

2019 ERM Symposium

May 2-3, 2019

Orlando, FL

# Advances in Cyber Risk Modeling

Scott Stransky

# Agenda

- Cyber Insurance Industry Challenges
- Probabilistic Cyber Modeling
- Silent Cyber
- Q&A

# Cyber Insurance Industry Challenges

# Cyber Incidents and Causes of Loss Continue to Evolve

recode

TOPICS ▾ WRITERS ▾ PODCASTS ▾ EVENTS



AMAZON CLOUD COMPUTING

## Amazon's massive AWS outage was caused by human error

One incorrect command and the whole internet suffers.

By Jason Del Rey | @DelRey | Mar 2, 2017, 2:20pm EST

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The New York Times

## Facebook Security Breach Exposes Accounts of 50 Million Users

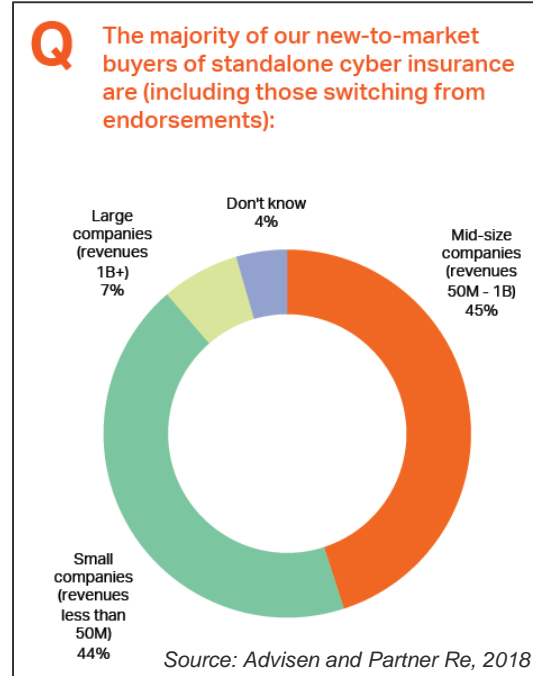
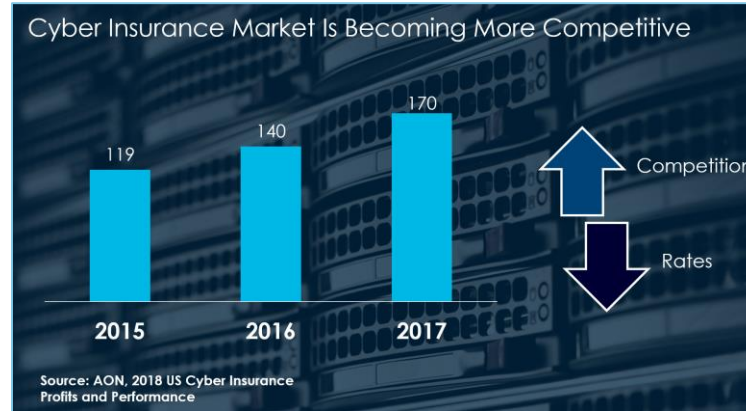
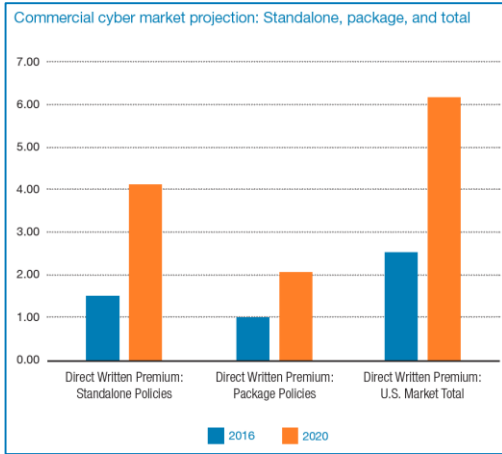


