

# Cyber Underwriting Solutions Overview

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September 2018

### Why Now?









2004: How do we quantify I.T. risks for AMA?



### **2009: Which model qualifies us for AMA SCR?**



### **2002-18: How do we insure against non-compliance?**







### 2019: What can we insure against?



- **Extra-territoriality**
- OTT, IOT, M2M
- Metadata
- eMarketing

### PRIMARY ISSUES FOR CYBER CARRIERS



What Data is Required?

Use High-Level Data & Modelling?

What Degree of Granularity is Required?

Is Peering a Reality?

Model Appropriateness?

Model From Effect Data or Causal Data?

(Claims/Losses)

### PRIMARY ISSUES FOR CYBER CARRIERS



What Data is Required?

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What Degree of Granularity is Required?

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Model Appropriateness?



"autopsy risk management"

### PRIMARY ISSUES FOR CYBER CARRIERS





# CYBER INSURANCE EXPOSURE DATA SCHEMA VX.0

#### 1. Accumulation Focus

This initial development of the data schema will focus **on the data required for managing exposure accumulations**, rather than other areas of decision support, such as underwriting individual accounts, risk selection and pricing decisions.

 data requested by insurers for risk selection and pricing purposes varies widely and is regarded as <u>competitive-advantage expertise</u>.

#### 4. Adopting a Categorization of Cyber-Induced Losses

• we may need to <u>extend and improve granularity</u> of the scheme, particularly for cyber liability-related loss coverages.

#### 6.1.5 Cyber Security Assessment

The cyber security score should be defined in a supporting document for the counterparty in terms of *the percentile of the total number of enterprises in that jurisdiction that are expected to qualify for that score*, ranked by quality of cyber security. For example, "<u>A security score of XX means that this enterprise is in the top 10% of enterprises in the United States, *ranked by quality of cyber security*."
</u>

### **Two Approaches to Quantification & Valuation of Cyber Risks**



**Current: Data Accumulation + Algorithmic Modelling + Comparison Against Actual** 



Aggregation Risk Why **TOP-DOWN** Does Not Work

### An example using single item in a single network, used by a single entity

Example of Basic Modelling Cyber Top-Down Issues: Entity Uses Cloud? Y/N?



### **Cloud Topology Issues**



## **Cloud Usage Issues**



## **Cloud Liability Issues**





First Layer Penetration

Supplier in China

Aggregation Risk Why **Top-Down** Does Not Work

### **Other Basic Examples Include:**

- How many processes in a mid-to-large organization?
- What is THE most troubling issue for an I.T. security department?
- Standard or proprietary technology? So what?
- What determines risk appetite / risk management quality / security / investment?
- How to model any of the variables above, let alone their interrelationships?

### Bottom-Up Valuation Methodology



Cyber risk valuation for CISO's



Cyber risk valuation (dormant)



Behavioural analytics, valuation for security

### Public Data Aggregation + Underwriting Platform



Cyber risk valuation for P&C non-cyber market; integrating into Guidewire

COTAX 2013

Data collection and analysis

CARPE DATA 2016

Data analytics: underwriting support

# Security & Insurance Bundling



Cyber security & insurance bundling



Cyber security & insurance bundling



SME Cyber security & insurance bundling

Funding		Model	Filed	Patent Protection
\$8 MLN	Cyberpoint PIVOTPOINT	Baysian Belief Network	2016	US9537884
\$6.6 MLN	<b>CARPE DATA</b>	Predictive Scoring/ Indices		None
\$5 MLN	corax	Baysian Belief Network	2018	None: Application Pending (probable 101 rejection)
\$6.2 MLN	RiskLens \$116 MLN Finjan	Factor Analysis of Information Risk	2004	10/912,863 (Abandoned)
\$31 MLN	Bay Dynamics <sup>®</sup>	Behavioural Analytics/ Data Storage	2011	US 9390082 US9171055 US9330091 US9081830 US 9183269 US8965836
\$8.15 BLN	<b>GUIDEWIRE</b> \$40 MLN <b>CYENCE</b>	Data Listening/ Diversity Analysis/ Mitigation	2014 2014 2014	US9699209B2 US10050989B2 US14585051

