



Pacific Northwest
NATIONAL LABORATORY

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VOLTRON™ 4.0 Features

CRAIG ALLWARDT

Pacific Northwest National Laboratory

VOLTRON™ 2016



Motivations

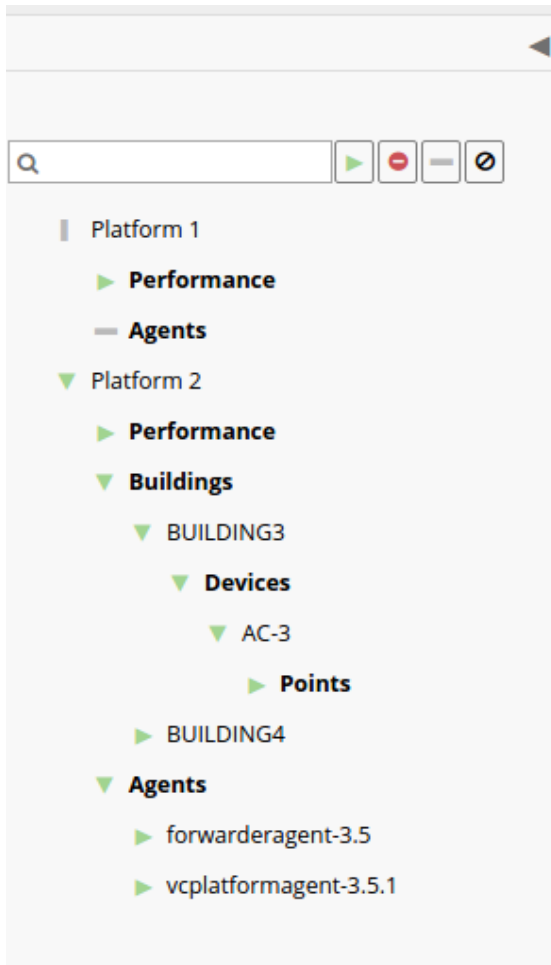
- ▶ 3.0 improved security and flexibility
 - Usability and scalability paid a price
- ▶ Improve usability of instance registration and management
- ▶ Improve configuration of platform for remote access
- ▶ Make documentation more accessible and more in line with current state of code
- ▶ Improve the process of validating 3rd party agents.
- ▶ Meet the requirements of facility managers

- ▶ Command line configuration setup: volttron-cfg
 - Used to setup individual instances of the VOLTTRON™ platform.
 - Specify vip address
 - Agent creation and configuration
 - Create VOLTTRON™ Central(VC)
 - ◆ Specify exposed http/https address to bind to
 - ◆ Specify the external ipv4 VOLTTRON Interconnect Protocol (VIP) address.
 - ◆ Specify administrator credentials for access.
 - Create VOLTTRON™ Central Platform
 - ◆ Specify the VC to auto register with
 - Create a “platform.historian” that VC can read from
 - Extensible framework to allow for other recipes

- ▶ Continuous integration tests run after every push to github
 - After forking repository you can setup your own travis-ci build to monitor your code changes.
- ▶ Allows for code standards and completeness of code during a pull request.
- ▶ Can be used to test that new instances of services meet the requirements of the platform (validate new drivers and historians)
- ▶ Easy to run locally
- ▶ Extensible by community



VOLTRON™ Instance Management



- ▶ Resource tree
- ▶ Charting Interface
- ▶ Changes from 3.0-3.5
 - PlatformAgent -> VolttronCentralPlatform (VCP)
 - No longer requires Tornado (we use a gevent based solution)
 - WebAPI





VOLTRON™ Instance Management Cont.

- ▶ Ongoing Changes 3.5 – 4.0
 - Change from polling interface to using web sockets
 - More responsive UI especially with larger deployments
 - Upgrade from 0.13 react framework to 0.15 allows the web sockets
 - Adding centralized (VC based) config store
 - GUI based device driver configuration



Historian Updates

- ▶ MongoDB
- ▶ ForwardHistorian
- ▶ AggregatingHistorian (in development)



Driver Updates

- ▶ More flexible BACnet Driver
 - Configurable priority per point
 - Improved scanning and configuration generation
- ▶ Device Configuration UI Planned
- ▶ Revert Capability
 - Configuration can include “default values” for devices
 - Actuator issues a command telling devices to revert



Housekeeping

- ▶ Applications directory now in its own repo
- ▶ Documentation moved to readthedocs
 - Github wiki deprecated
 - Google docs User Guide deprecated
- ▶ Starting to use Stack Overflow
 - Allows anyone to answer questions
 - Provides a efficient means to search for questions specific to VOLTTRON™



Configuration Store

- ▶ VIP Identity Changes
 - Assignment of identity can be specified or is assigned reliably.
- ▶ Modification of agent configurations through VC
- ▶ Update settings of agents as they are running



Integration with Simulations

- ▶ Develop agents without actual buildings/equipment
 - Investigate platform
 - Validate agent behavior prior to deployment
 - Develop agent in a familiar language (MATLAB) before or without switching to Python



Migration from 3.0 to 4.0

- ▶ Not as drastic as 2.0 to 3.0 which saw a re-implementation of the message bus (VIP)
- ▶ Drivers
 - The BACnet driver configurations now require device ids.
 - 3.0 configurations had the line:
"driver_config": {"device_address": address},
 - 3.5 configs needs the following addition to the the driver_config dictionary:
"driver_config": {"device_address": address, "device_id": id},
- ▶ Historian
 - The 3.5 MySQL historian will try adding rows to a metadata table but will not create the table automatically. It can be added to the database with
 - CREATE TABLE meta(topic_id INTEGER NOT NULL,
metadata TEXT NOT NULL,
PRIMARY KEY(topic_id));
- ▶ ActuatorAgent
 - The Heartbeat agent has been removed in version 3.5, its job now being done from within the actuator. The period of the heartbeat toggle function can be set by adding: "heartbeat_period": 20 to the actuator's config file. This period defaults to 60 seconds if it is not specific.