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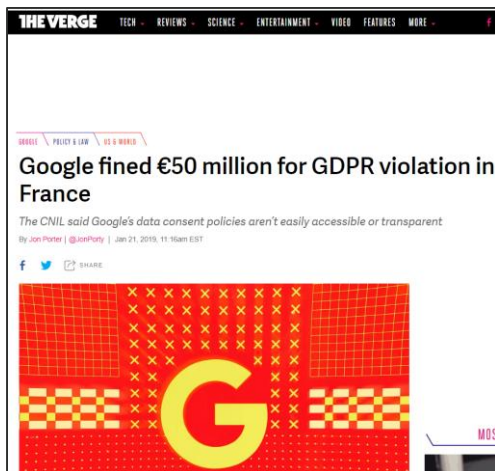
One of the challenges for Facebook's chief executive Mark Zuckerberg is convincing users that the company handles their data responsibly. Josh Edelson/Agence France-Presse — Getty Images



# Cyber Insurance Market Is Growing Fast and Customer Base Is Evolving



# GDPR Fines Are Being Issued



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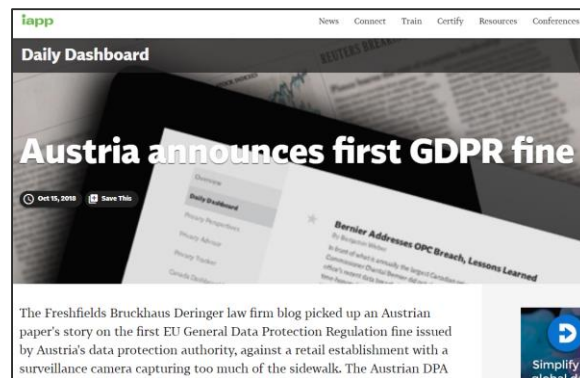
## Google fined €50 million for GDPR violation in France

The CNIL said Google's data consent policies aren't easily accessible or transparent

By Jon Porter | @JonPorter | Jan 21, 2019, 11:16am EST

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MOS



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## Daily Dashboard

### Austria announces first GDPR fine

Oct 15, 2018 Save This

Bernier Addresses OPC Breach, Lessons Learned

The Freshfields Bruckhaus Deringer law firm blog picked up an Austrian paper's story on the first EU General Data Protection Regulation fine issued by Austria's data protection authority, against a retail establishment with a surveillance camera capturing too much of the sidewalk. The Austrian DPA

Simplify c  
ninja4dat



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## Germany's first fine under the GDPR offers enforcement insights

Nov 21, 2018 Save This

Oliver Schmidt

NYMITY Understanding Comj with the LGPD. Deal New Brazilian Private

On Nov. 21, the State Commissioner for Data Protection and Freedom of Information Baden-Wuerttemberg (LfDI) imposed the first fine under the GDPR in Germany. The fine was imposed on a social media company for a violation of its data security obligations. This is not the first GDPR-related

JAN 23 2019 @ 11 AM EST



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## First GDPR fine in Portugal issued against hospital for three violations

Jan 3, 2019 Save This

Dr. Ana Menezes Monteiro, CIPP/E, CIPM, CIPT, FIP

Centro Hospitalar Barreiro Montijo has been fined 400,000 euros for violating the General Data Protection Regulation.

DPORG EXCEL IN DATA MANAGE A step-by-step guide to stay in control of...

