



Dartmouth



3rd ITI Workshop on Dependability and Security: Opportunities and Challenges in Building an Overarching Community

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Coordinated Science Laboratory

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Core Technology: System State Estimation

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"Civilization advances by extending the number of important operations which we can perform without thinking about them."

Alfred North Whitehead

"Build It In" vs "Bolt It On"



Biological Systems ?

Formal methods
New protocols
etc

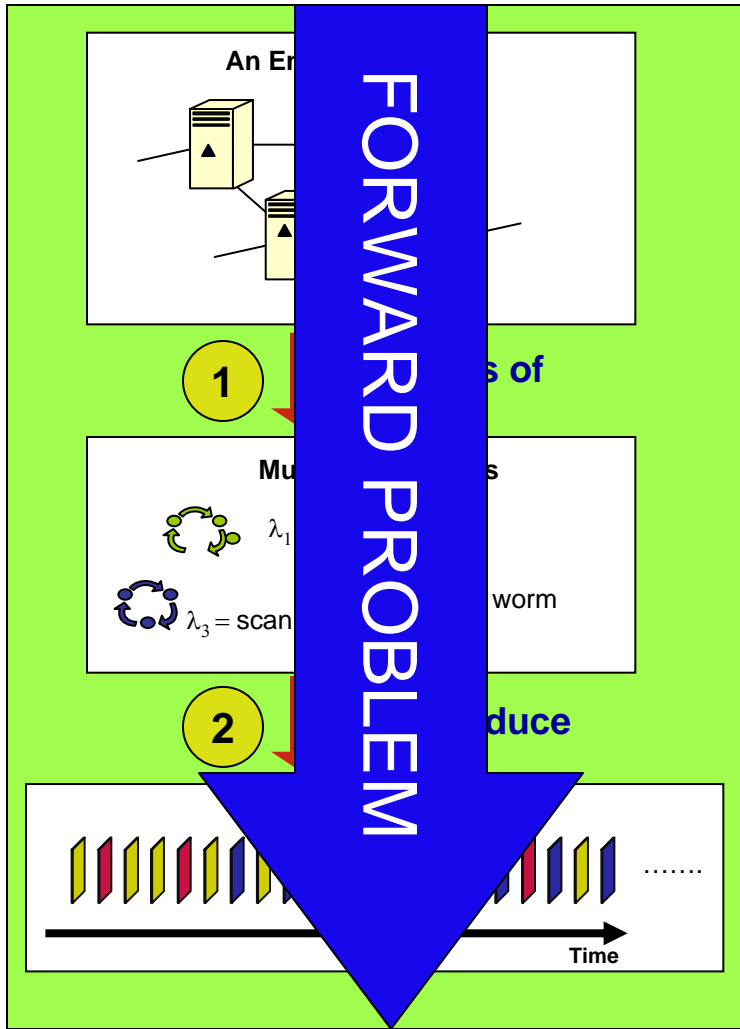
Current practice
IDS
Autonomic computing
etc



Fundamental Question

- Is the "system" in a state that is
 - good
 - marginal
 - bad
- Is it heading towards a bad state?
- The number of possible states of a networked system is astronomical
- The dynamics and state space constantly changes as the configuration changes
- Scalable, real-time state estimation?

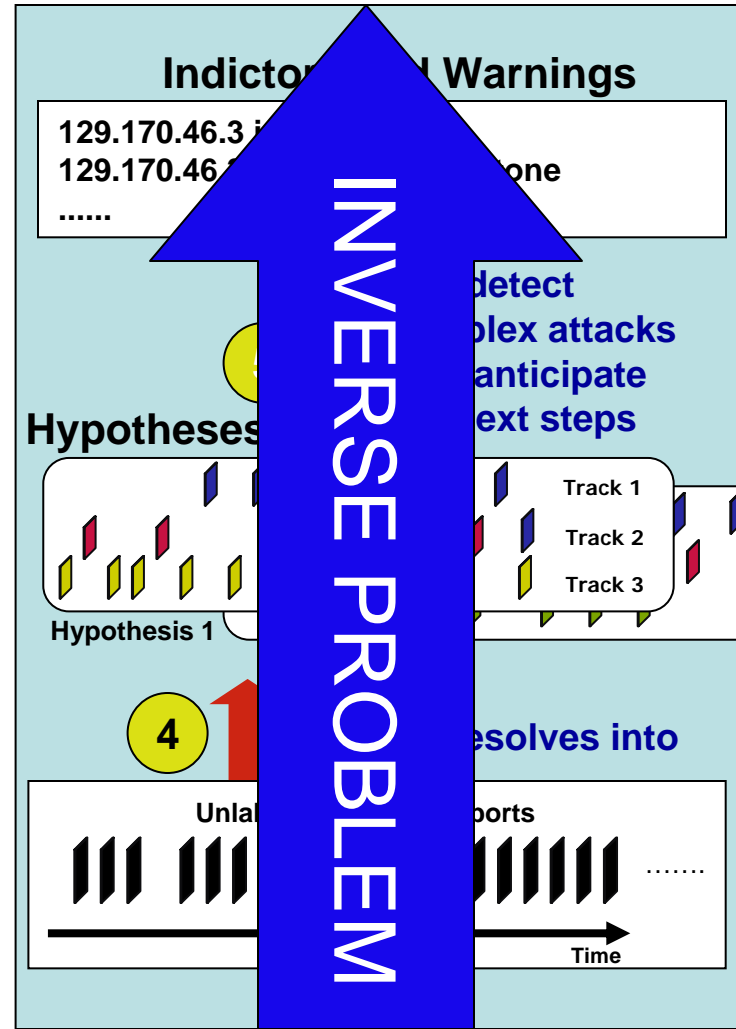
Framework for Process Detection and Process Query Systems (PQS)



Real World

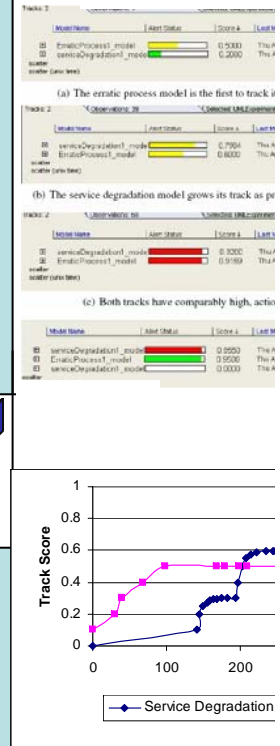
6
← that are used for control

3
→ that are seen as



Process Detection (PQS)

Sample Console



Challenge

- Building systems in which
 - instrumentation is intrinsic and scalable
 - identification of good/bad/marginal states is easy
 - generic state estimation techniques/software work