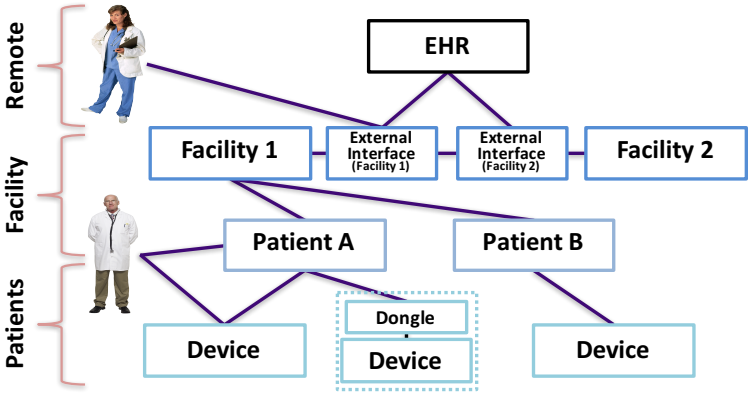
Safety and security for next-generation world-scale real-time medical systems

KANSAS STATE
College of Engineering
Department of Computer Science

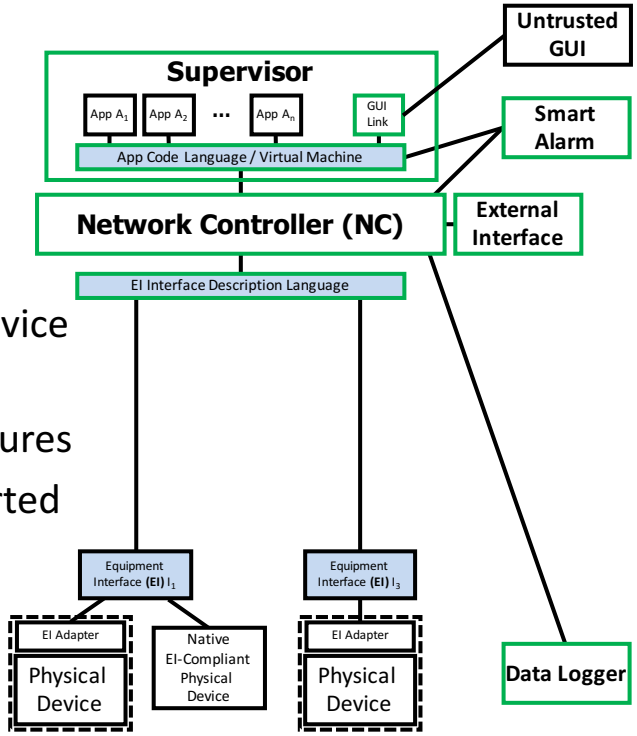
Challenge:

- Cyber-physical (CPS) security is hard
- Coordinating medical devices are particularly challenging if:
  - Composition is ad-hoc
  - Devices are plug-and-play
  - Supply chains are untrusted
  - Devices are not physically tamper-proof



Solution:

- Language for self-descriptive device capabilities and requirements
- Security as native language features
- Security modules are auto-inserted by developer tools



Scientific Impact:

- Authentication and authorization as part of the device description language
- Type-checking of security properties at development time and run time
- Explicitly define how safety depends on security
- Co-design of secure and high-assurance systems

Broader Impact:

- Better software security
- Less reliance on developer security expertise
- Safer and more powerful medical systems through coordination

Awards: 1224007, 1253930
PIs: Vasserman, Andresen, Hatcliff
Contact: Eugene Vasserman <eyv@ksu.edu>