VOLTTRON™ Deployment Management

CRAIG ALLWARDT
JEREME HAACK
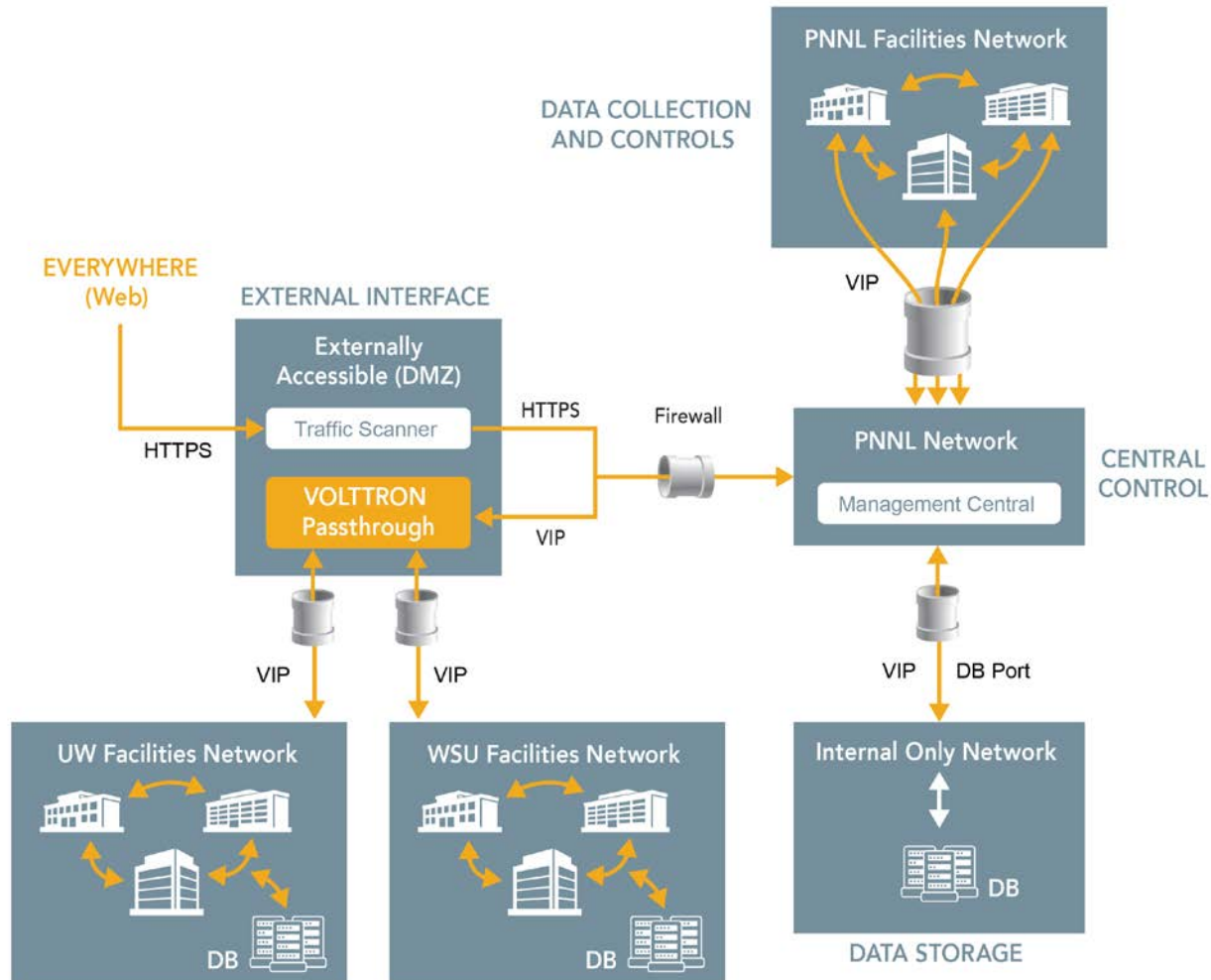
Pacific Northwest National Laboratory

VOLTTRON™ 2017

Deployment Management

▶ CETC Deployment History

▶ Decisions

▶ Current State

VOLTTRON™ Campus Deployment (The Goal)

PNNL Campus Deployment (The Beginning)

Pacific Northwest
NATIONAL LABORATORY

Proudly Operated by **Battelle** *Since 1965*

► First collection on a leased building

- Data pushed to cloud instance for storage
- Initial use case for Forwarder Agent
- Simple, manual install and monitoring

► Expanded out piecemeal to other buildings (currently at 8)

► Manual updates become untenable

► Monitoring even more important

► Wider potential impact of problems

Deployment Driven Requirements (The Needs)

► Possible Networking Issues
- Alerts
- LogWatcher
- External Monitoring

► Experiments on Real Buildings
- Override/Revert of Known Good State
- Threshold Detection

► External Collaboration
- Topic replacement
  - Anonymization of Building Source
- Filtering of topics forwarded off-site

► External Logging Real Time Monitoring
- Splunk
- Grafana
- Prometheus

Configuration Management (The Pain)

► Original Process:

  ■ ssh into box

  ■ Install dependencies

  ■ Clone (pull) repository

  ■ Configure Instance(s)

  ■ Package, configure and install many agents

  ■ Setup keys for forwarder and VOLTTRON™ Central Management

► Repeated on every instance!

► Updates can be painful and require almost the same level of work

Automated Configuration Management (The Solution!)

▶ Options
  - Chef
  - Puppet
  - Ansible

▶ Selected Ansible
  - Requires SSH and simple-json
  - No service running on the target system
  - Active development open source environment
  - Ansible Galaxy
    - Roles for just about everything

VOLTTRON™ Roles for Different Platform Responsibilities

► volttron-common

  ■ Configures and bootstraps the volttron environment.

► volttron-service

  ■ Starts volttron as a systemd based service

► volttron-central

  ■ Installs volttron central, volttron central platform and platform historian, alerter, emailer

► volttron-collector

  ■ Installs masterdriver, actuator, volttron central platform

► volttron-agents

  ■ Allows ad-hoc agents to be installed on an instance

► Original Process:

  ■ ssh into box

  ■ Install dependencies

  ■ Clone (pull) repository

  ■ Configure Instance(s)

  ■ Package, configure and install many agents

  ■ Setup keys for forwarder and VOLTTRON™ Central Management

► Repeated on every instance!

► Updates can be painful and require almost the same level of work

Benefits

- ► Declarative
- ► Repeatable
- ► Easy to Modify at Scale
- ► Saves Time