A Technology for Efficient Buildings and Integration of Distributed Energy Resources with the Grid

VOLTTRON™, developed at Pacific Northwest National Laboratory, is a distributed control and sensing software platform. Used in concert with special applications known as V-agents, VOLTTRON™ analyzes and converts growing data streams from today’s buildings to actionable information that improves building operations, manages energy consumption and enables true integration of buildings with the electric grid. VOLTTRON™ independently and securely manages a wide range of devices, such as heating, air conditioning and ventilation (HVAC) systems, electric vehicle chargers, distributed energy resources (including renewables and batteries) and entire building loads. Mobile and stationary software V-agents perform information gathering, processing and control actions.

VOLTTRON™’s Key Benefits:
Cost-effective – Open source software (free to users) and can be hosted on inexpensive computing resources
Scalable – Can be used in one building or a fleet of buildings
Interoperable – Enables interaction/connection with various systems and subsystems, in and out of the energy sector
Secure – Underpinned with a robust security foundation to combat today’s cyber vulnerabilities and attacks

VOLTTRON™’s Primary Use Areas:
Building Efficiency – To help control building energy system performance
Building-Grid Integration – To support “beyond demand response” approach and integration of distributed energy resources into the grid
Transactive Control – To support a scalable, distributed control mechanism for transacting information about systems, loads, and constraints to deliver user specified services

VOLTTRON™ TIMELINE
» VOLTTRON™ developed (September 2012)
2014
» Deployed in DOE Transactive Network Project (March)
» Released as open source software (April)
» First DOE-sponsored user forum (July)
» Release of Version 2.0 (September)
2015
» Second DOE-sponsored user forum (July)
» Release of Version 3.0 (September)
2016
» Deployed by Transformative Wave in Northwest buildings (Spring)
» Implemented in DOE Clean Energy and Transactive Campus Project (Spring)
» Deployed by Intellimation in D.C. buildings (Spring)
» Applied in DOE grid modernization projects (Summer)
» Third DOE-sponsored user forum (August)
» Release of Version 4.0 (September)
2017
» Fourth DOE-sponsored user forum (May)
» Incorporated in connected homes project in southeast U.S. (Fall)
» Release of Version 5.0 (September)
2018
» Planned transition to Eclipse Foundation
VOLTTRON™ is available to the public for download. Visit https://github.com/VOLTTRON/volttron to learn more. Redistribution and use of VOLTTRON™ in source and binary forms are permitted in accordance with VOLTTRON™ Terms listed on GitHub.

An “Office Hours” users group has been formed to periodically discuss the technology and new developments. For general information about VOLTTRON™ and/or the users group schedule, contact volttron@pnnl.gov.

Web page: Volttron.org