VISION for the Information Layer and Assessment Bus (iLab)

The Information Layer and Assessment Bus (iLab) provides an underlying data and communications backbone to enable and test the information layer of integrated hardware experiments across multiple labs in ESIF and multiple off-site locations. iLab delivers value by offering the flexibility to test a wide range of communication, control, data, and computation architectures for integrated energy systems while also supporting data acquisition and experimental coordination for both the information layer itself and the physical electric, thermal, and environmental conditions under its control. iLab is successful because users can easily and reliably connect new communication enabled devices, configure the corresponding control architecture, and orchestrate the testing environment using the protocols of choice.

iLab provides:

- Support for 4 types of functionality:
    - Communication pathways for information systems under test
    - Coordinated "scientific" data collection. This will draw from diverse existing and future experimental data acquisition, include metadata about the experimental design, characterize the information layer itself and support coordinated integrated experiment data acquisition (power, voltage, pressures, temps, etc),
    - Simulation coordination such as multiple grid simulator and environmental control
    - Analog signal exchange
- Flexibility for the cyber-system under test. It enables rapidly swapping control and communications equipment under test with minimal hardware changes, minimal re-configuration, and streamlined interconnection processes;
- Transparency to the user. As much as possible it acts as if all connection points are in the same room/location—unless deliberately configured with delays or reduced quality of service;
- Data acquisition of the information layer itself and
- Support for testing needs of the INTEGRATE project and a foundation for future integrated experiments using ESIF.