

Battelle Number(s):

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Patent(s) Issued

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Available Technologies

VOLTTRON™: Agent Execution Platform for the Electric Power System

SUMMARY

Ever increasing numbers of sensors and controls are being deployed into the smart grid, but the infrastructure to exploit these resources is not keeping pace. VOLTTRON™ is a software agent execution platform that was designed to support distributed control for electric power grids, but it may also apply to other industries where large numbers of control points suggests a need for distributed control. VOLTTRON™ provides a means for deploying intelligent agents which can utilize multiple and diverse grid resources to perform decentralized cooperative decision making. This system will allow energy customers, building owners, and utilities to realize better energy efficiency and reliability.



VOLTTRON™ fills the need for an independent language-agnostic agent platform with built-in security and resource management. It provides resource guarantees for agents in the platform, including memory and processor utilization, authentication and authorization services, directory services for agent and resource location, and agent mobility. Unlike most other agent platforms, VOLTTRON™ does not depend on a single agent authoring language. Instead, it was designed and implemented as a platform service and framework that is decoupled from the agent execution environment. A prototype implementation of VOLTTRON™ has been written in Python™ (using Python v2.7.2) with executed agents written in Python and Java, and as shell scripts. The intended use of VOLTTRON™ is in the power distribution system for managing distributed generation, demand-response, and plug-in electric vehicles.

ADVANTAGES

- * Lays the software platform groundwork for distributed operation and control of the electric power system
- * Supports the distribution layer where end-customers are being served
- * Designed and implemented as a platform service and framework that is decoupled from the agent execution environments

RELATED LINKS

- » [Future Power Grid Initiative home page](#)

This work was developed as part of PNNL's "Future Power Grid Initiative," which will develop next-generation algorithms and tools for networking, modeling and simulation, and visualization and decision support to drive the transformation towards a more reliable and efficient future power grid.
<http://gridoptics.pnnl.gov/>

Patents & Intellectual Property

» Patent application #: 2013 / 30036311

Technology Portfolio(s)

» Electric Utility Operations

» Smart Grid Devices

Potential Industry Applications

» Energy & Utilities

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