Cambridge Centre for Risk Studies

Advisory Board Research Showcase – 13 January 2016

Proactive Cyber Risk Management

Centre for Risk Studies

UNIVERSITY OF CAMBRIDGE
Judge Business School

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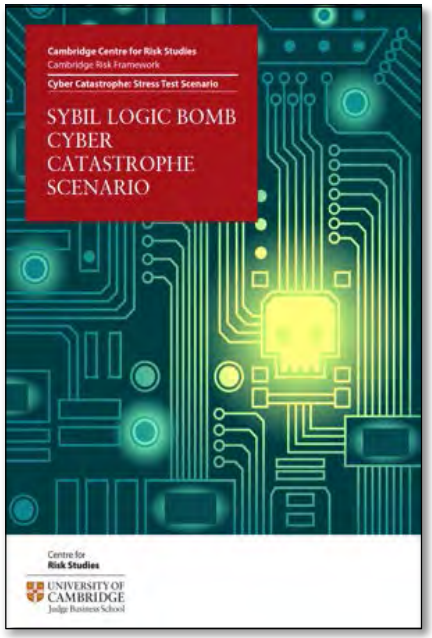
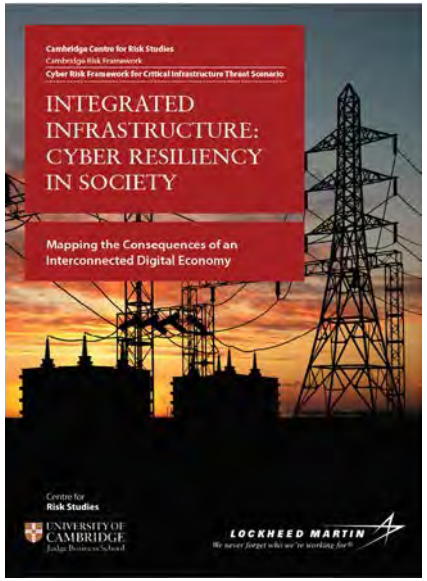
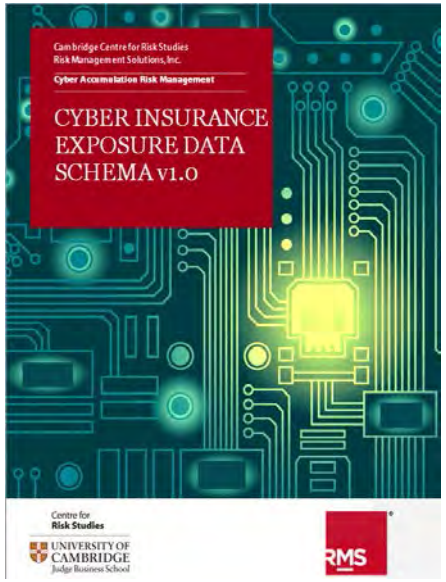
Published Scenarios

- Lockheed Martin
  - UK Distribution Substations
- RMS (Explicit cover)
  - Cloud
  - DDoS
  - Breach
  - FinFraud
  - Ransomware
- Talbot (Silent Cover)
  - Off Shore Oil & Gas
  - Aircraft
  - Electricity Cyber Terrorism
  - On Shore Oil & Gas







We measured the cost of impacts

GDP@Risk

TWHours@Risk

CBI

Event Cancellation

In 2015 we made new models

- Of generation facility infection
- Of cyber-events:
  - Ransomware
  - DDoS
  - Financial Fraud
  - Cloud Compromise
  - Breach
- Of financial impacts
  - I/O analysis of critical infrastructure interdependency

Now we'd like focus on cyber metrics and data pools

We are stewarding an ever changing landscape of internet infrastructures and enterprise machines.

- We need to map and record that change
  - With metrics boards can understand
- That change, changes our vulnerability
- Data Pooling (good role for academia)
- Instead of begging for data:
  - Make it
  - Derive it
  - Listen to the internet
  - AUTOMATE
  - Cyber isn't solved on paper

Our new focus is on gathering/sharing data

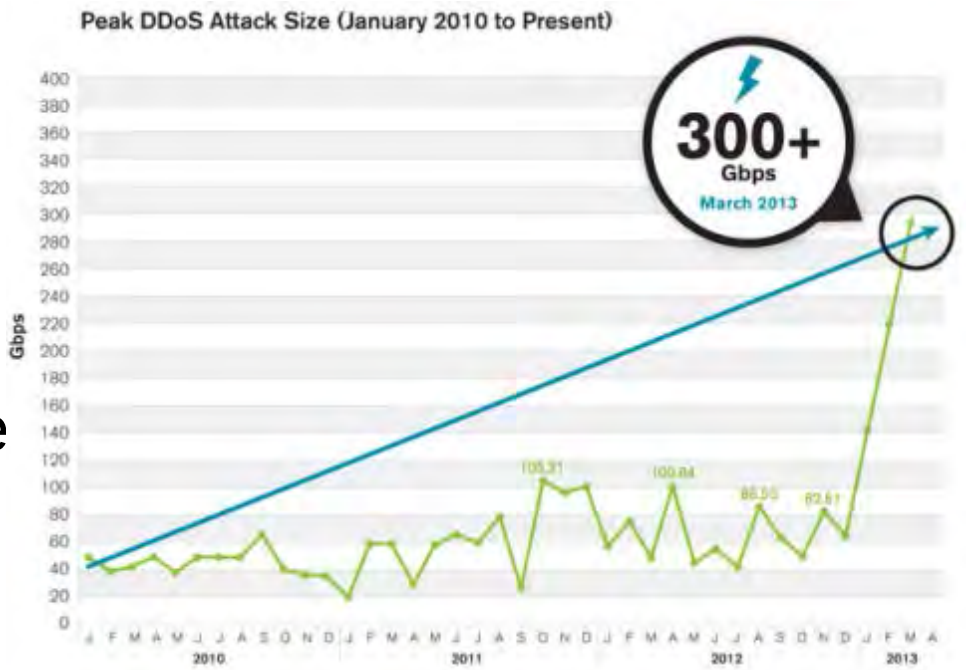
- How big could a breach be?
  - Is a function of data storage
- How big could a DDoS be?
  - Is a function of potential bandwidth and computation
- How big is the ransomware industry
  - Is measurable if we study the malware
- How will we measure these changes over time?