No.	Title	Application	Patent	Issue Date
1	System and method for covert management of passive network devices	10/050,779	US 6,944,656	13 <sup>th</sup> September 2005
2	System and method for covert management of passive network devices	EP1586185	EP1586185	25 <sup>th</sup> April 2007
3	Management of passive devices using covert connections	EP1826986	EP1826986	20 <sup>th</sup> January 2010
4	Assessing Threat to at least one computer network (non-stochastic modelling)	12/811,208	US 9,143,523	22 <sup>nd</sup> September 2015
5	Assessing threat to at least one computer network (non-stochastic modelling)	14/827,712	US 9,288,224	15 <sup>th</sup> March 2016
6	Apparatus and method for assessing financial loss from threats capable of affecting at least one computer network (non-stochastic modelling)	15/017,645	US 9, 418,226	16 <sup>th</sup> August 2016
7	Apparatus and method for calculating economic loss from electronic threats capable of affecting computer networks (non-stochastic modelling)	15/231,131	Pending 2018	Continuation Filing Date: 08/08/2016
8	Assessing threat to at least one computer network (stochastic modelling)	13/322,298	US 9,363,279	7 <sup>th</sup> June 2016
9	Apparatus and method for assessing financial loss from cyber threats capable of affecting at least one computer network (stochastic modelling)	15/012,182	US 9, 762,605	12 <sup>th</sup> September 2017
10	Assessment of Cyber Threats	15/696,202	Grant September 2018	Continuation Filing Date: 6th September 2017
11	System and method for assessing and valuing cyber risks for pricing and underwriting	62727066	Filed 5 <sup>th</sup> September 2018	Provisional Gold Standard/Semantic Fingerprinting/CTM
12	Valuing cyber risks for insurance pricing and underwriting using network monitored sensors and methods of use	16/298820	Filed September 13, 2018	Continuation Filing Date: 2018







Network Operational Risk Manager







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Kaspersky Total Security



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Audit files location:						
C:\Users\PKW\.n-orm\Audits						
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Additional Fire	Calculating	Calculating	Calculating						
New Data Centre	Calculating	Calculating	Calculating						
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Shared Projections

Predicted viruses penetrating: 12.847

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New ATM Termi	1,000,000.0	279,122,834.7	-274,803,058.4			
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Variation 4	0.0	0.0	5,319,776.3			
Variation 5	0.0	0.0	5,319,776.3			
Variation 6	0.0	0.0	5,319,776.3			
Variation 7	0.0	0.0	5,319,776.3			

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	Observed	Attempted	Viruses	Successful
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2015-07-27 to 2015-08-02	1925379	0	0	
2015-08-03 to 2015-08-09	1925379	0	0	
2015-08-10 to 2015-08-16	1925379	0	0	
2015-08-17 to 2015-08-23	1925379	0	0	
2015-08-24 to 2015-08-30	1925379	0	0	
2015-08-31 to 2015-09-06	1925379	0	0	
2015-09-07 to 2015-09-13	1925379	0	0	
2015-09-14 to 2015-09-20	1925379	0	0	
2015-09-21 to 2015-09-27	1925379	0	0	
2015-09-28 to 2015-10-04	1925379	0	1	
2015-10-05 to 2015-10-11	1925379	0	0	
2015-10-12 to 2015-10-18	1925379	0	0	
2015-10-19 to 2015-10-25	1925379	0	0	
2015-10-26 to 2015-11-01	1925379	0	0	
2015-11-02 to 2015-11-08	1925379	0	0	
2015-11-09 to 2015-11-15	1925379	0	0	
2015-11-16 to 2015-11-22	1925379	0	0	
2015-11-23 to 2015-11-29	1925379	0	0	
2015-11-30 to 2015-12-06	1925379	0	0	
2015-12-07 to 2015-12-13	1925379	0	1	
2015-12-14 to 2015-12-20	5443690	0	0	
2015-12-21 to 2015-12-27	1290487	0	1	
2015-12-28 to 2016-01-03	1076031	0	2	
2016-01-04 to 2016-01-10	4717306	0	9	
2016-01-11 to 2016-01-17	608652	0	8	
2016-01-18 to 2016-01-24	1925379	0	5	
2016-01-25 to 2016-01-31	1925379	0	1	
2016-02-01 to 2016-02-07	1493294	0	1	
2016-02-08 to 2016-02-14	1823454	0	2	
2016-02-15 to 2016-02-21	1465500	0	6	
2016-02-22 to 2016-02-28	1925379	0	12	

