Cambridge Judge Business School

Cambridge Centre for Risk Studies 2018 Risk Summit

CYBER TERRORISM THREAT INTELLIGENCE AND LOSS MODELLING

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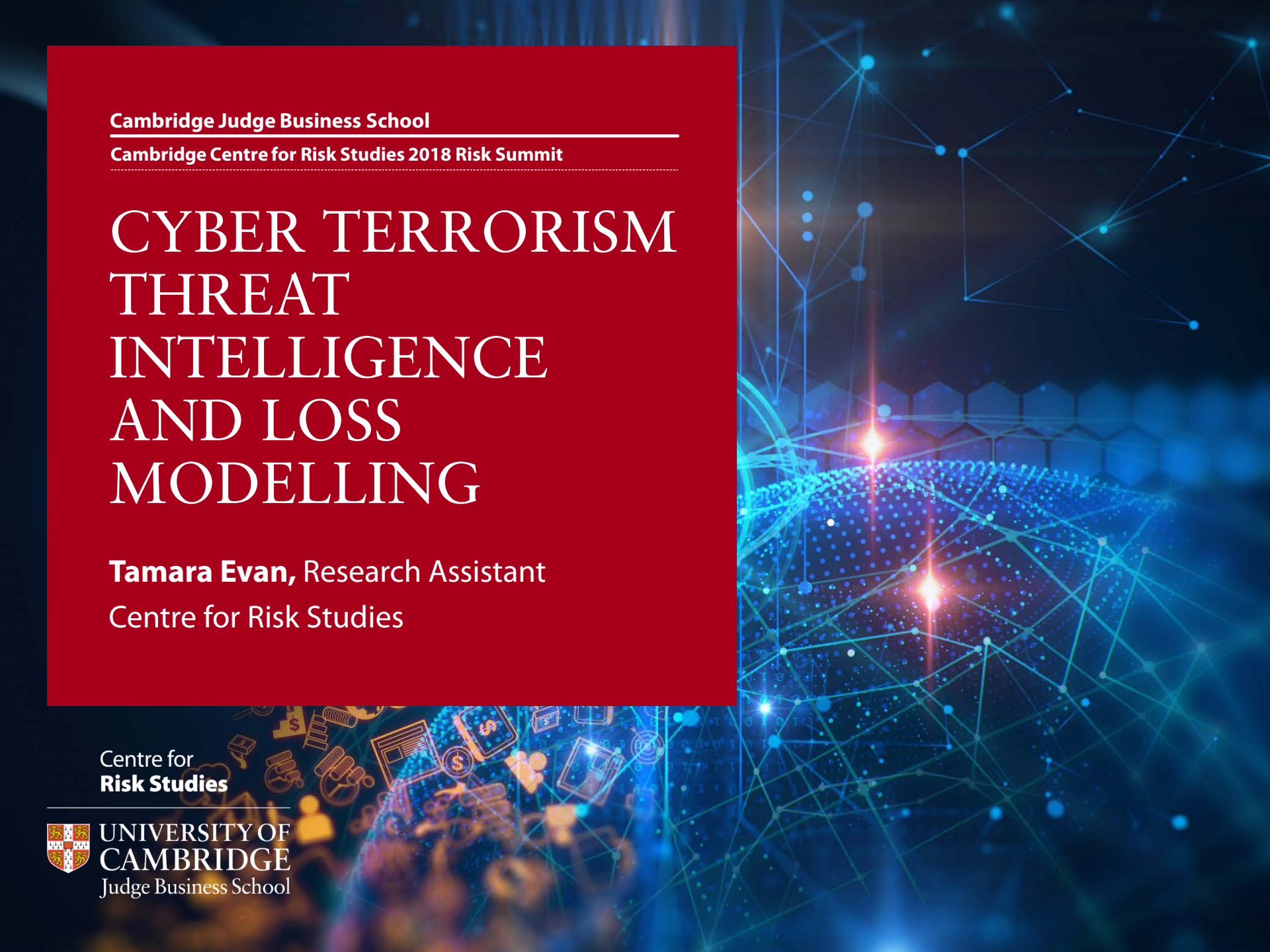
Centre for Risk Studies



