

U.S. DEPARTMENT OF
ENERGY

Office of
**ENERGY EFFICIENCY &
RENEWABLE ENERGY**

Sensors and Controls R&D Cybersecurity Strategy

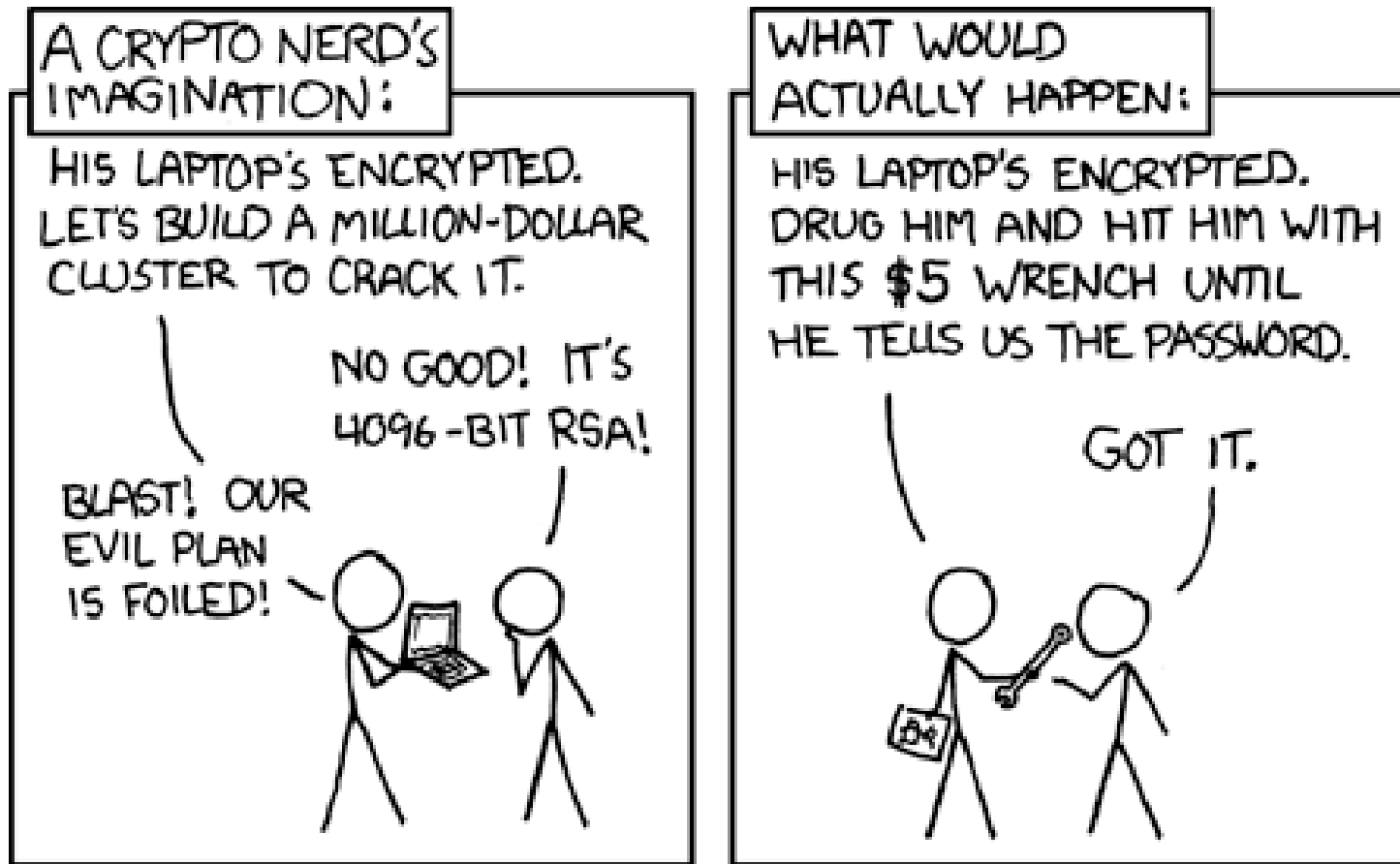
Marina Sofos, Ph.D.

