

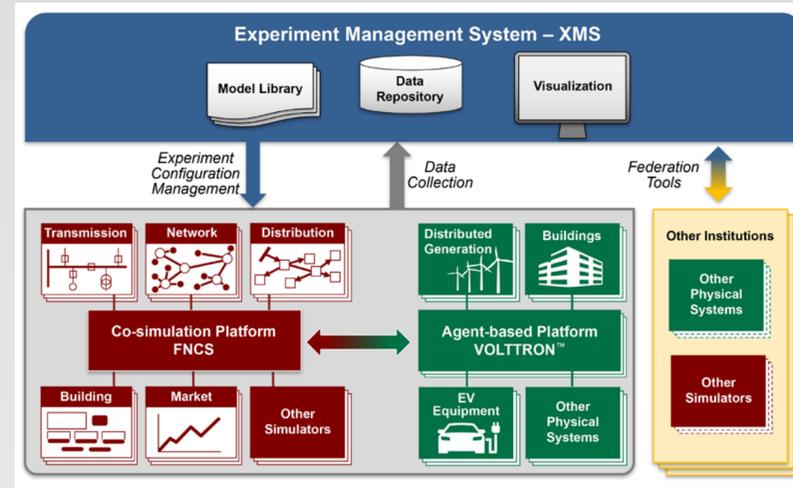
## Project 3.4 Experiment Management for Complex Systems Test Bed

Test Bed as a Service

Mark Rice (PI), Thomas Edgar (Co-PI), Shwetha Niddodi, and Theora Rice

### Objective

To build the Experiment Management System (XMS), which will enable researchers to effectively perform rigorous experiments that have complex interactions between a wide variety of components.



### Methodology

The XMS deploys and manages experiments in the CCSI Test Bed:

- Enabling descriptive definition of infrastructure with ability to upload simulator configurations
- Automating the orchestration of computing infrastructure, simulators, and executions
- Collecting baseline and experiment data for analysis and archiving



Integration of XMS with CCSI Test Bed demonstration at PNNL Campus



### Results

In 2017, XMS developments focused on improved integration of VOLTRON™ and alignment of Test Bed data collection with PNNL institutional strategies. Key highlights:

- 1. Integration of VOLTRON™ to enable control-of-hardware resources**
  - Tied XMS to VOLTRON™ Central, allowing access to all data being collected from campus buildings
  - Tested capabilities to configure bounds on the VOLTRON™ controls to ensure an experiment does not damage equipment
  - Defined interface and communication pipeline with VOLTRON™ and federation teams to pipe data from external institutions
- 2. Test Bed data collection capability**
  - Integrated Pacifica (data management) to transfer data from Test Bed to institutional computing
  - Created meta-data tags for Pacifica to improve data searching
  - Published data from Test Bed experiments for use by others at PNNL
  - Currently working with Data Stewardship Board to define/audit PNNL building data