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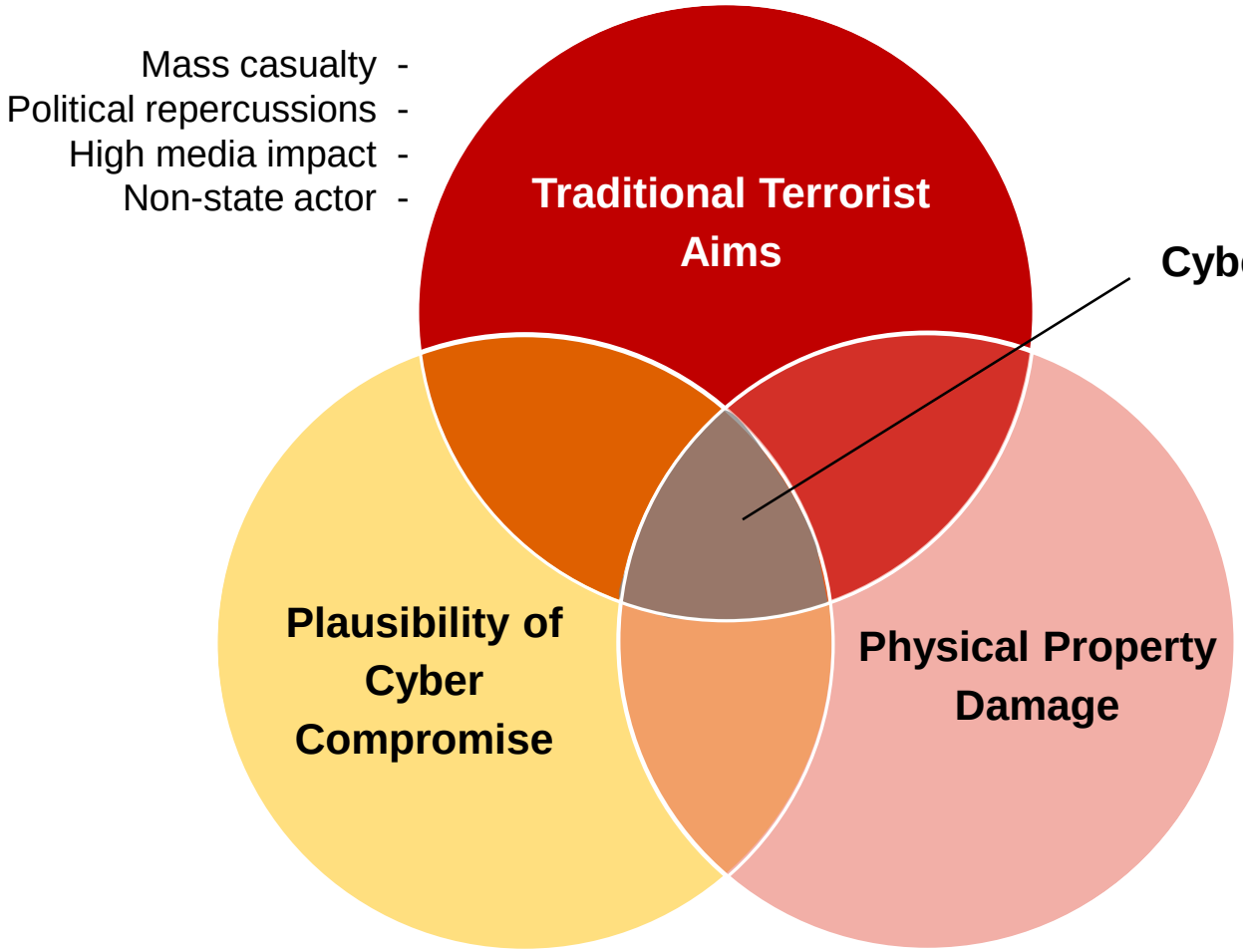
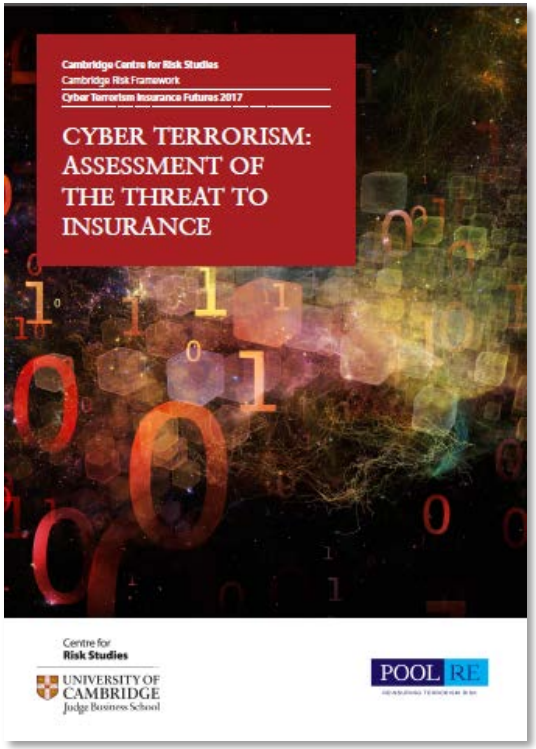
Defining cyber terrorism



