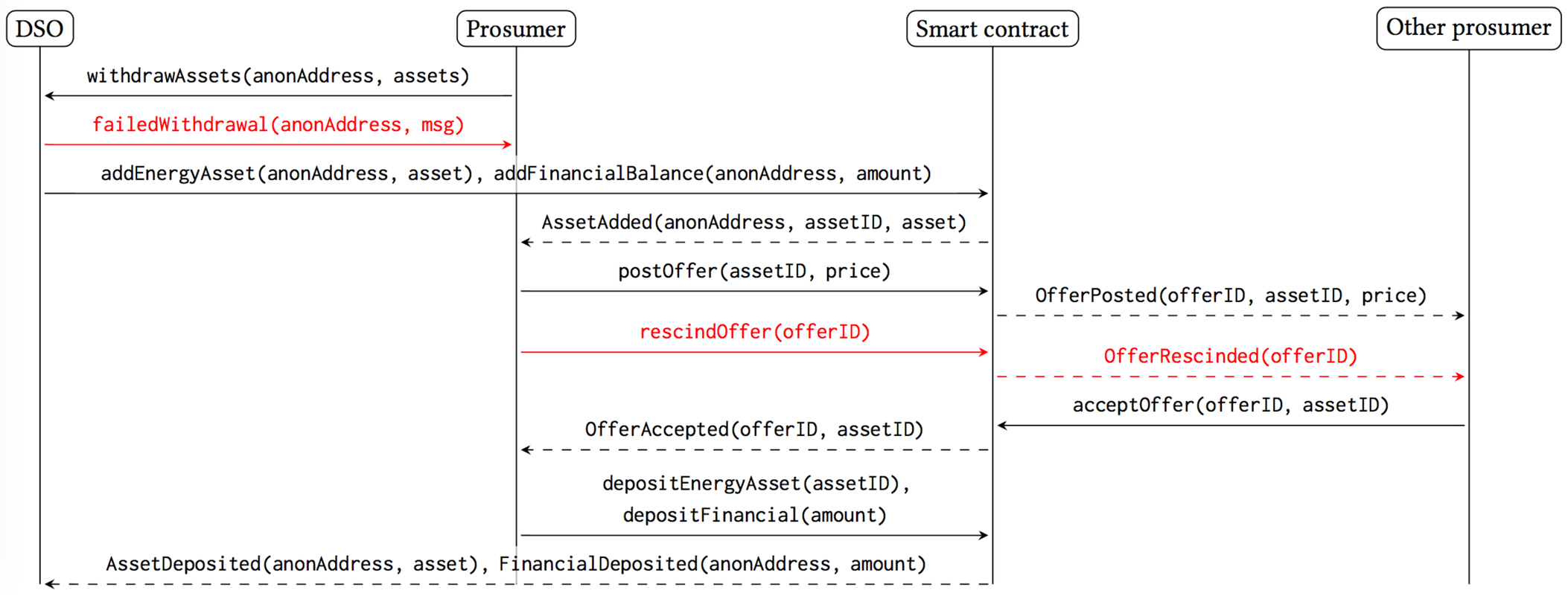
Transactive Microgrid



Architecture

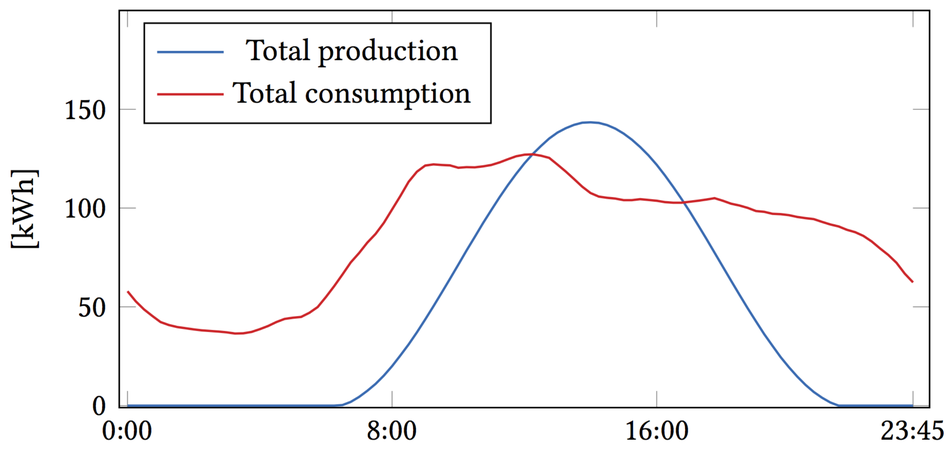


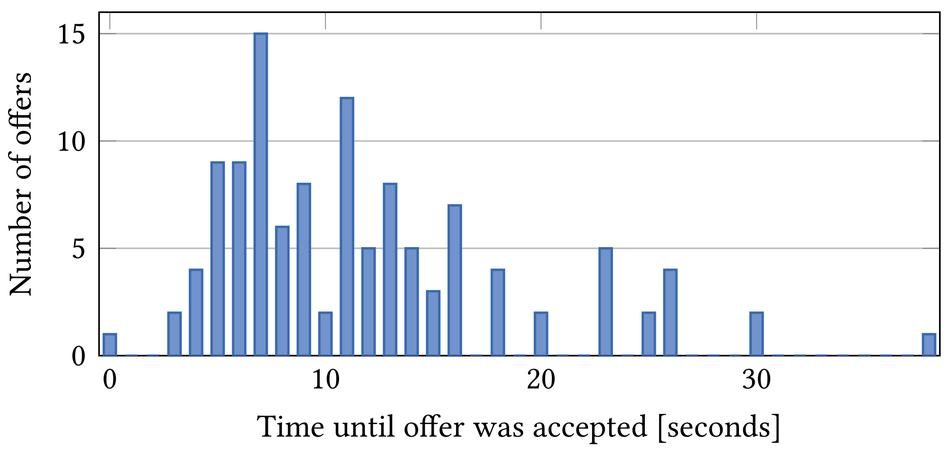
Trading Workflow



Evaluation

- We evaluate performance using a real-world energy usage dataset
- 90% of the trades were closed within 23 seconds or less





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