INTERSECT 19
The New Energy Ecosystem

Georgia Tech Energy Policy and Innovation Center

Transactive Energy Control with Blockchain

A Scoping Study for a Future Demonstrator at Georgia Tech

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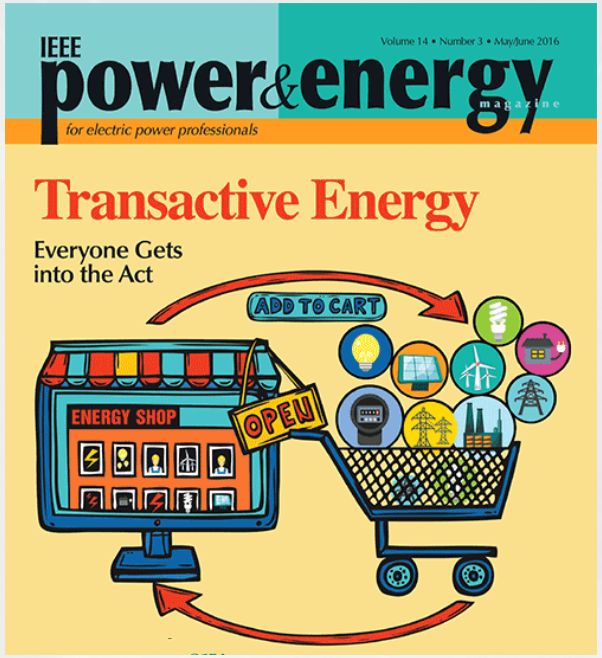
The Concepts

- Transactive energy
  - System of economic and control mechanisms that allows the dynamic balance of supply and demand across electric power grid systems
- Blockchain
  - A digital ledger that allows peer-to-peer transactions to be authenticated and automated in an efficient and secure way
  - Ensures trust in the transactions across a distributed system
- Together they hold promise to make future grid systems more flexible, reliable, and secure



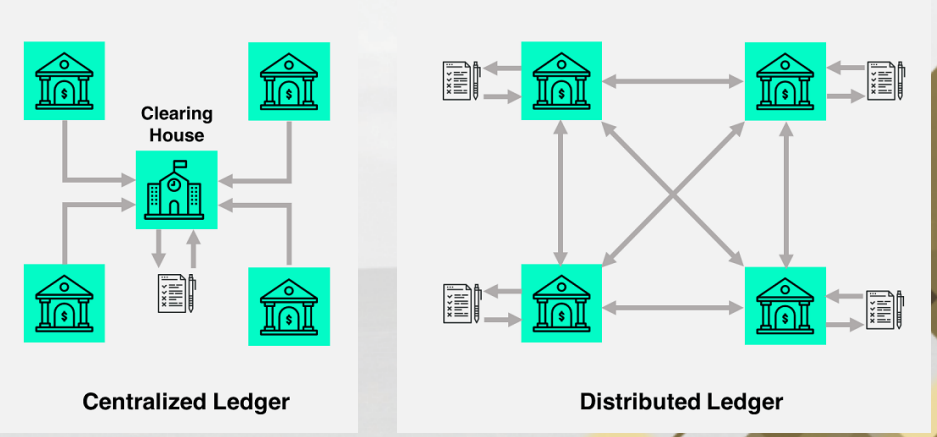


Figure from: https://tradeix.com/distributed-ledger-technology/

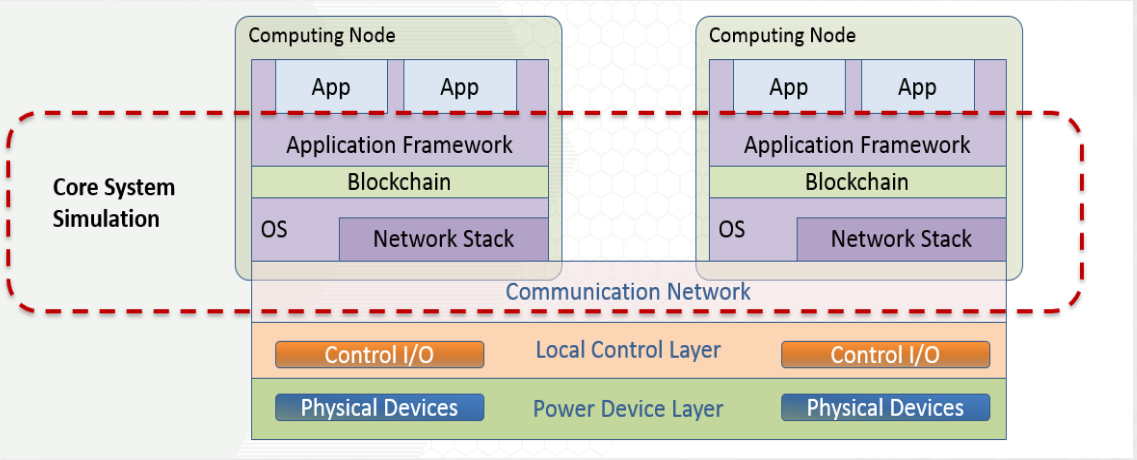
Goal: A Demonstrator, Locally

- Can we pilot **blockchain-enhanced transactive energy** at GT?
- Need a Scoping Study to determine:
  - Requirements for TE/BC given the particular characteristics (e.g., at building and grid scales) of GT campus energy systems
  - Technical workings and dynamics of TE and BC technologies, from physical as well as software perspectives, in order to characterize benefits and limitations.
  - Potential systems architectures for a TE demonstrator, integrating physical & software systems

Scoping Study: Steps

- Define requirements for transactive energy (TE) and blockchain for GT Campus
- Model components of GT's physical energy systems which could participate in TE
- Simulate TE between energy subsystems
- Implement algorithms at pilot scales
- Identify opportunities for TE at GT
- Define preliminary architecture & roadmap for TE demonstrator

Simulation Architecture



Possible Use Case