# Probabilistic Cyber Modeling

# Cyber Risk Modeling Requires Three Key Pillars



**Probabilistic and  
Deterministic**



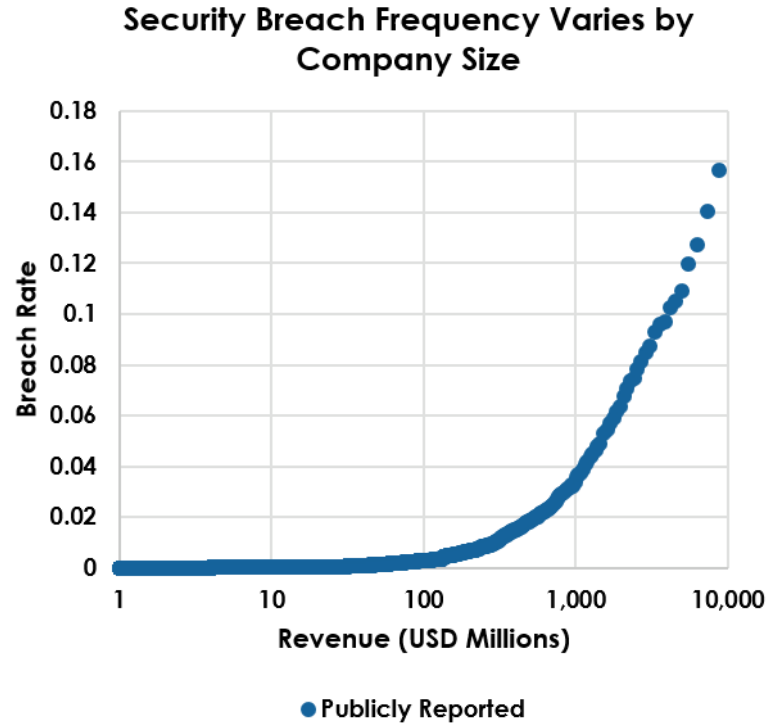
**Cyber Exposure  
Database**



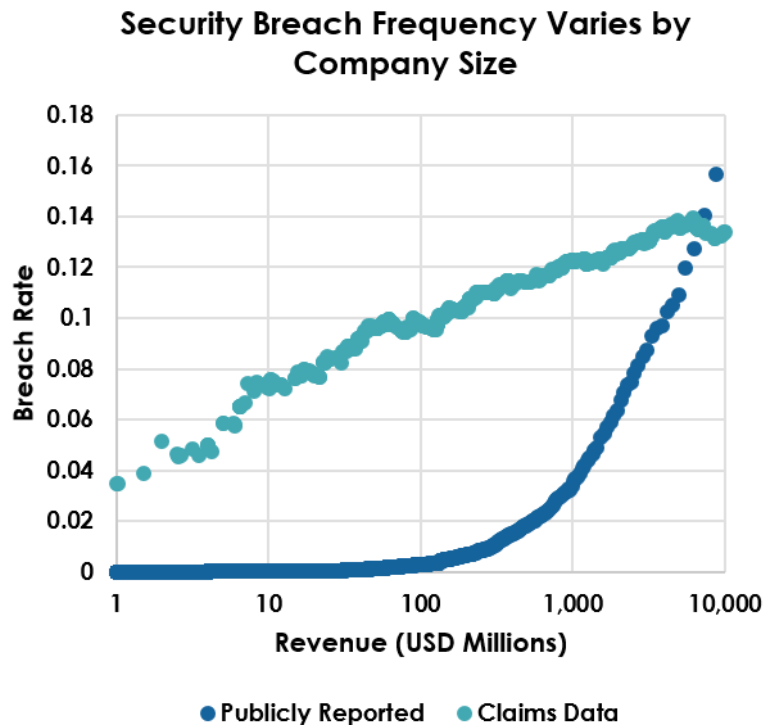
**Transparency  
and Flexibility**



# Bias in Reported Data Requires Adjustment Using Claims



# Bias in Reported Data Requires Adjustment Using Claims



# Machine Learning Identifies Drivers of Data Compromise



**Industry**



**Revenue**



**Exploited  
Applications**



