U.S. DEPARTMENT OF ENERGY | OFFICE OF CYBERSECURITY, ENERGY SECURITY, AND EMERGENCY RESPONSE

# Chess Master Project

# Schweitzer Engineering Laboratories Inc. (SEL)

**Dennis Gammel**

**Cybersecurity for Energy Delivery Systems Peer Review**

November 6-8, 2018

# Summary: Chess Master Project

## Objective

- Establish strong deny-by-default programmable network access control, greater situational awareness and automated event response with SDN leveraging interoperable API

## Schedule

- Oct 2016 – Sept 2019
- Key deliverables and dates expected/met
- Proactive policy based network access control with disruptionless scalability and automated event response

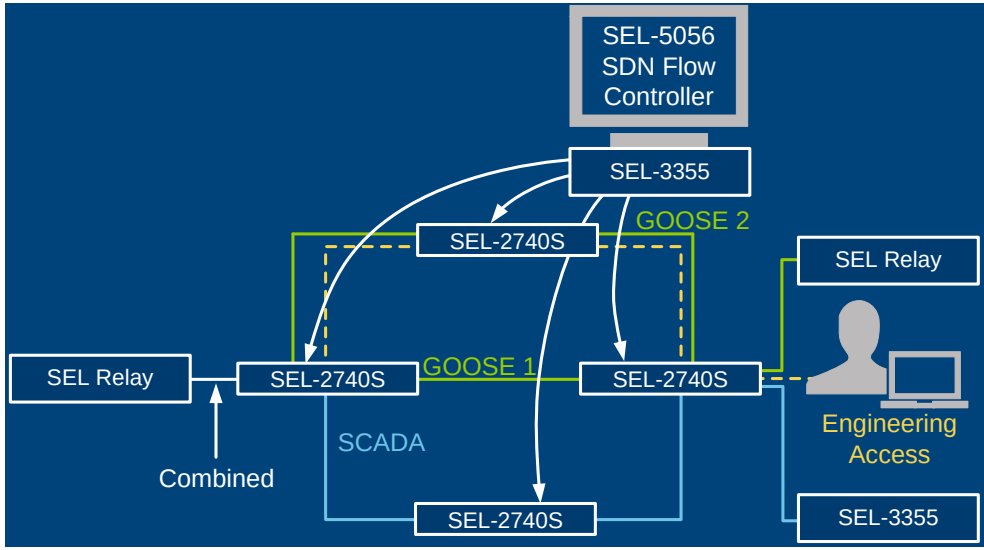

| | |
|---|---|
| **Total Value of Award:** | **$ 5M** |
| **Funds Expended to Date:** | **% [($spent/total award value)*100]** |
| **Performer:** | **Schweitzer Engineering Laboratories Inc.** |
| **Partners:** | **Ameren, Sempra, and Veracity** |