Pool Re extends cover for losses from cyber terrorism



- 2016 -2017 Cyber Terrorism Insurance Futures methodology
  - Expert revision schemes for proposed scenario long-lists
  - Monitoring capabilities of terrorist threat groups
    - Quarterly updates on threat development and thematic changes
  - Creation of low-probability cyber terrorism scenarios
  - In-depth study of key loss processes
  - Treasury granted permission to Pool Re's extension of retrocession cover for losses from acts of cyber terror in August 2017

- 2017 Report: **Cyber Terrorism: Assessment of the Threat to Insurance,** launched November 2017

November 28 Report and Schema Launch

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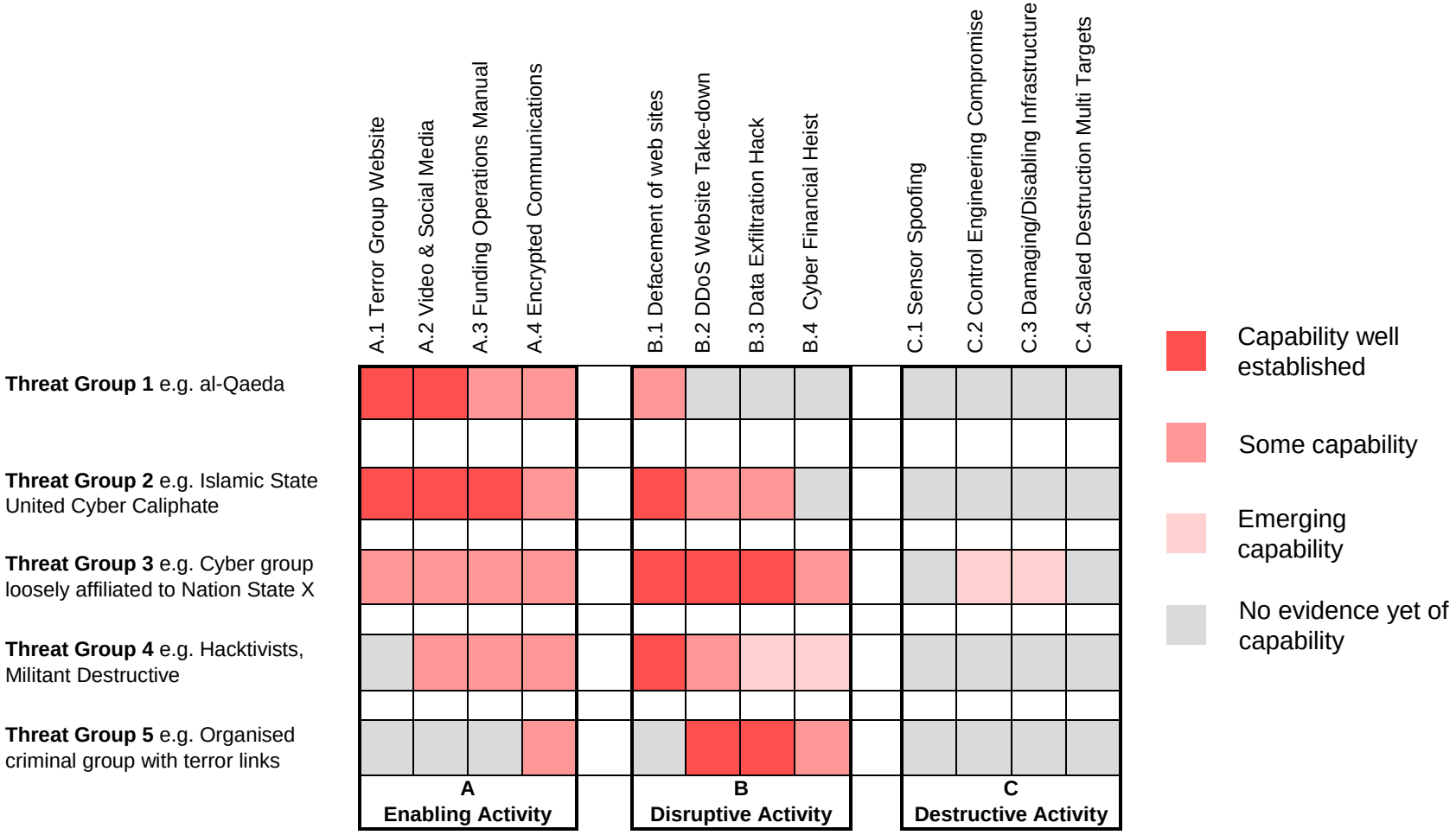
The cyber terrorism threat in 2018

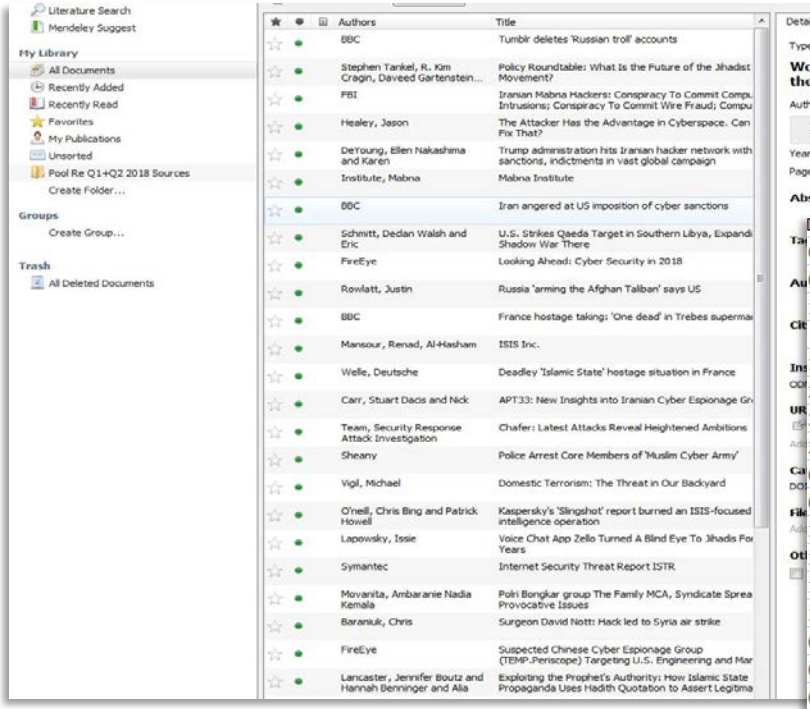
- To date, there have been no known instances of cyber terrorism fitting this definition