**Patching  
Cadence**



**File Sharing**

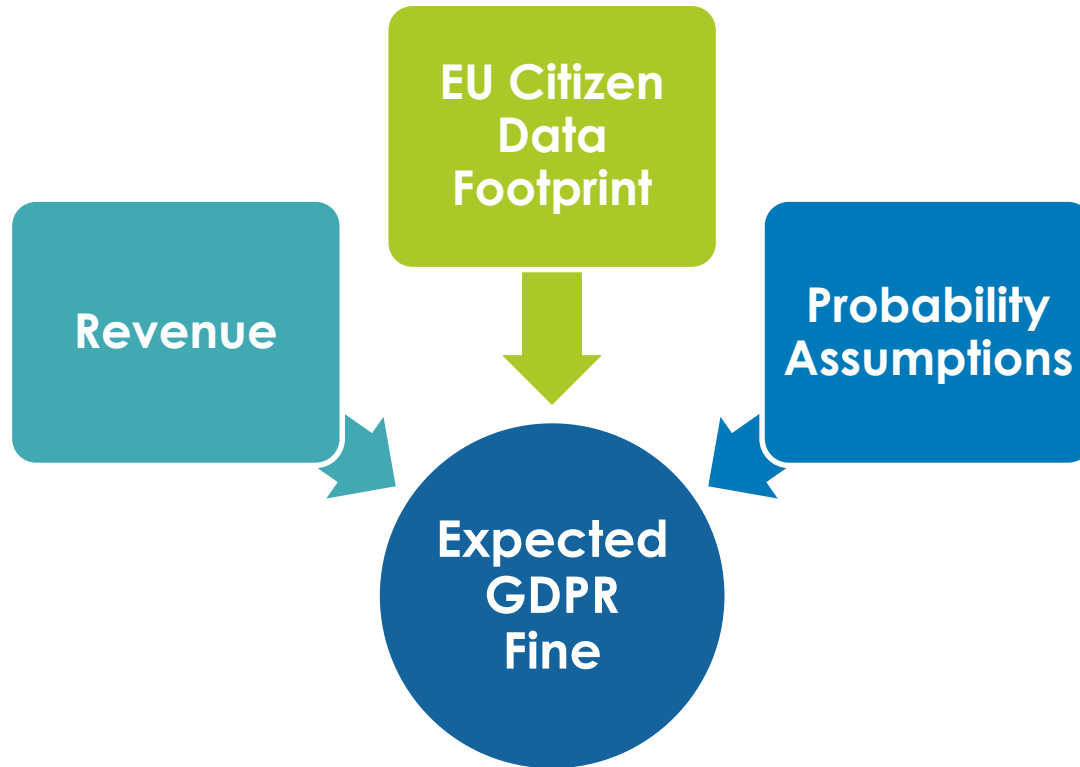


**Botnet  
Infections**



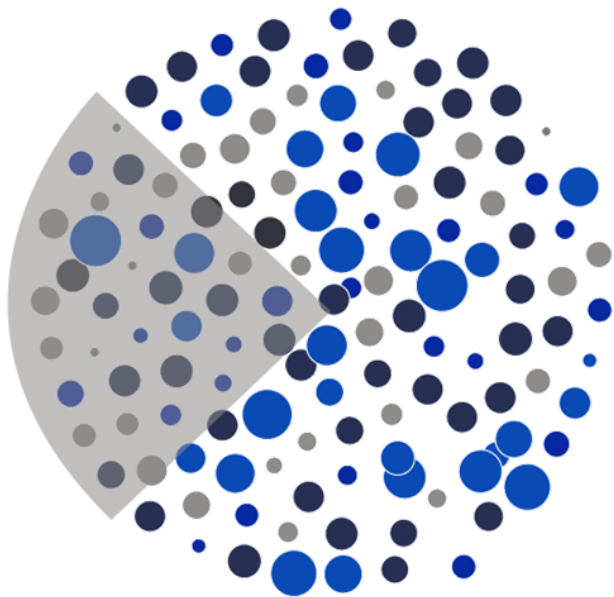
**Spam  
Propagation**

# GDPR Fines Expected When Data Compromise Occurs



# Robust Risk Management Includes Several Approaches

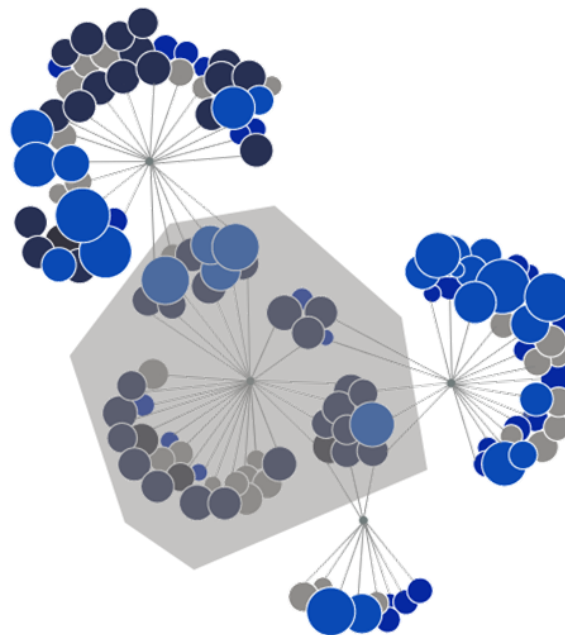
## Market Share Approach



Cloud Vendor X has 25% Market Share

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## Detailed Accumulation Approach



