



U.S. DEPARTMENT OF
ENERGY

OFFICE OF
**CYBERSECURITY, ENERGY SECURITY,
AND EMERGENCY RESPONSE**



Enhanced Power Edge Security Intel Corporation

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Cybersecurity for Energy Delivery Systems Peer Review**

November 6-8, 2018

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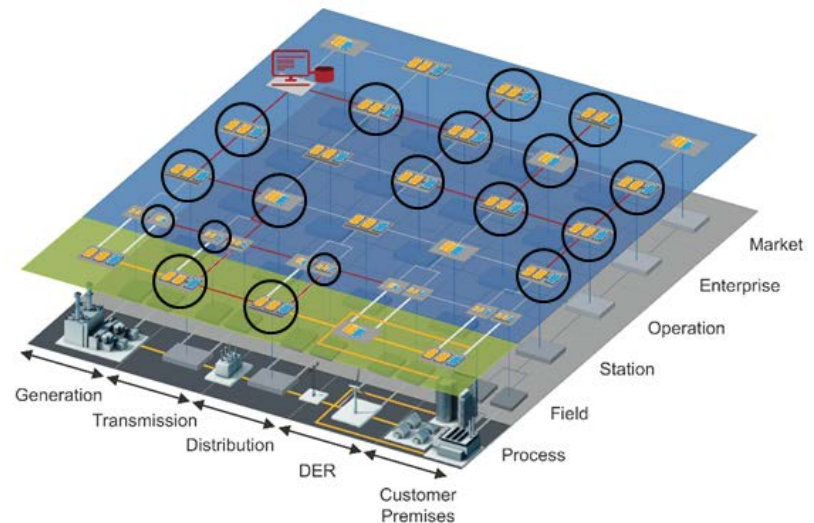
Summary: Enhanced Power Edge Security

Objective

- Enhance reliance/resilience of the nation's energy infrastructure through End-to-end security solution.

Schedule

- Oct 2016 – Sept 2019
- Gateway solution to protect the network communication in legacy systems and a greenfield solution to create new secure devices
- Gateway solution completed. FPGA solution in progress



Total Value of Award: \$ 4,441,532 (\$1,188,019 participant cost share)

Funds Expended to Date: % 55

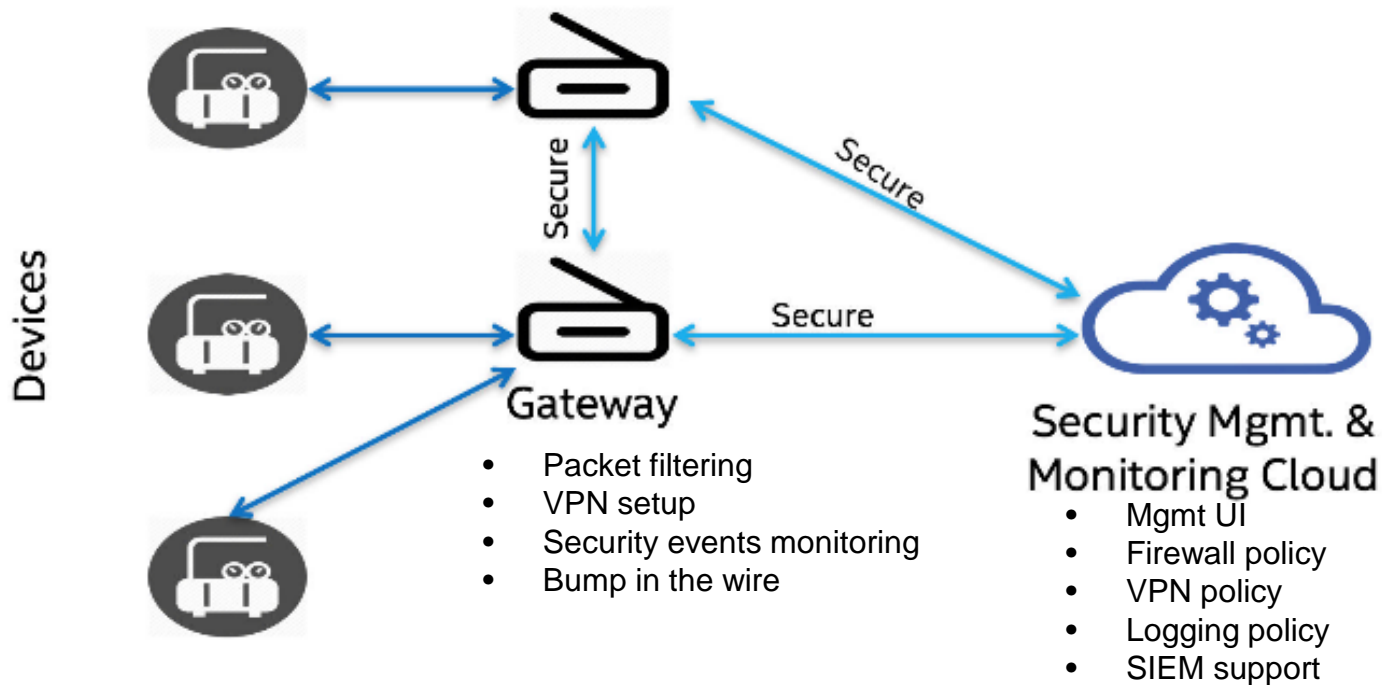
Performer: Intel Corp.