# Current “State of the Art” Closed, Reactive and Restrictive

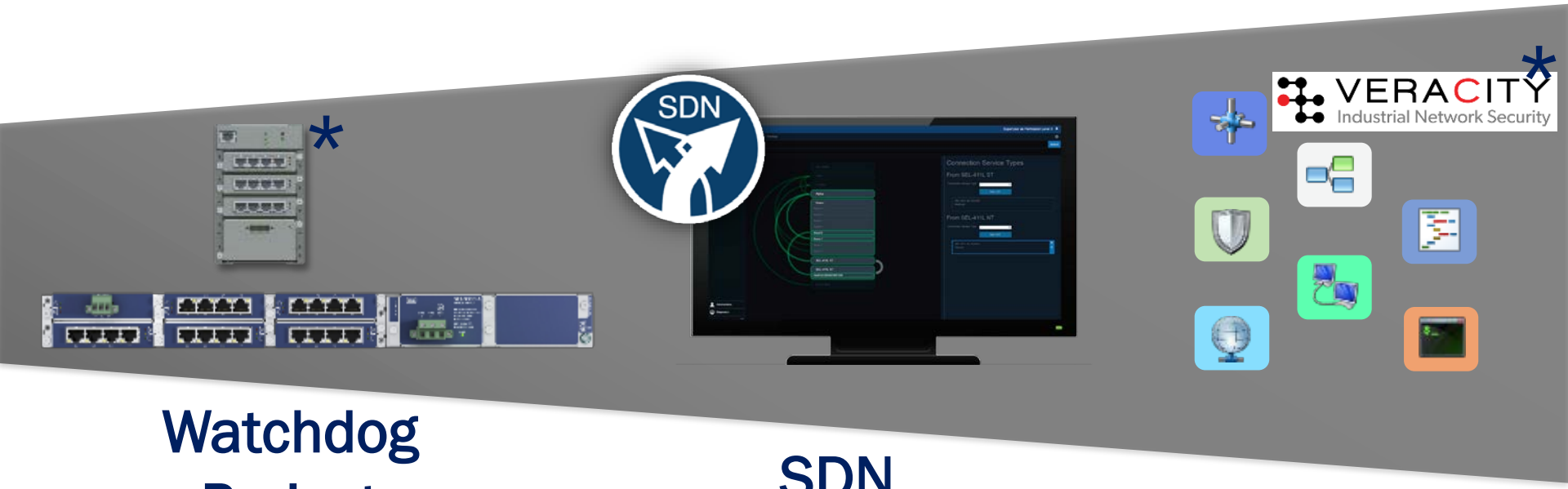
- Unicast, multicast, and broadcast forced behavior
- Dynamic MAC learning and flooding
- Slow and fixed reactive loop resolution and forced asset efficiency reductions
- Layers and layers of complexity attempting to changed the original specified behavior
- Vulnerable control plane – plane text, no authentication, no crypto, inherently trusted
- Decade old vulnerabilities in network recon, MAC table poisoning, and control plane spoofing

# Advancing the State of the Art

- Secure control plane
- Physical and logical traffic engineering
- Mitigates legacy network vulnerabilities
- Multi-layer packet inspection at each hop
- Know who, what, and where is on your network
- Policy based flow management
- Pre-engineered event response
- Network automation



# Advancing the State of the Art Scalable and Interoperable Eco-System




Watchdog Project

SDN Project

Chess Master* Project

# Challenges to Success

## Application Programming Interface supporting Energy sector product lifecycles

- Research lessons learned in other industries
- Talked to many suppliers beyond the Chess Master Project

## Capture use cases for the new network security controls and the automation requirements

- System owner education and review
- Researched and collected feedback from many system owners

## Test plan execution validating safe and reliability

- Leverage SEL's established critical infrastructure test processes
- Set up and run proof of concept systems against the RTDS