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New Data Centre	7,000,000.0	1,528,570,484.3	-1,535,570,484.3		1,500,000,000		
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	Sunday 06:00	12,356,789					
	Sunday 07:00	12,356,789					
	Sunday 08:00	12,356,789					
	Sunday 09:00	12,356,789					
	Sunday 10:00	12,356,789					
	Sunday 11:00	12,356,789					
	Sunday 12:00	12,356,789					
	Sunday 13:00	12,356,789					
	(GMT-2:00) South Georgia Standa	ard Time	$\wedge$				
	(GMT-1:00) Azores Time						
	(GMT-1:00) Cape Verde Time		_				
	(GMT-1:00) Eastern Greenland Ti	me					
	(GMT+0:00) Ghana Mean Time						
	(GMT+0:00) Greenwich Mean Tim	e					
	(GMT+0:00) Western European T	ïme					
	(GMT+1:00) Central European Tir	me	$\checkmark$				
	(GMT-11:00) Niue Time		$\sim$				
	Value is the hourly cost of this pr unavailable.	ocess being					
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Drag a rectangle to select everything in it.

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Credit Card Processing Pro	perties
Name:	
Credit Card Processing	
Value Desfile	
Daily	~
Time	Value (£K)
Sunday	223,445
Monday	223,445
Tuesday	223,445
Wednesday	223,445
Thursday	223,445
Friday	223,445
Saturday	223,445
Time Zone of Process	
(GMT-11:00) Niue Time	~
Value is the hourly cost of unavailable.	this process being

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Name:	
Printing	
C Outrouwood	
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Daily	~
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Daily	
Hourly	
Manday	1,255
Monday	2,334
Tuesday	5,554
wednesday	5,5//
Thursday	/,//6
Friday	99,876
Saturday	23,322
Time Zone of Process (GMT+8:00) China Standard Time	~

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Drag a rectangle to select everything in it.

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Click to select Category; Drag to move Category. Shift+Drag to create a dependency.

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Drag to a category to create dependency on it. Release Shift to move Process6 instead.



🔇 🥥 Portfolio Baseline: Physical Threats 🗙

🖪 🗈 🛈

## 🐴 Add New 🗙 Delete

Last edit saved: 2016-03-05 14:12:23 Time Profile for «New Threat»

Name	Target	Severity	Expect # attacks	Each	Uniform	~	
					Time	Fraguency	1
Flood	India	7	2	Year	Time	rrequency	L
nire Maria Thuranha	China		1	Year	Whole week	100	
ANCW HIPCOL	<pre> I arget &gt;&gt; // // // // // // // // // // // //</pre>		0				1
	Todia						
	USA						
		1					
					Time Zone of threat		1
					(GMT+1:00) Central Europe	an Time 🗸 🗸	L
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					Construction the contractions little		
					occurring in each time period	hood of the threat	
					containing in each cine period		
							1
🛥 H: 🙈 🖿 🛤 🖉	a 👩 📫 🖬 🗖					I6:53	
	- 🖓 🗳 🗤 🛤 🧿		W Internet in the second secon			21/09/2018	

🗿 n-ORM: Powered by Quantar - Portfolio2.npf					_	D	$\times$
🛇 🥝 Portfolio Baseline: Physical Threats 🗙						8	i 🗈 🛈
Add New 🗙 Delete							
Name	Target	Severity	Expect # attacks	Each	Hourly		~
		,			Uniform		
«New Threat»	Category3 🗸 🗸	1	6	Year	Daily		
					Hourly		1.373I A

· · ·
Sunday 03:00
Sunday 04:00
Sunday 05:00
Sunday 06:00
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Time Zone of threat

Sunday 01:00

Sunday 02:00

(GMT+1:00) Central European Time

Frequency is the relative liklihood of the threat occurring in each time period.

