

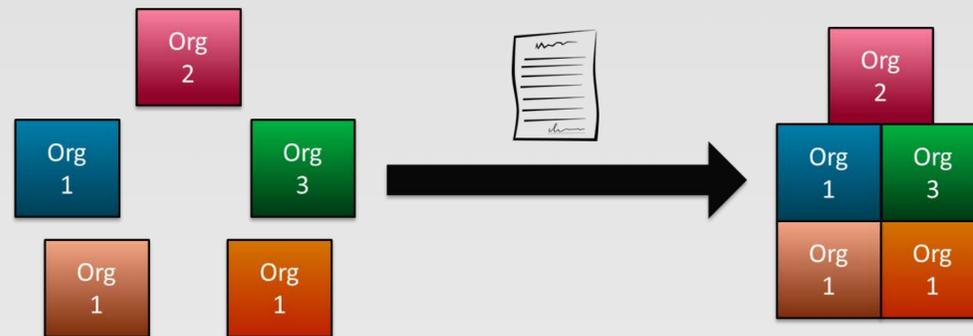
Project 3.6 Test Bed Federation Tools Providing Remote Access to Resources for Research

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Objective

- Enable a federated test bed for experiments on control of electric energy systems
- Develop a tool suite for simulation, emulation, hardware, and near real-time federation experimentation
- Decrease technical barriers to implementation of federation

Independent Autonomous Organizations



Methodology

Develop “Fed-in-a-Box” tools to enable federation on technical level:

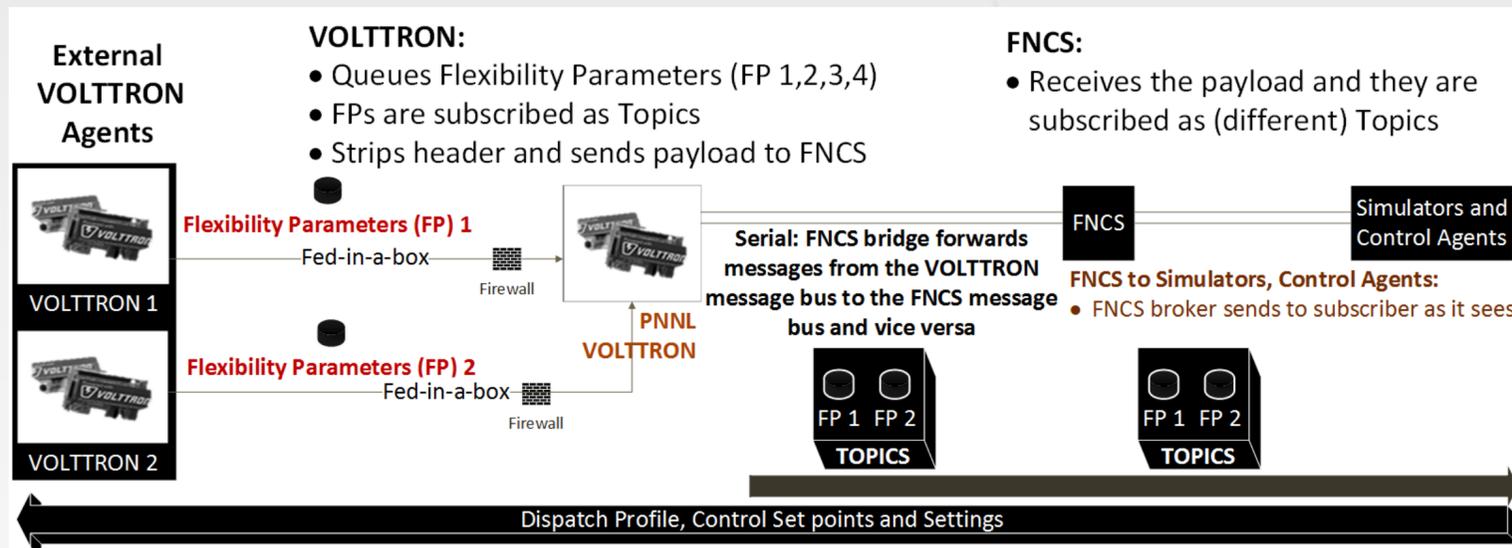
- VPN tool for collaborators to connect to test bed
- Configuration control procedures to preserve integrity
- Unified test setup design tools

Types of Federation

- Shared experimentation design
- Shared model
- Shared applications
- Shared network
- OSI Layer 3 – Network Layer
- **OSI Layer 2 – Data Link layer**

Use case shown below falls under Layer 2

Results – Federation Use Case(s)



- Began pilot federation with UTRC
- Identified concurrent second partner (Spirae) for federation
- Worked with partners for initial federation needs, requirements, and expectations
- Drafted initial federation exercise
- Tested federation tool suite “on campus”/“internal” testing across campus

Future Work

- Complete federation experiments with UTRC and Spirae
- Establish a Fed-in-a-Box virtual machine and self install version
- Identify varying levels of federation from layer 2 to experimental design sharing
- Advance auto detection and registration of remote platforms
- Integrate XMS
- Enable VOLTRON™ testing and demonstration