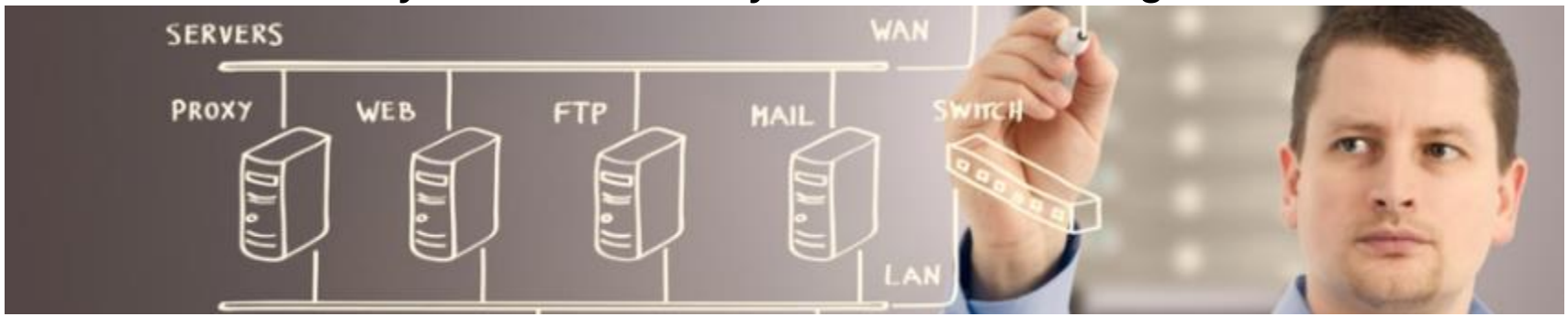
# Progress to Date

- **Use cases and benefit whitepaper published and picked up in multiple trade magazines**
  **https://www.energy.gov/oe/articles/article-cybersecurity-energy-delivery-systems-ceds-program-s-chess-master-project-now**
- **Product development on schedule**
  - Veracity to release security policy enforcement application by first of 2019
  - SEL to release DIN rail switch by mid 2019
    SEL to release flow crypto by Sept 2019
- **Testing and validation on schedule summer of 2019**

# Collaboration/Technology Transfer

## Plans to transfer technology/knowledge to end user

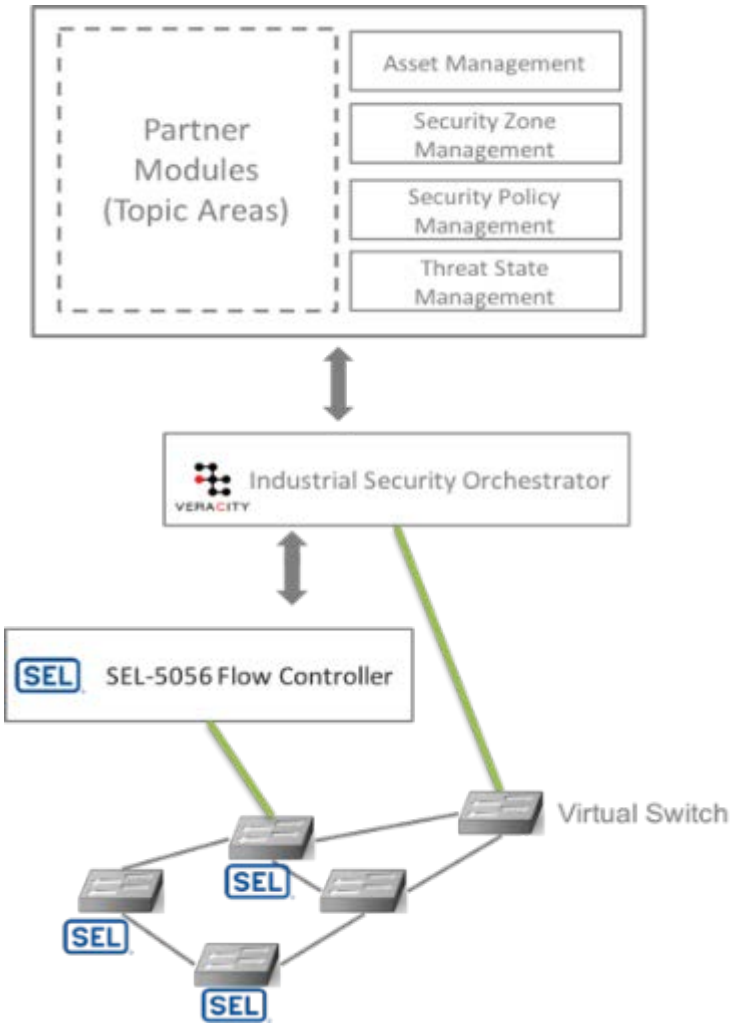
- SEL-2740S rack mount OT SDN switch available today
- SEL-5056 OT SDN flow controller available today
- SEL-2742S DIN rail mount OT SDN switch available mid 2019
- Veracity security policy enforcement application available first of the year
- If changes are suggested to OpenFlow they will be submitted late summer 2019
- SEL University has a three day hands-on training course



# Next Steps for this Project

## Approach for the next year or to the end of project

- Complete product development and commercially release
- Schedule and execute validation testing
- Complete technology supporting literature and update training material when product development is completed



# Questions?