Cloud Vendor X is used by these *specific* 33% of companies

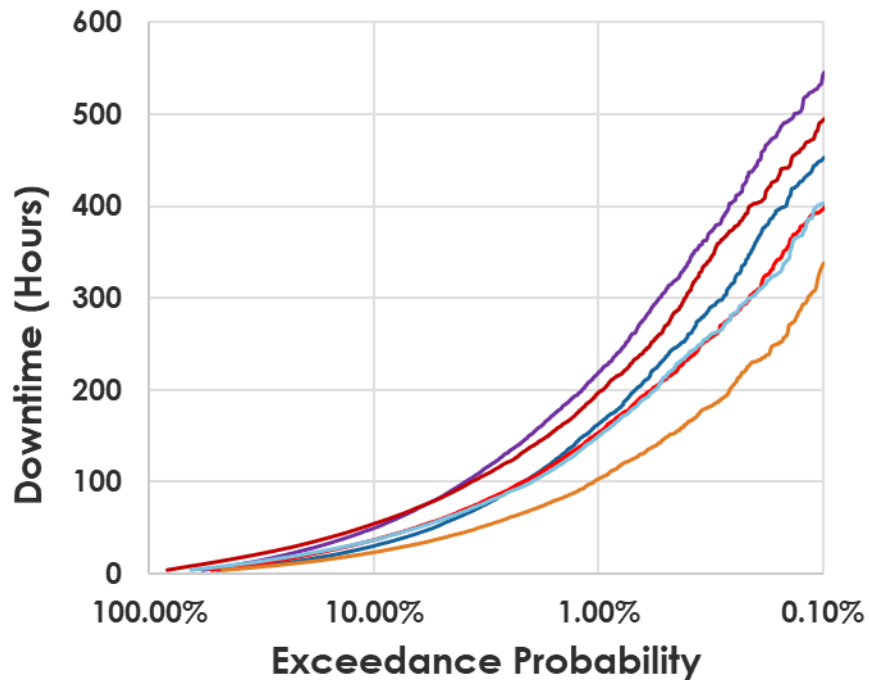
CONFIDENTIAL

13

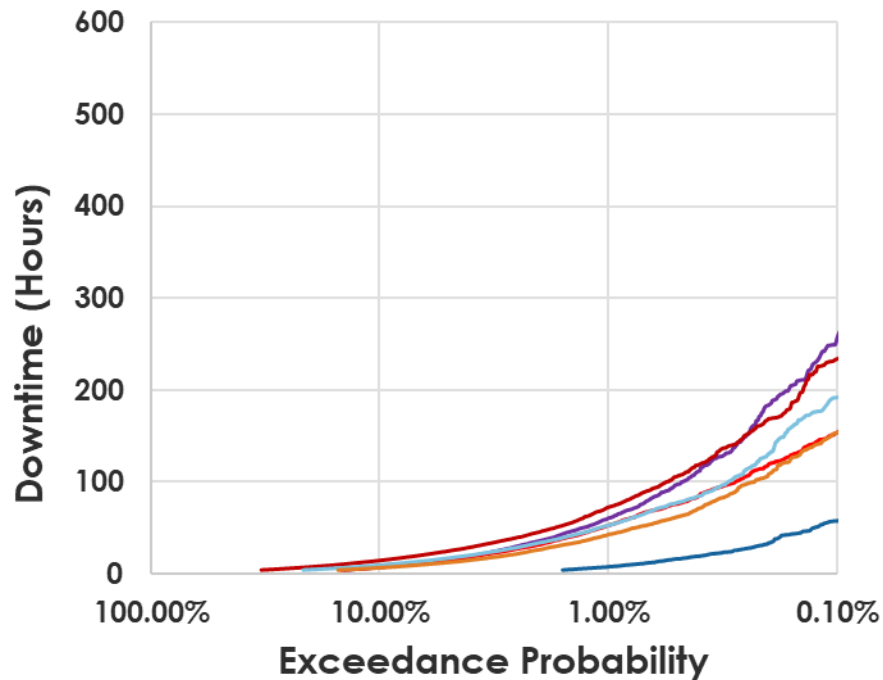


# Not All Cloud Providers Are Equally at Risk

## EP Curve: Single Region Incident



## EP Curve: Global Incident



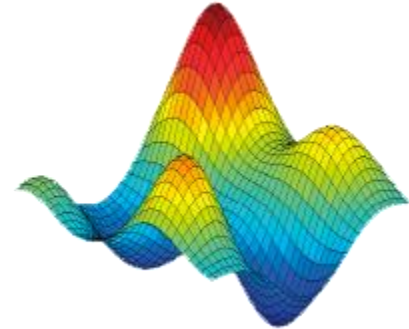
# (Re)Insurers and Brokers Leverage Cyber Risk Modeling Across a Number of Use Cases