BTO Peer Review

April 16, 2019



Cybersecurity: The \$X million wrench



<https://www.xkcd.com/538/>

Cybersecurity Implications for Buildings

Challenges:

Lack of education/communication between IT/OT personnel, legacy equipment

Attack Scenarios:

Controlling building systems, vector attacks, coordinate attacks, equipment damage, theft of personal/confidential information, configuration changes, unauthorized monitoring/commands, access protection

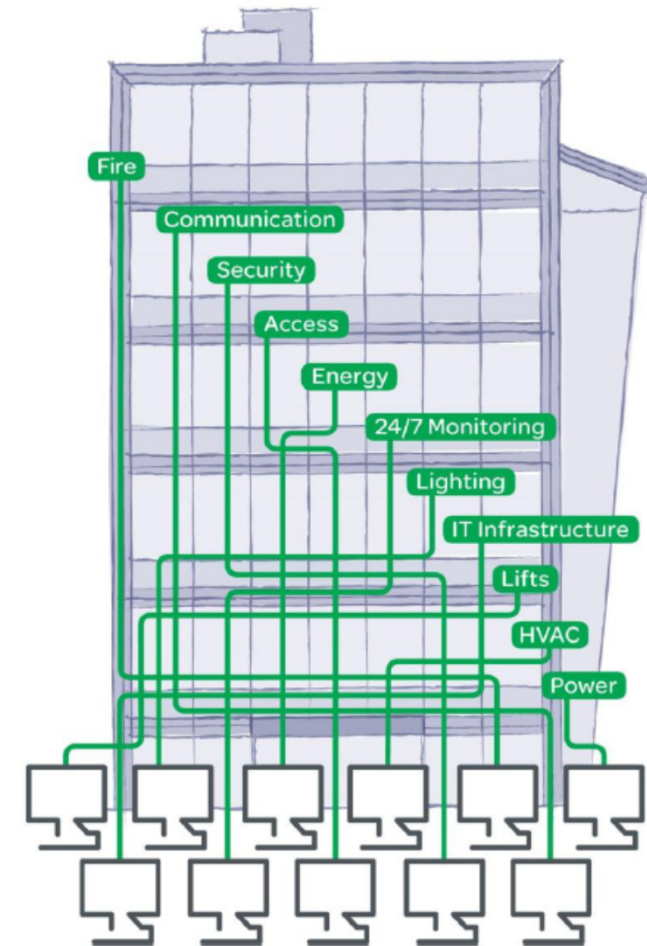
Misconceptions:

Target and Home Depot hacks

Why it Matters to BTO:

Potential energy losses, limit adoption of emerging EE technologies

Multiple systems
(traditional design)



<https://www.sans.org/reading-room/whitepapers/casestudies/case-study-critical-controls-prevented-target-breach-35412>

BTO's Cybersecurity Strategy

(1) Strengthen cybersecurity preparedness

Ensure proper cyber-hygiene – Identify vulnerabilities/threats and current state-of-the-art best practices so that our sensor and control strategies can easily incorporate and update security solutions

(2) Mitigate operational vulnerabilities

Expand automated fault detection and diagnostics work – Identify building operational faults originating from cyber-related attacks to inform control strategy development, understand impact on energy services, and contribute to security solutions in the future

(3) Accelerate cyber resilience R&D of operational technologies

Develop control strategies that optimize against threats and vulnerabilities – Adaptive building control systems for continuity of operations

BTO Cybersecurity Stakeholder Roundtable

- **OBJECTIVES:**

- Understand commercial building owners' perspectives and concerns around cybersecurity
- Identify cybersecurity risks faced by facility managers, building owners, and energy managers
- Inform the 'cyber-consciousness' of how we design and communicate our programs
- Recommend approaches for collaboration with/between building owners to fill in any gaps

- **LOCATION:** Berkeley, CA

- **DATE:** May 23, 2019

- **ATTENDEES:**

Commercial real estate, retail, hospitality, and related sectors who are active and engaged in smart building technology implementation (e.g., SEA Campaign participants, IFMA, BOMA, Better Buildings Challenge partners in commercial real estate, retail, and hospitality, GSA, etc.)



Open Questions:

- How do we balance system security (i.e. hardening) with functionality?
- How do we assess and quantify the prevalence of attacks on connected efficiency equipment and building controls?
- How do we assess and quantify energy losses resulting from cyber-related attacks that compromise operations?