

Cyber-Physical System Security

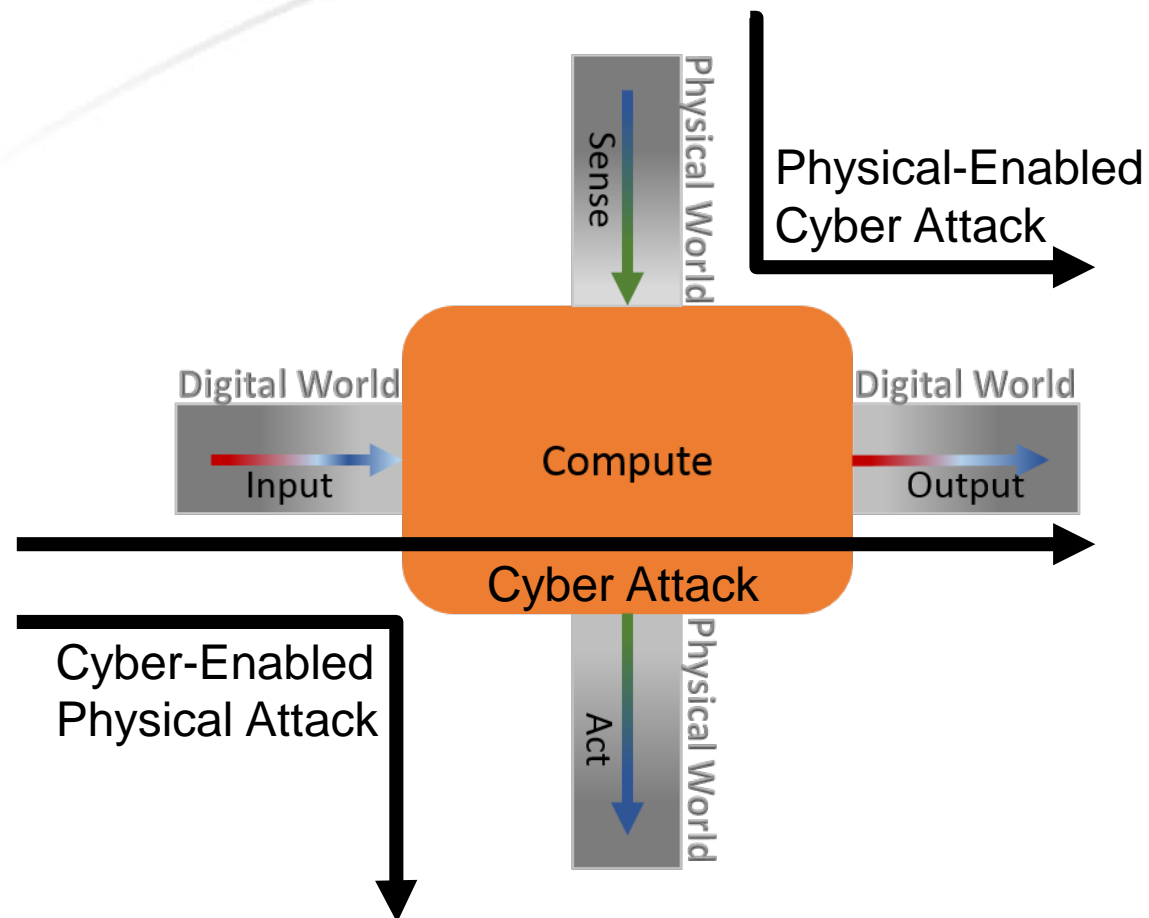
Alia Long

Advanced Research in Cyber Systems (ARCS)

