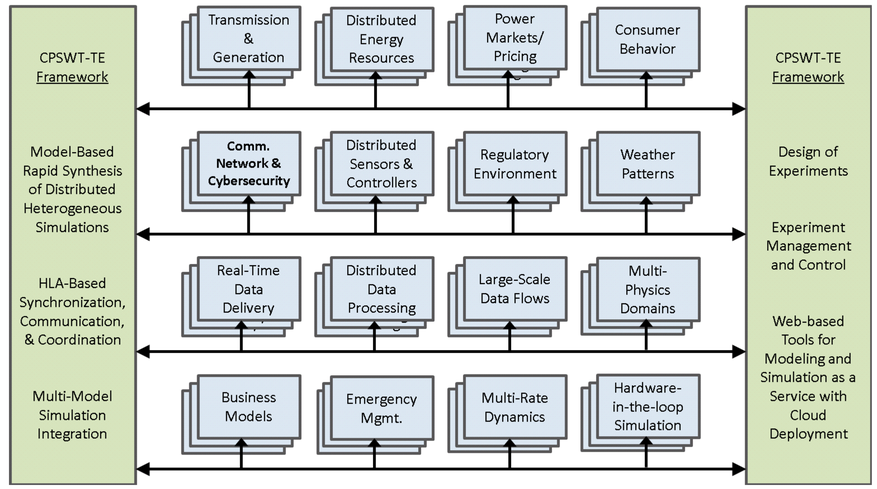
CPSWT-TE: A Reusable and Extensible Web-Based Co-Simulation Platform for Transactive Energy Systems

Himanshu Neema, Janos Sztipanovits, Xenofon Koutsoukos

*Institute for Software Integrated Systems, Vanderbilt University, Nashville, TN, USA**

http://cps-vo.org/group/C2WTTE

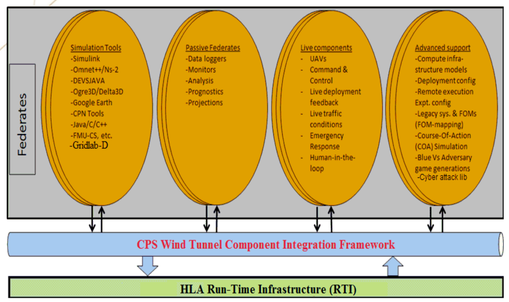
- **Open platform** for modeling & simulation of power grids with transactive energy systems
- Flexible, customizable, and extensible **plug-and-play** of TE component models and tools
- **Web-based collaborative environment** for both modeling, experimentation, and analysis
- **Integration library** for tools: Gridlab-D, OMNeT++, Simulink, CPNTools,…
- **Model library**: Resource, Generator, Transmission, Distribution, Cyber-Attack, Business
- **Community** of users, library developers, stakeholders, with access/IP control mechanisms



Reusable & Extensible Framework & Tools

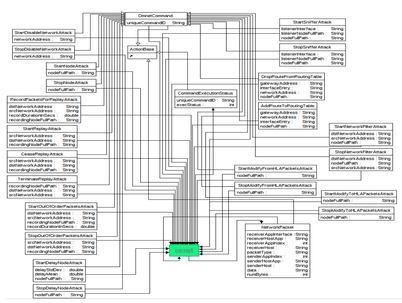
SIMULATION INTEGRATION TOOL KIT

- Model-based and standards-based heterogeneous simulation integration
- Scenario-driven experimentation
- Library of models, reusable wrappers



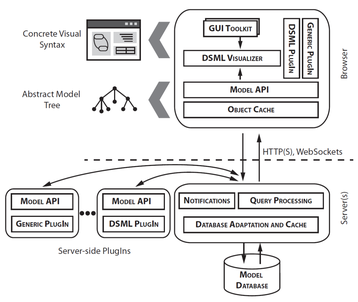
REUSABLE NETWORK SIMULATION
REUSABLE CYBER-ATTACK LIBRARY

- Custom INET modules and protocols
- Parametric and configurable topologies, applications, protocols