**Underwriting  
and Pricing**

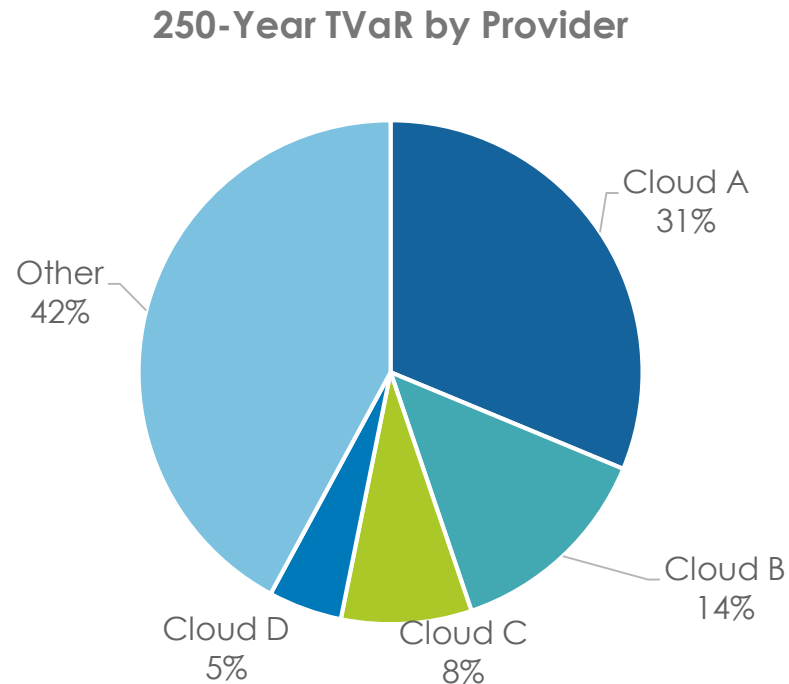
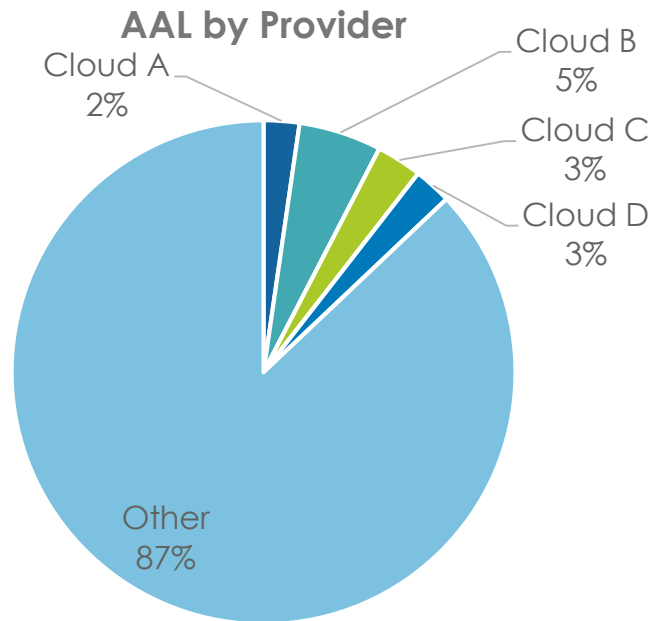