Partners: Schneider Electric,
LiveData Utilities

Advancing the State of the Art (SOA)

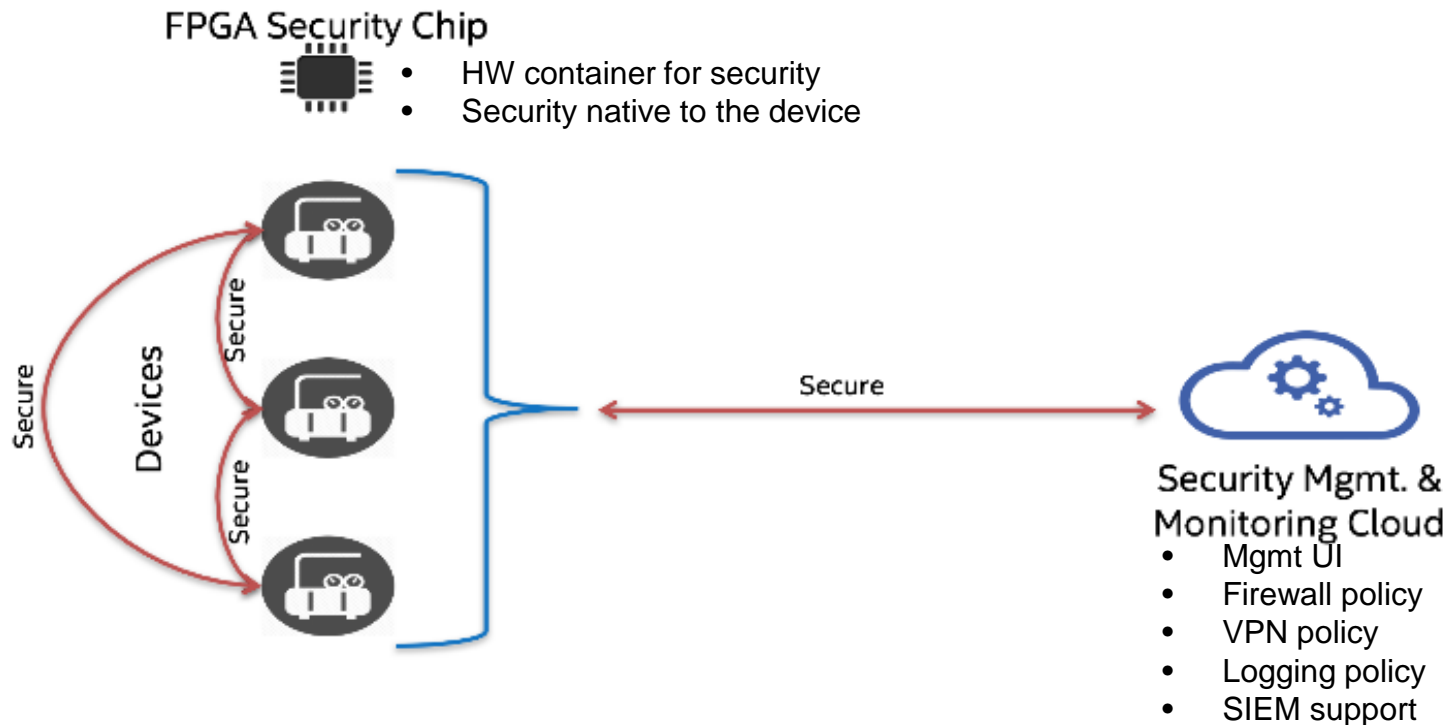
- **No or minimal security in legacy systems**
- **Adding security appliances to legacy systems require significant reconfiguration**
 - Risky with large downtime
- **Multiple security vendors that do not interoperate**
 - Improperly configured systems or applications compromising the security
- **Tension between OT and IT**
 - OT more focused on functionality, IT on security
- **Objective of our solution:**
 - Provide a security focused system independent of OT application
 - That can be remotely configured and monitored
 - That provides a 'Security wrapper' around applications
 - With open standardized security APIs

Gateway Solution



Legacy Brownfield Deployment

Greenfield Solution



New Greenfield Deployment

Challenges to Success

- **HW development is expensive and risky**
- **Larger FPGAs are expensive**
 - Requires a careful balance between cost and functionality
- **Ecosystem enabling**
 - Standardization helps but has its own challenges
- **It is hard to sell security – customers want functionality with built-in security**

Progress to Date

Major Accomplishments

- Gateway solution has been productized
- Solution supports both on-prem as well as cloud security management and monitoring
- Successful demo of the solution at Schneider Electric microgrid
- RFP and SoWs in progress with hardware IP vendors and ISVs for security chip and software development

Collaboration/Technology Transfer

- **Ecosystem consists of OEMs, ISVs and Service Providers**
- **Planning to develop and bring solution to market**
- **Gateway solution installed at Schneider Electric facility**
- **Demonstration plans:**
 - Deploy in a Utility testbed H1'19
 - Engage with National Labs for red team testing
 - Pursuing additional opportunities within IAB

Next Steps for this Project

- **Complete development of security chip**
- **Integrate security functions with service providers and ISVs**
- **Publish and standardize Security APIs**