- There is little evidence to suggest that current terrorist groups have invested significant time or capital into the development of sophisticated physical cyber attacks
- Several groups have proclaimed their intentions to attack the West digitally
    - Statements of intent do not necessarily suggest capability
- Given the generational lifetime of dominant terrorist threats, we would expect that any imminent development of destructive cyber capabilities would be carried out by currently active group
    - The most relevant groups pose a low-likelihood of inflicting severe physical damage through digital means

Tracking capability across cyber actor groups



Threat assessment and structure analytical techniques



Date	Type	Details	Attribution	Actor	Class
06/07/2017	Malware	Multiple Western ICS Breaches	Dragonfly 2.0	Nation State APT	Destructive
07/07/2017	Malware	Western ICS in Energy Sector	Most Likely Russian APT	Nation State APT	Destructive
15/07/2017	Malware	British ICS in Energy Sector	Most Likely Russian APT	Nation State APT	Destructive
16-Jul-17	Malware	South Carolina Election Breaches	Most Likely Russian APT	Nation State APT	Disruptive
17/07/2017	Malware	UK Energy Sector GCHQ-ICS	Most Likely Russian APT	Nation State APT	Destructive
27/07/2017	Malware/	DarkWeb Marketplace Claiming T	Cyber Criminal	Cyber Criminals	Destructive
27/07/2017	Malware	Macron Campain Breach	Most Likely Russian APT	Nation State APT	Disruptive
28/07/2017	Exploits	WikiLeaks Vault 7 Dump	Hacktivists or APT	Hacktivist	Disruptive
01/08/2017	Destructiv	IsraBye Diskwiper That Functions	Cyber Terrorists/Hacktivis	Cyber Terrorists	Destructive
07/08/2017	Defaceme	Defacements Advocating The Ove	The Binary Guards	Cyber Terrorists	Disruptive
12/08/2017	DDoS	Coordinated Attack on City of Cha	Anon	Hacktivists	Disruptive
15/08/2017	Brut Force	Brute Force Attack on Scottish Par	Likely Nation State APT	Nation State APT	Disruptive
18/08/2017	Data Exfil	Hacktivists Release Info on GOP S	Anon	Hacktivists	Disruptive
18/08/2017	Data Exfil	1.2 Million NHS Records Stolen (D	Anon	Hacktivists	Disruptive
02/09/2017	Manipulat	Australian 1st Responder Comms	Pirate Broadcaster ?	Hacktivists	Disruptive
06/09/2017	Malware	Symantec Finds APTS in Western	Most Likely Russian APT	Nation State APT	Destructive
07/09/2017	Data Exfil	Equifax 143 Million Details Exfil	Cyber Criminal Organisati	Cyber Criminals	Disruptive
27/09/2017	DDoS	Danish Ministries Dealing With In	Cyber Terrorists/ Hacktivis	Cyber Terrorists	Disruptive
05/10/2017	Data Exfill	NSA Contractor Has NSA Exploits S	Most Likely Russian APT	Nation State APT	Destructive
10/10/2017	Malware	North Korea Penetrates US ICS/Pc	North Korean APT	Nation State APT	Destructive
10/10/2017	Data Exfil	North Korean APT Steals OP Plan S	North Korean APT	Nation State APT	Disruptive
11/10/2017	DDoS	Targeted DDoS Attack Against Swe	Most Likely Russian APT	Nation State APT	Destructive
12/10/2017	DDoS	Targeted DDoS Attack Against 3rd	Most Likely Russian APT	Nation State APT	Destructive
20/10/2017	Malware	APT Conducting R&D In Energy An	Likely Nation State APT	Nation State APT	Destructive
24/10/2017	Malware	Bad Rabbit Ransomware, Based O	Most Likely Russian APT	Nation State APT	Destructive
30/10/2017	Malware	Cybercriminal Group Targeting Int	Cyber Criminals	Cyber Criminals	Disruptive
31/10/2017	Ddos? Del	Hacktivists Bring Down Several Sp	Anonymous	Hacktivists	Disruptive
06/11/2017	Defaceme	Team System Dz Multiple Defacer	Team System Dz	Cyber Terrorists	Disruptive
14/12/2017	Malware	TRITON Malware Attacks ICS and S	Likely Nation State APT	Nation State APT	Destructive
Hacktivists	Destructive	Cyber Criminals			
Nation State APT	Disruptive	Cyber Terrorists			