**Portfolio  
Management**



**Risk Transfer**

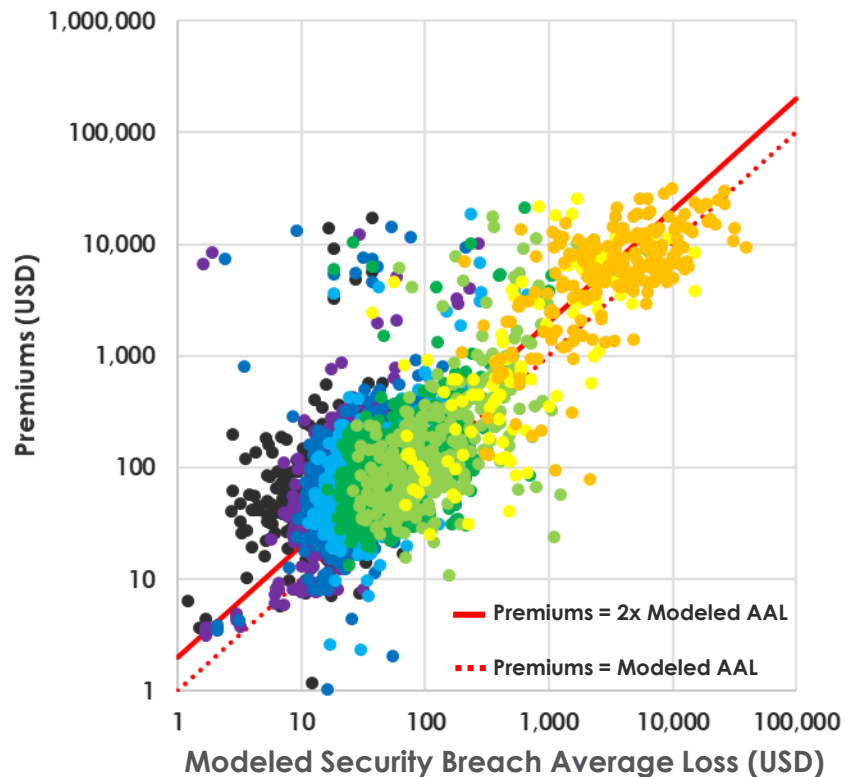
# Business Interruption Losses by Cloud Provider Reveal Insights About a Portfolio