#### ORM: Powered by Quantar - Portfolio2.npf

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#### 🔾 🧭 Portfolio New ATM Terminals: Physical Threats 🗙 Baseline: Define Infrastructure 🗙 Additional Firewalls: Physical Threats 🗙

🞦 Add New 🗙 Delete				Last edit saved: 2018-09-22 15:21:37	7 Time Profile for Unathorized	Use of USB Stick
Name	Target	Severity	Expect # attacks	Fach	Hourly	
				Loch	Uniform	
Flash Flooding of Data Center	Florida	1	. 6	Year	Daily	
Major Power Outages	New York	2	2	Year	Hourly	
Hurricane Impact	Georgia	4	1	Year	Sunday 00.00	0.393 A
Unathorized Use of USB Stick	Florida	1	. 17	Year	Sunday 01:00	0.595
Vandalism to Data Centre Door Security	New York	3	1	Year	Sunday 02:00	0.595

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-	Sunday 03:00	0.595	
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	Monday 02:00	0.595	
	Monday 03:00	0.595	
	Monday 04-00	0 595	~
	Time Zone of threat		

(GMT+1:00) Central European Time

Frequency is the relative liklihood of the threat occurring in each time period.

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#### 📀 🥝 Portfolio Additional Firewalls: Physical Threats 🗙

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## 🐴 Add New 🗙 Delete

Last edit saved: 2018-09-22 15:34:59 Time Profile for Flash Flooding of Data Center

Name	Target	Severity E	Expect # attacks Eac	Each	Hourly	
					<b>_</b> .	-
Flash Flooding of Data Center	India	1	6	Year 🗸	Time	Frequency
Major Power Outages	China	2	2	Day	Sunday 00:00	0.595
Hurricane Impact	USA	4	1	Week	Sunday 00.00	0.595
Unathorized Use of USB Stick	Germany	1	17	Month	Sunday 01:00	0.595
Vandalism to Data Centre Door Security	UK	3	1	Quarter	Sunday 02:00	0.595
				Year	Sunday 05:00	0.595
				Decade	Sunday 04:00	0.595
				Century	Sunday 05:00	0.595
					Sunday 06:00	0.595
					Sunday 07:00	0.595
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					Sunday 22:00	0.595
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					Monday 01:00	0.595
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					Monday 02:00	0.595
					Monday 03:00	0.595
					Time Zone of threat	
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					(GMT+1:00) Central Euro	pean Time 🗸 🗸
					Frequency is the relative occurring in each time per	liklihood of the threat riod.
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🔾 🖉 Portfolio New ATM	Terminals: Physical Threats 🗙 Baseline: Define Infrastructur	e 🗙 Additional Firewalls: Sta	atus Summary 🗙					: i
Scenario								
Name:	Additional Firewalls							
Implementation Cost (£K):	130,000	(The cost of implementation	on relative to the baseline sc	enario. A negative num	ber means this s	cenario is cheaper to implement than the baseline.)		
Threat Data			Value at Risk					
Period 2016-02-28 to 2016-03	3-05		Acceptable Variances:	5% ~	Total N-Opvar:	£89,535,467K		
Predicted viruses penetrating:	12.847	from shared historical data	Accept As Baseline	Reset Baseline	Baseline VAR:			
Predicted successful hacks:	522.711	from shared historical data						
Predicted physical attacks:	0.4438	Physical Attacks	Reports	Aggregate	Export			
Infrastructure:			Change History					
Business processes	5		Show					
Business systems	5	Infrastructure						
System categories	5							

Key			
Observed	Externally-Sourced	User Input	Predicted

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#### ORM: Powered by Quantar - Portfolio2.npf