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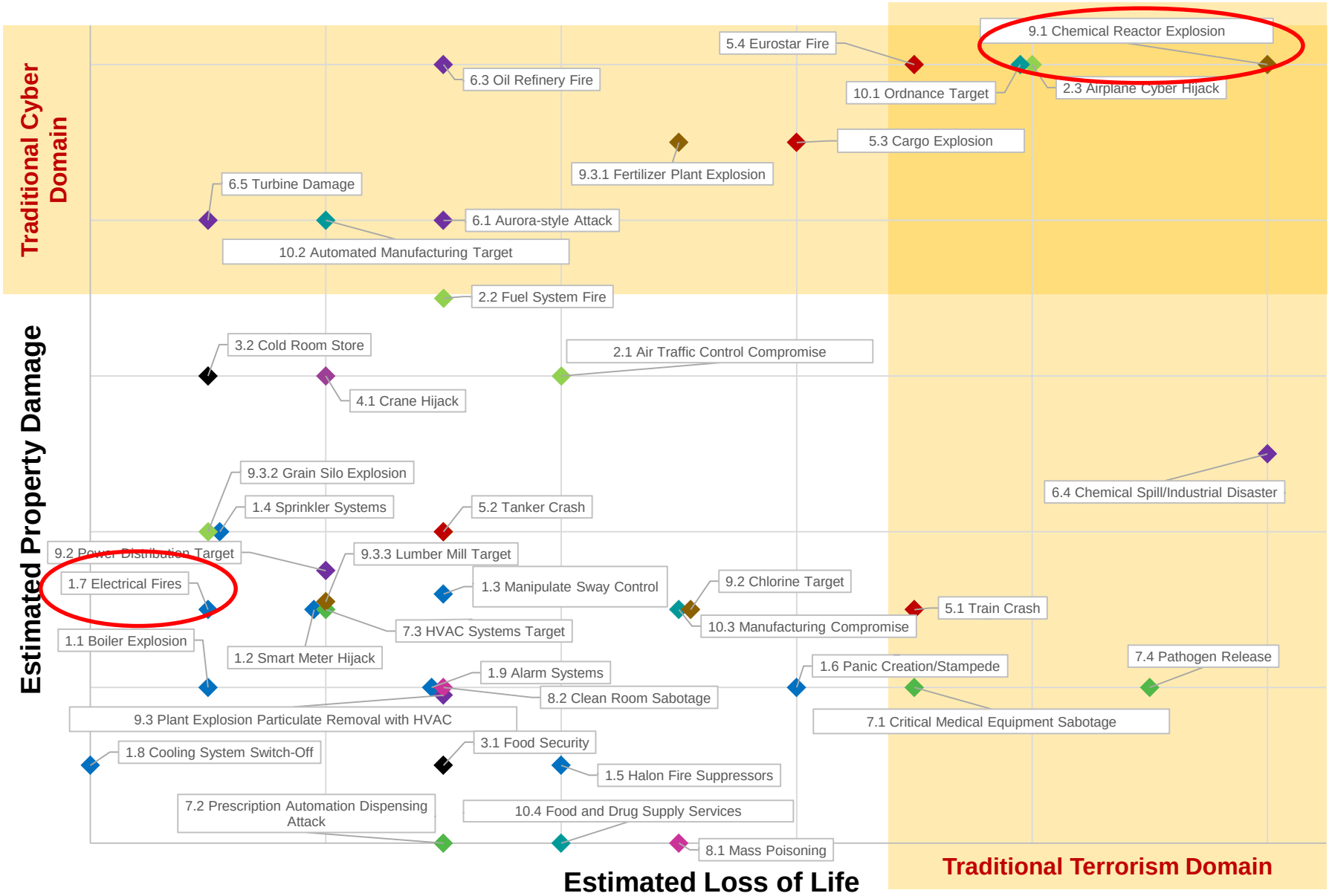
Scenario planning 2016-present



