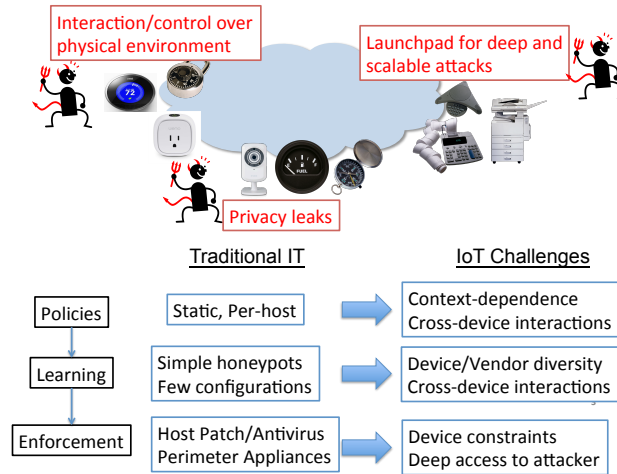


Handling a Trillion Unfixable Flaws on Billions of Internet-of-Things

Carnegie Mellon University

Challenge:

- Increasing number of insecure IoT devices
- Traditional IT security is mismatched with IoT ecosystem
 - Policies
 - Enforcement
 - Learning

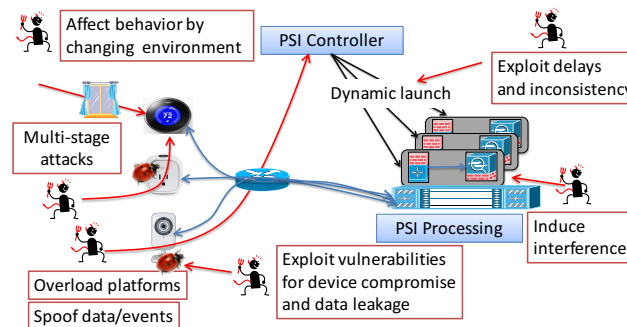


Scientific Impact:

- New formal models and applications unique to IoT
- Novel applications of machine learning for IoT security
- Lightweight gateway system implementation
- New security techniques for automotive networks
- New directions for IoT security and privacy labels

Solution: Software-defined Security

- Policies
 - New FSM-based abstractions
 - New Intent checking algorithms
- Enforcement
 - Lightweight trusted Software-defined network gateway
- Learning:
 - Novel ML techniques for learning context-aware models
 - New mapping algorithms



Broader Impact:

- Open source tools for mapping manufacturing and automotive networks
- Open source network gateway implementation
- Multiple vendor and industry interactions
- Launched IoT initiative at Cylab
- New course content for graduate classes
- Outreach to underrepresented groups (e.g., UNCF academy)
- Testbed for use by other researchers