## 🔇 ⊘ Portfolio Additional Firewalls: Status Summary 🗙 Baseline: N-Opvar Reports 🗙

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N-Opvar by Business Process N-Opvar Historical Trend

By Process 🗸	Filter: Multiple 👻			N-0	Opvar		
Process	N-Opvar (£K)	4,500,000 -					
Credit Card Proce	. 102,845.918	4 250 000 -					
Printing	9,578.433						
Production	4,520,971.595	4,000,000 -					
Shipping	306,286.553	3,750,000 -					
Treasury	380,093.786	3,500,000 -					
		3,250,000 -					
		3,000,000 -					
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			Credit Card Pi		Ē		·
					Process		

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#### ORM: Powered by Quantar - Portfolio2.npf

## 🔇 🧭 Portfolio Additional Firewalls: N-Opvar Reports 🗙 Baseline: N-Opvar Reports 🗙

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## N-Opvar by Business Process N-Opvar Historical Trend

By Process 🗸	Filter: All 👻				N-Opvar			
Process	N-Opvar (£K)	50,000,000					 	
Credit Card Proce.	738.711.074	47,500,000 -						
Printing	6,583,781.885	45,000,000						
Production	2,640,628.882	42 500 000 -						
Shipping	49,480,989.238	42,000,000						
Treasury	16,587,788.795	40,000,000						
		37,500,000 -				·····		
		35,000,000 -						
		32,500,000 -						
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		2,500,000 -						
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			redit Card Processin	Printing	Production	Shipping	Treasury	
			5		Process			

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#### 🚱 🥝 Portfolio Additional Firewalls: N-Opvar Reports 🗙

N-Opvar by Business Process N-Opvar Historical Trend



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#### 🚱 🥝 Portfolio Additional Firewalls: N-Opvar Reports 🗙

N-Opvar by Business Process N-Opvar Historical Trend



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Portfolio Additional Firewalls: N-Opvar Reports 🗙 Baseline: N-Opvar Reports 🗙



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#### 3 Portfolio Baseline: Aggregate N-Opvar 🗙

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Aggregate N-Opvar Imported N-Opvar Locations

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By Process	~			Ν	-Opvar		
Process	N-Opvar (£K)	4,500,000					
HQ UK - Page - 1 - Credit Card Processing	102,845.918	4.250.000					
HQ UK - Page - 1 - Printing	9,578.433	4 000 000					
HQ UK - Page - 1 - Production	4,520,971.595	4,000,000					
HQ UK - Page - 1 - Shipping	306,286.553	3,750,000 ·			-		
HQ UK - Page - 1 - Treasury	380,093.786	3,500,000					
		3,250,000 ·					
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		표 2,500,000					
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				<u>p</u>			
		0	HQ UK - Page - 1 - Credit Ca	HQ UK - Page - 1 - Printi	HQ UK - Page - 1 - Producti BLocess	HQ UK - Page - 1 - Shippir	HQ UK - Page - 1 - Treasur
Export to XML							

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👴 n-ORM: Powered by Quantar - Portfolio2.npf

## 🔇 ⊘ Portfolio Baseline: Aggregate N-Opvar 🗙 Additional Firewalls: Aggregate N-Opvar 🗙

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Aggregate N-Opvar Imported N-Opvar Locations

	By Process	~					N-Opvar		
Duesee	Total			50 000 000			-		
Process	By Location			50,000,000					
HQ UK - Page	- 1 ! D		738,711.074	47,500,000					
HQ UK - Page	- 1 ! Dapicace : - Princing		6,583,781.885	45,000,000				••••	
HQ UK - Page	- 1 ! Duplicate ! - Production		2,640,628.882	42,500,000					
HQ UK - Page	- 1 ! Duplicate ! - Shipping		49,480,989.238	40,000,000					
HQ UK - Page	- 1 ! Duplicate ! - Treasury		16,587,788.795	37,500,000					
				35,000,000					
				32,500,000					
				S 30 000 000					
				27 500 000					
				8 25 000 000					
				0, 23,500,000					
				≥ 22,500,000					
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				17,500,000					
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				12,500,000					
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				2,500,000					
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HQ UK - Page - 1 ! Duplicate