Scenario: Cyber-Induced Explosion in a Major Chemical Processing Facility

‘Fuel bomb’ leak at major chemical facility
(Chemical reactor explosion)

	Mortality Rate	Physical Damage	Media Impact	Plausibility	Scalability	Direct BI Potential	Overall Economic Impact
9.1 Chemical Reactor Explosion	10	10	10	9	2	3	1

	Standard Scenario (S1)	Scenario Variant (S2)	Extreme Variant (X1)
Variant Profile Description	A significant fire causes physical damage at the facility	A major explosion at the facility with blast radius with 2km debris scatter	Chemical explosion with blast radius impacts key facility operations with 2km debris scatter
Loss of Affected Site (Property)	50%	50%	Write-off (100%)
Loss of Affected Site (Contents)	50%	50%	50%
Surrounding Area of Business Affected	Facility only	2km radius	2km radius
Total Loss Value	**£ 507m**	**£ 625m**	**£ 1,132m**

Scenario: Cyber-Induced Fires in Commercial Office Buildings

Cyber-Induced Fires in Commercial Office Buildings

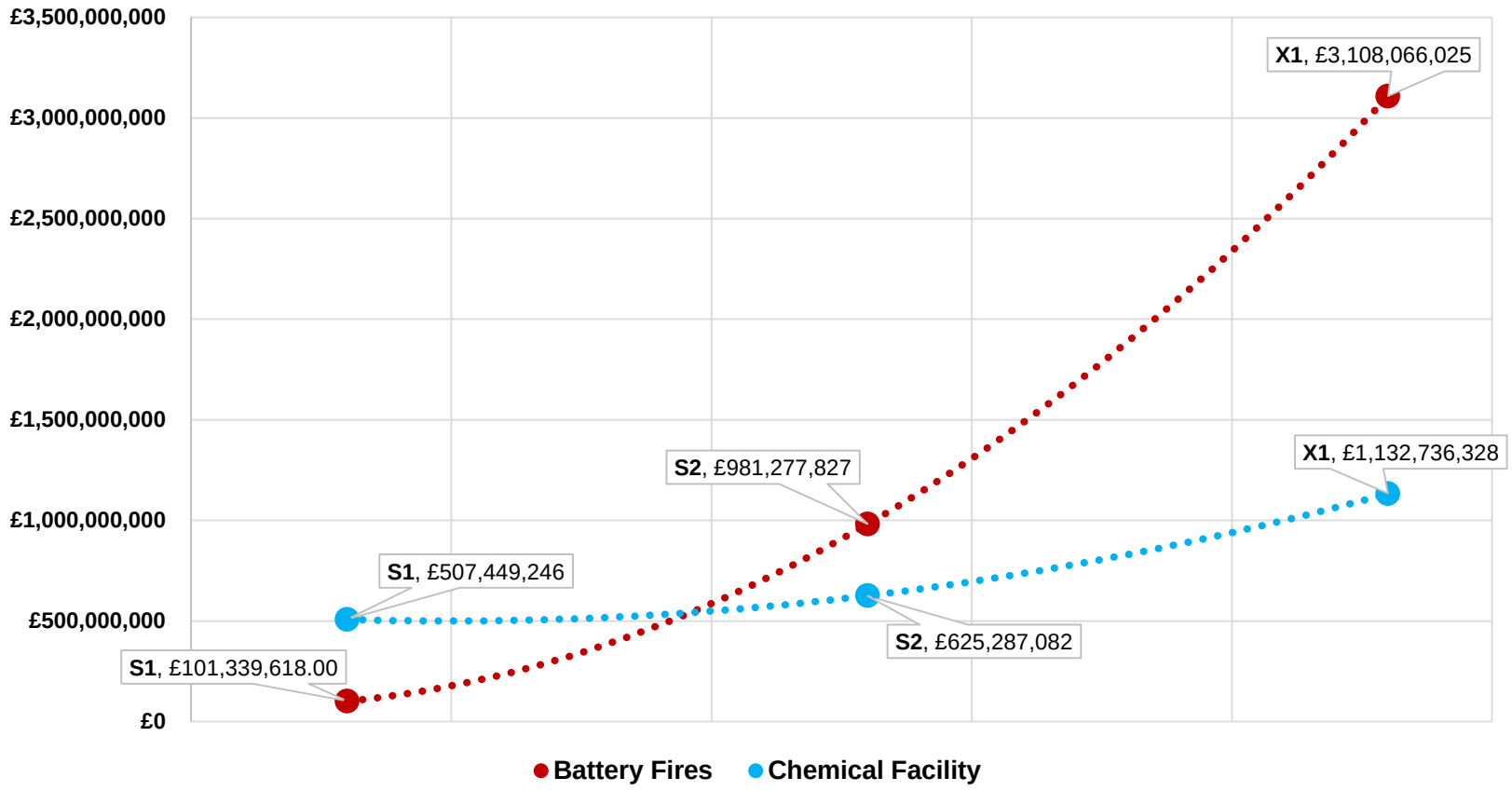
(Lithium battery fire induction)