Los Alamos National Laboratory

LA-UR-17-27644

A Cyber-Physical Model

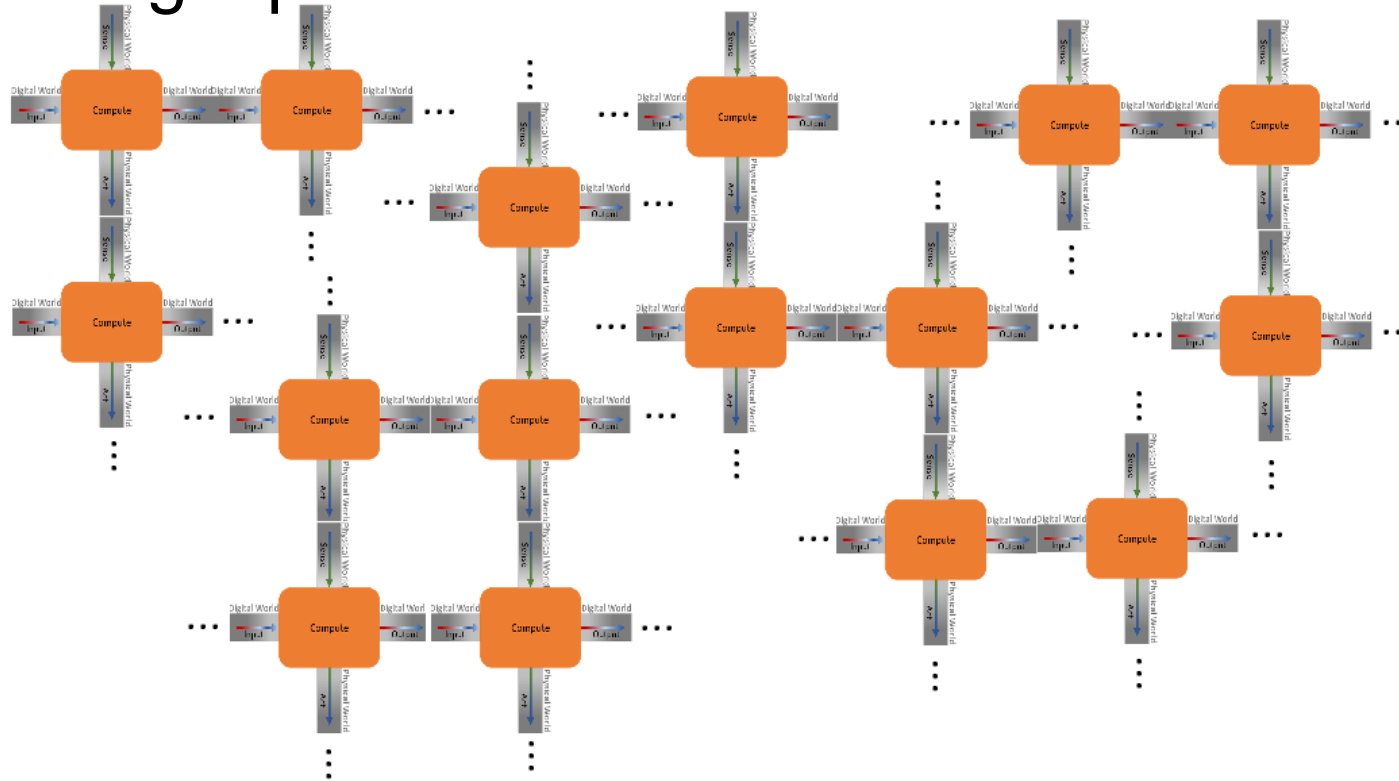


- Cyber Attack
- Cyber-Enabled Physical Attack ¹
- Physical-Enabled Cyber Attack ¹

1) J. Deploy et al., Sandia National Laboratories, "Risk Assessment for Physical and Cyber Attacks on Critical Infrastructures", IEEE Military Communications Conference, 2005

Cyber-Physical System

A network of coupled heterogeneous components in numbers that may expand and contract dynamically, a feedback system incorporating inputs and controls from each domain.



LA-UR-17-27644

Basic Computer Hygiene

Security, like cleanliness, must be a process

Security is well defined for information technology

- Authentication and Encryption
- Defined and Known System
- Least Function
- Least Privilege
- Backups

LA-UR-17-27644

Basic Computer Hygiene in Cyber Physical Systems

The vocabulary and technology are designed for IT security.

- Passwords
- Encryption
- Identification
- Least Privilege
- Technology
- Regulatory
- Remoteness
- Change is costly

LA-UR-17-27644

Human Error

Subject Matter Experts (SME) are not trained in cybersecurity

LA-UR-17-27644

Path Forward

Computer Hygiene

Awareness

- Regular inspection
- Cross functional analysis
- Redundancy

Training

Novel research

Confidentiality, Integrity, and Availability (CIA) of systems must also support the need for stability, controllability, and observability.

Authentication research at LANL, Physical Unclonable Function (PUF)

Questions?

LA-UR-17-27644