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#### G 🕗 Portfolio New Data Centre: Aggregate N-Opvar 🗙



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Portfolio New Data Centre: Aggregate N-Opvar 🗙		
Aggregate N-Opvar Imported N-Opvar Locations		
Import Location File Rename Location Close location	n	
Location name	N-Opvar (£K)	Creation time
HQ UK		1,528,570,484,252.039 2018-09-21 17:32:10
	Open	×
	Look in: 🔄 .n-orm	
	Audits	
	Recent Items	
	Deskton	
	bunkup	
	Documents	
	This PC	
	Network Eiles of type:	Open
	n-orm VAR files (.niv)	

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🔾 🧭 Portfolio Baseline: Aggregate N-Opvar 🗙					-	: (i
Aggregate N-Opvar Imported N-Opvar Locations						
Import Location File Rename Location Close location						
Location name	N-Opvar (£K)		Creation time			
HQ UK		798,804,690.411 2018-09-21 16:56:36				







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🔾 🔗 Portfolio Additional Firewalls: Aggregate N-Opvar 🗙		🛃 🗟 (
Aggregate N-Opvar Imported N-Opvar Locations		
Import Location File Rename Location Close location		
Location name	N-Opvar (£K)	Creation time
HQ UK	76,031,899,873.972	2018-09-22 17:00:23

import Lo	cation File	×
	Cannot import file as its location matches the current	location.
	ОК	

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😳 n-ORM: Powered by Quantar - Portfolio2.npf	-	đ	$\times$
🔾 🖉 Portfolio Additional Firewalls: Scenario Change History 🗙		3	e ()
Changes history			^
⊨			
🗄 🗝 🕫 Changed: Infrastructure			
🗄 🗝 🗳 Changed: Business processes			
😑 🗤 🤣 Changed: Business process - Business process			
Changed: name from Shipping to Production			
□····			
🗄 🗝 🗳 Changed: Physical threats			
🖃 🗝 🗳 Changed: Threat - Threat			
Changed: Target from Florida to India			
🗄 🗝 🗳 Changed: Threat - Threat			
🖃 🗝 🗳 Changed: Threat - Threat			
Changed: Target from Georgia to USA			
🖃 🗝 🗳 Changed: Threat - Threat			
🗄 🗤 🦸 Changed: Time profile - Time profile			
Changed: Target from Florida to Germany			
🔄 🗤 🔹 Changed: Threat			
Changed: Target from New York to UK			
□···· PKW : 2018-09-22 15:33:52			
🗄 🗝 Added: Infrastructure			
Added: Business processes			
Added: Business systems			
🗈 🗝 🗘 Added: System categories			
Added: Notes -			
□			
🗄 🤣 Changed: Physical threats			
🗄 🛶 🤣 Changed: Threat - Threat			
🗄 🗤 🤣 Changed: Time profile - Time profile			
□  PKW : 2018-09-22 15:21:37			
🗄 🤣 Changed: Physical threats			
🗄 🗝 🗣 Added: Threat - Unathorized Use of USB Stick			
🗄 🗝 🗘 Added: Threat - Vandalism to Data Centre Door Security			
■ ••• PKWUSF: 2016-06-07 12:27:20			
🗄 🗝 Added: Physical threats			
🗄 🗝 🗢 Added: Threat - Flash Flooding of Data Center			
🗄 🗝 🗘 Added: Threat - Major Power Outages			
🚊 🗝 🗣 Added: Threat - Hurricane Impact			
🗄 🗝 🗣 Added: Time profile - Time profile			
Added: Target - Georgia			
			. U
			•
Import to current data	Export to	new scen	ario
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## IPTAP Covert Network Tap Internet Protocol Threat Assessment Program