# Cyber Risk Policies Have Been Mispriced

## Comparison of Insurance Pricing vs Model Estimates



# Risk Transfer Based on Outage Duration

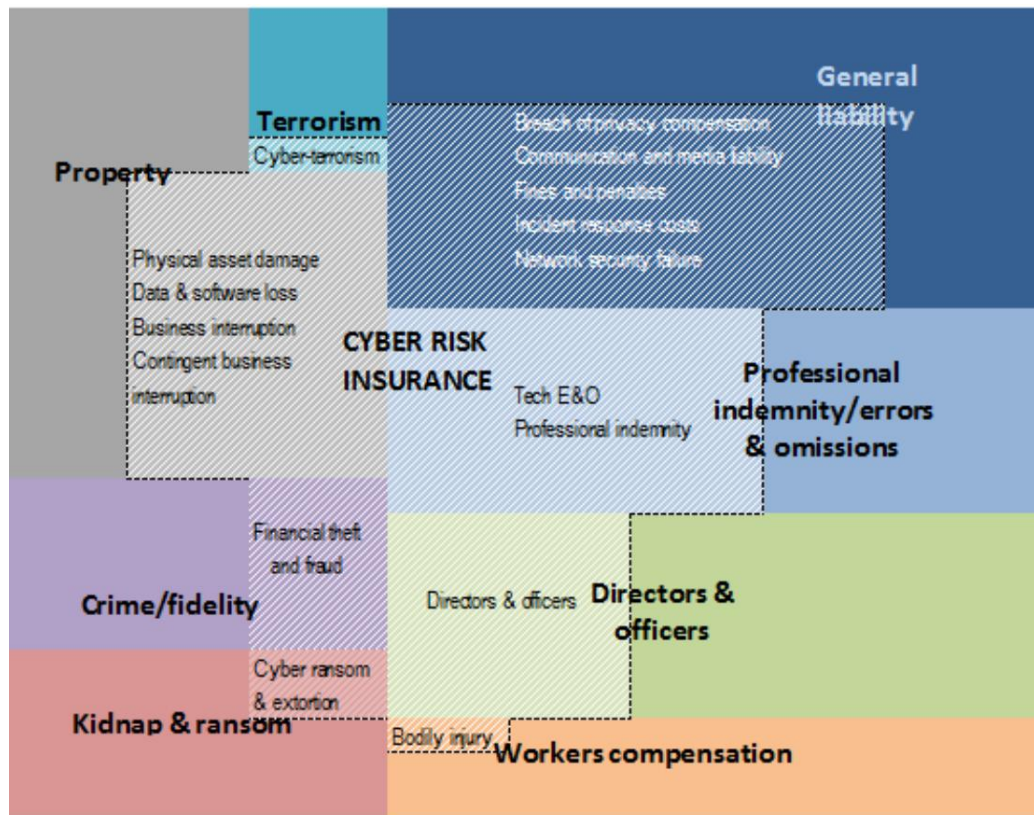
## Aggregate EP Curves



# Silent Cyber Overview



# What Is Silent Cyber?

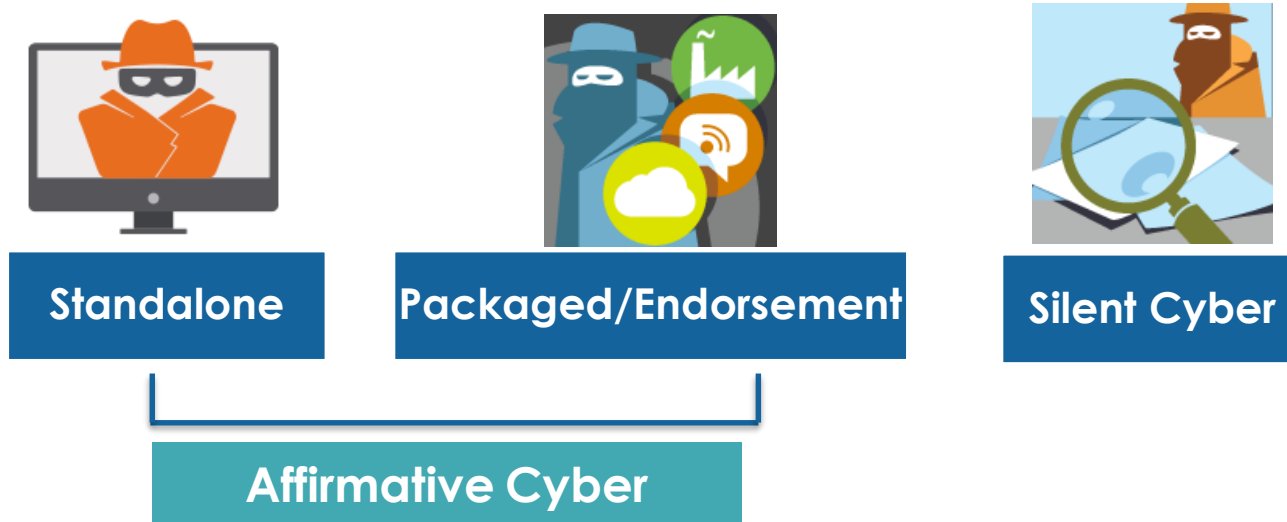


Situations where potential cyber exposures are neither explicitly included or excluded by an insurance policy

Cyber claims can be made across various LOBs

Source: OECD

# A Year Ago, There Were 3 Categories of Cyber Risk



# Today, Some Would Argue There Are 4!



Standalone



Packaged/Endorsement



Non-Cyber Policy?



Silent Cyber

Affirmative Cyber

# What Types of Modeling are Being Done for Silent Cyber?



**Offshore Energy**



**Office Buildings**



**Auto**



**D&O**



**NotPetya-like Events**



# Cyber Modeling Enables Business Growth



Diversify your portfolio with more confidence



Optimize your cyber underwriting



Stay ahead of the evolving cyber risk landscape

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**Cyber Risk**

**In Focus**  
Risk, modeling, and industry buzz.

ABOUT SOLUTIONS AIR HOME

Could the Next Internet Apocalypse Come Soon?  
October 16, 2018

It's possible that tens of thousands of websites across the world could be labeled as unsafe this October, potentially leading to business interruptions losses.

Author(s): [Gian Calvesbert](#)  
Categories: [Cyber Risk](#)

What's the Deal With Systemic Cyber Risk?  
June 21, 2018

Insurers worry that a single cyber incident could trigger multiple claims, possibly at a catastrophic level. So, what's the deal with systemic cyber risk? What causes it and how do you measure it?

Author(s): [Gian Calvesbert](#)  
Categories: [Cyber Risk](#)

The Cyber Data Challenge

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# Questions?