	Mortality Rate	Physical Damage	Media Impact	Plausibility	Scalability	Direct BI Potential	Overall Economic Impact
1.7 Electrical Fires	1	6	6	3	8	3	2

	Standard Scenario (S1)	Scenario Variant (S2)	Extreme Variant (X1)
Variant Profile Description	In cases of a single laptop's destruction (LFD), 20% of affected businesses claim BI for one day. Other Fire damage variations affect 50% of Businesses.	In cases of a single laptop's destruction (LFD), 50% of affected businesses claim BI for one day. Other fire damage variations affect 75% of Businesses.	In cases of a single laptop's destruction (LFD), 75% of affected businesses claim BI for one day. Other fire damage variations affect 100% of Businesses.
Business Interruption LF3 – LF5	50%	75%	100%
Rate of workplace device ignition	0.11%	1.04%	3.12%
Total Loss Value	**£93m**	**£879m**	**£2,638m**

2017 scenario comparison

Comparison of loss estimates highlights the significant threat of exponential losses resulting from a systemic cyber terrorism attack



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The next challenge

- Future acts of cyber terrorism are likely to fall into one of two categories
    - Explosive, damaging single attacks on major physical assets
    - High-frequency attacks on a large attack surface
- Cyber terrorism will be most impactful when focused on scalability and severity
    - Rather than large singular events that have limited systemic ramifications
- Determining **likelihood** for extreme loss and high impact scenarios
    - Collaboration with the intelligence community
    - Advise on setting risk appetite for insurers

Cyber terrorism: strategic surprise

- Cyber terrorism is an emerging threat: a low-likelihood classification based on motivations and capabilities will not remain the norm
- Acts of cyber terrorism are possible, though the means to carry out attacks is currently unsupported
    - Shift from religiously motivated to politically subversive terrorism
    - Think in terms of strategic surprise
    - Generational divide in cyber knowledge will subside
    - Education in computer science will increase skills and capabilities while raising exposure to insider threats

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