- How do we estimate and find these natural limits?

Passive or Proactive Cyber?

- The models we are currently creating are passive
- This assumes historical precedents are normative
- We know that in cyber historical limits are exceeded almost yearly.

- What if we assume
  - Rectifying actions
  - Incentivising security
  - Collaborative defense

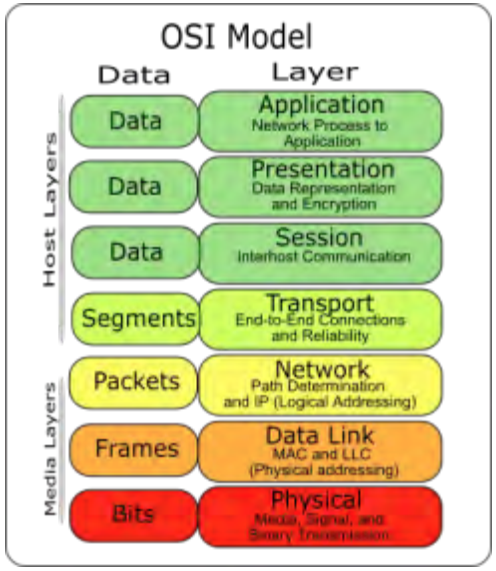


What does Proactive look like?

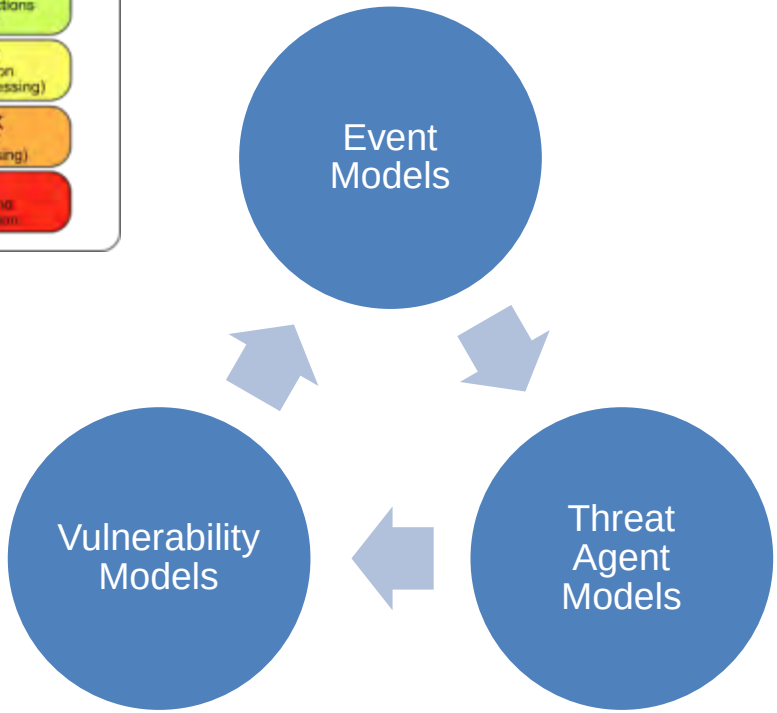
- Lobbying regulatory changes
- Underwriters Labs
- Selection pressure for B2B relations
- Legal pressure on malware hosting
- Limited Software Liability
- Training Underwriters
- Technical measures that scale cheaply
- Indicator of Compromise sharing

All of these approaches are research subject opportunities themselves!

Three models view



- Impact Layers:
  - National
  - Organisational
  - Sectoral
  - Machines/People



Let's talk about the Ukraine incident

- On December 23rd, 2015, around half of the homes in the Ivano-Frankivsk region in Ukraine (population around 1.4 million) were left without electricity for a few hours.
- 3 substations affected, no known physical damage
- The incident is confirmed
- The malware as causal not yet fully in the public domain.
- I will not speculate on attribution, nor should you.

Frequency and Severity of malicious power outages

- If substations have been digitised for 30 years…
- So this might be a 1-in-30 event

- Ukraine uses: 3,957.88 KWH per capita
- 3957.88*6*500,000 = 11,873,640,000 kWh

- Roughly a 1 in 20 year or 1 in 25 year event by that method.

- Only time will tell how frequent they can get.


Questions

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