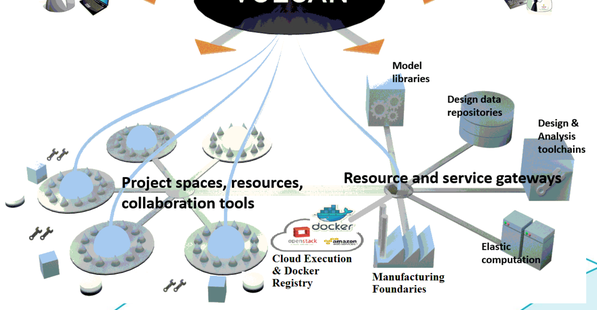
COLLABORATIVE MODELING: WEBGME

- Metamodeling; Program Synthesis
- DSMLs; Abstract/Execution Semantics
- Web-Based; Scalable; Extensible
- Multi-User; Full Revision Tracking

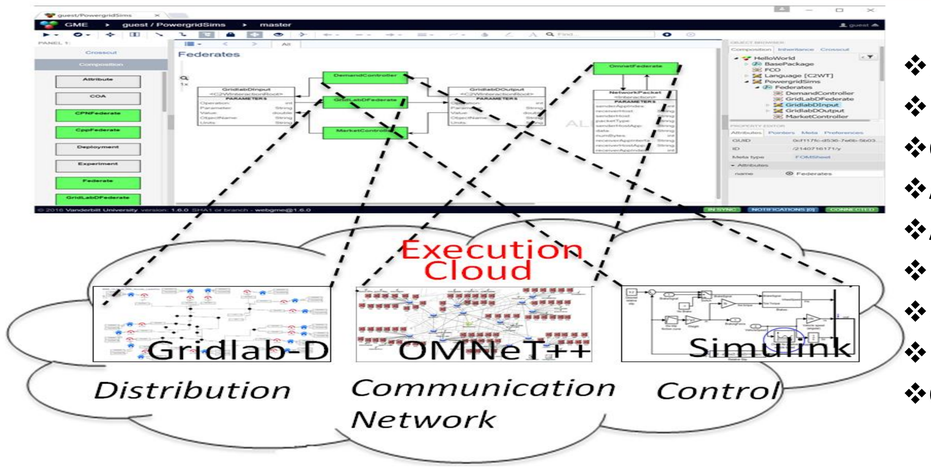


PROJECT COLLABORATION: VULCAN

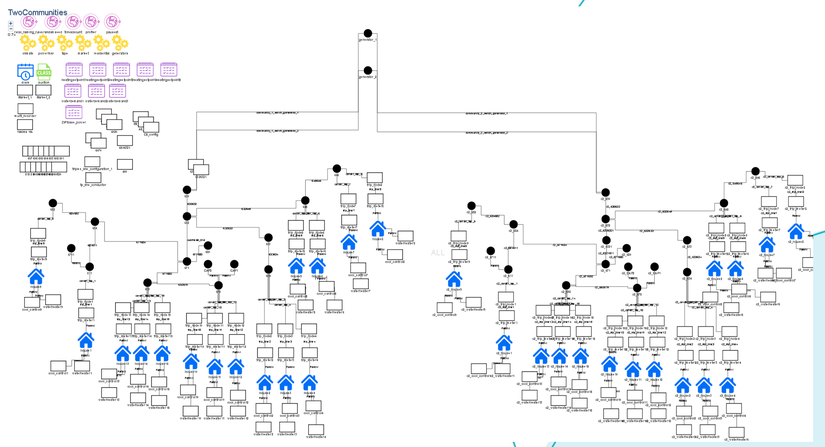
- Project Hosting; Shared Resources
- Collaboration & Design Tools
- Cloud Execution; Docker Registry



Scenario: Independent Communities & Generators Connected via Power-Grid, Communication Network, and Market-Based Power Transactions



- Build system
- Repositories
- Change tracking
- Authentication
- Analysis tools
- Error handling
- Experiment tools
- Monitoring & control
- Cloud deployment



- Generation; Distribution
- Two Community Micro-grids
- Two Centralized Generators
- Community Demand Controllers
- Generator Price Controllers
- Fix Generation and Load Profiles
- Transactive Demand Response
- Integrated Comm. Network
- DOS/Delay Cyber-Attacks
- Simulation as opposed to Mathematical Analysis

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