THE RISK MANAGEMENT ASSOCIATION

Complexity is the new Cyber Adversary

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Technologies

ENTERPRISE RISK ● CREDIT RISK ● MARKET RISK ● OPERATIONAL RISK ● REGULATORY AFFAIRS ● SECURITIES LENDING ● INTERNAL AUDIT

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THE NEW CYBER ADVERSARY

Cyberspace is a rapidly changing, real-time complex system-of-systems

"It surrounds us and penetrates us.
It binds the (enterprise) together"

Obi Wan Kenobe

Enabling exploitable, accidental, even spontaneously combustible, often irreversible, highly impactful breaches

In 2003, "…a tree branch in Ohio started an outage that cascaded across a broad swath from Michigan to New England and Canada."

NY Daily News Aug 2013

In 2009, a Czech Internet router advertised a very long route path that couldn't be handled running legacy software

causing a cascade of events where routers repeatedly shut down and rebooted, saturating the system causing Internet disruptions around the globe

In 2010 Cathay Pacific Flight 780's crew were unable to change the thrust output of the engines.

The complex system of jet fuel supply chain, airport operations and aircraft fuel system conspired to enable small undetectable particles to breach engine performance

WHAT DO THESE HAVE IN COMMON?

There were no nefarious adversarial actors or single failures at play

The complex, heterogeneous nature of the systems themselves led to emergent behaviors

- behaviors that cannot be predicted by examining individual components but are rather produced by the system as a whole

Facilitating "perfect storms" that conspired to enable these catastrophes

THE FINANCIAL SYSTEM IS NO DIFFERENT

"…systemic risk in the financial system is analogous to the reliability risks posed by complex networks encountered in fields such as ecology, epidemiology, biology and engineering"

Andrew Haldane, Executive Director of the Bank of England

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Cyberspace is a real-time, complex system-of systems

Once just a support system, an electronic filing system

Now it's the enterprise's central nervous system, ***its assets***

Rapidly changing and getting more complex
- Runaway internet interconnections; myriad channels
- Mobility, with radios, sensors and controllers
- Mergers & Acquisitions system blending
- Big Data, Cloud, Social Networks
- Internet of Things
- AI

Complex Processes
operating on unstable cyber systems exacerbate systemic risk

Usage of unstable processes presents its own risk…
- Complex Supply Chains and Counterparty Networks
- Too many non-obvious Interlinkages and Interdependencies
- Hastily Integrated Idiosyncratic Events or Conditions

Combined with unstable cyber underpinnings…
- May obfuscate breach sources and adversaries
- Multiplies risk and concomitant consequences

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A Chat: SMEs Explore the Risks and the Remedies

1. Identifying Current and Emerging Vulnerabilities

Tom Walheim, L3Harris

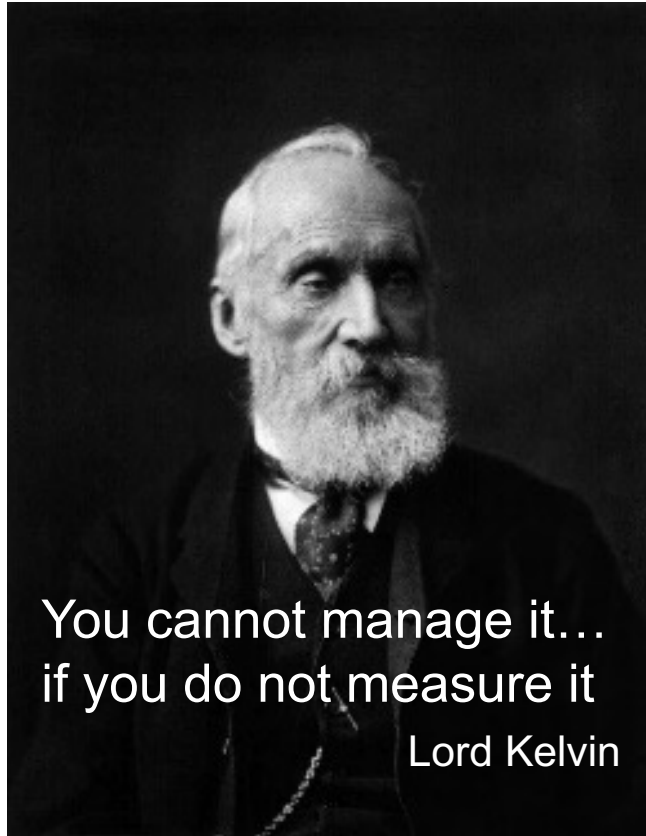2. Quantifying Consequences by System Behavior Modeling

Max Planck, ICASA

3. Achieving Cyber Security and Enterprise Resilience
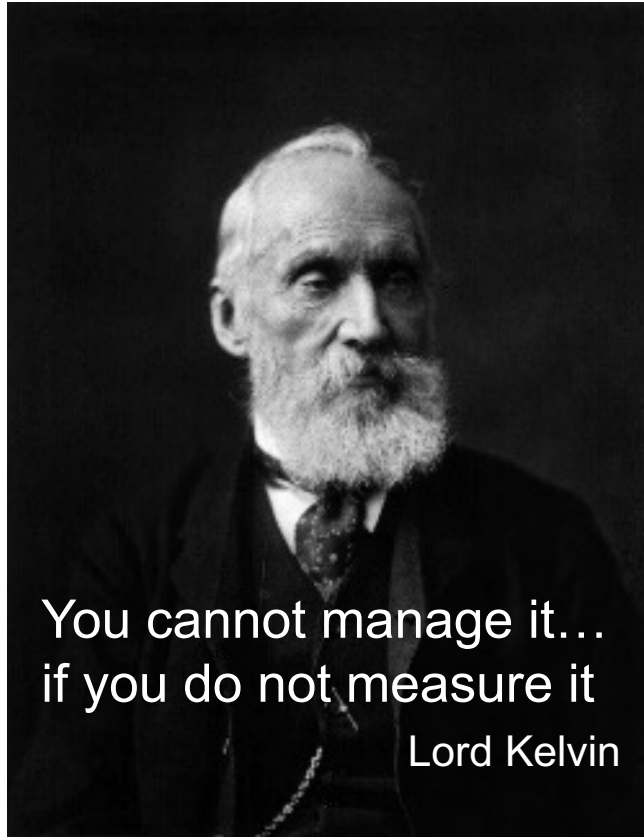
Greg Witte, Huntington Ingalls Industries

SUMMARY

Model behavior to Quantify Consequences

You cannot manage it…
if you do not measure it

Lord Kelvin

Allocate ERM resources commensurate with exposure to achieve resilience, to survive

SUMMARY

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DAILY NEWS

Keep the impact in Ohio

Allocate ERM resources commensurate with exposure to achieve resilience, to survive