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Name	Date modified	Туре	Size
DbservedThreats2015-08-17	01/12/2015 21:56	XML File	
🕞 ObservedThreats2015-08-24	01/12/2015 21:56	XML File	
DbservedThreats2015-08-31	01/12/2015 21:57	XML File	
ObservedThreats2015-09-07	01/12/2015 21:58	XML File	
ObservedThreats2015-09-14	01/12/2015 21:58	XML File	
DbservedThreats2015-09-21	01/12/2015 21:58	XML File	
🛃 ObservedThreats2015-09-28	01/12/2015 21:59	XML File	
🗐 ObservedThreats2015-10-05	01/12/2015 21:59	XML File	
🛃 ObservedThreats2015-10-12	01/12/2015 22:00	XML File	
ObservedThreats2015-10-19	01/12/2015 22:00	XML File	
🗐 ObservedThreats2015-10-26	05/03/2016 19:32	XML File	
🛃 ObservedThreats2015-11-02	01/12/2015 22:01	XML File	
🛃 ObservedThreats2015-11-09	01/12/2015 22:01	XML File	
燖 ObservedThreats2015-11-16	01/12/2015 22:01	XML File	
🗐 ObservedThreats2015-11-23	01/12/2015 22:02	XML File	
DbservedThreats2015-11-30	01/12/2015 22:02	XML File	
🛃 ObservedThreats2015-12-07	05/03/2016 19:34	XML File	
🛃 ObservedThreats2015-12-14	05/03/2016 19:37	XML File	
🛃 ObservedThreats2015-12-21	05/03/2016 19:40	XML File	
🛃 ObservedThreats2015-12-28	05/03/2016 19:41	XML File	
🗐 ObservedThreats2016-01-04	05/03/2016 19:43	XML File	
🛃 ObservedThreats2016-01-11	05/03/2016 19:45	XML File	
ObservedThreats2016-01-18	05/03/2016 19:49	XML File	

187 KB

176 KB

192 KB

187 KB

190 KB

192 KB

187 KB

ObservationStart = "2016-02-22T00:00:00"

ObservationEnd = "2016-02-28T00:00:00"

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Category = "Indiscriminate"

Target = "Unknown"

SeverityScore = "7"

- Day = "Monday"

- To = "00:59:59"

From = "00:00:00"

#### File Edit View Options Navigate Help

- «> Crimson

Version = "1"

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- ID = "1408"

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Tree Selection I	tion Dov-"Mondov" From-"10:00:00" To-"10:60:50" Count-"160"/51 Browcor			
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	ObservedThreats			^
2 Attributes:				
Name	Value			
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#### 2 Attributes:

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Na	me	Value				
=	ObservationStart	2016-02-22T00:00:00				
	ObservationEnd	2016-02-28T00:00:00				

#### 14 Subtags:

Tag name/Text	= ID	Category	<ul> <li>Target</li> </ul>	-	Severity Score	0	Observation
🚸 Threat	1408	Indiscriminate	Unknown	7		<\$	Observation (163 occurrences)
Threat	2417	Indiscriminate	Unknown	4		<\$	Observation (163 occurrences)
Threat	472	Indiscriminate	Unknown	7		<5	Observation (163 occurrences)
«» Threat	2050	Indiscriminate	SQLServer	1		<\$	Observation (163 occurrences)
♦ Threat	2003	Indiscriminate	Unknown	7		<\$	Observation (163 occurrences)
Threat	2466	Indiscriminate	Unknown	4		<\$	Observation (163 occurrences)
/ Threat	2024	Indiecriminata	Unknown	10		13	Obeanistion (163 occurrences)

#### Table Selection Browser

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# PAE (Stochastic Modelling) Predictive Analytics Engine





Status Login: admin


Status Login: admin

@  =							Quantar PAE
File	Attack Data	a Risk Results	Risk Trends	Risk Files	Run Model	Configure	
Forecast	Simulation	Save					
Run Ris	k Model	Results					

#### Attack Rate Forecasts

Severity	Id 28-Feb-2012	28-May-2012	2 29-Nov-2012	
1	57623.15	61092.18	68222.96	
4	150148.85	160229.34	180950.35	
7	422620.17	447713.22	499293.38	
10	165260,23	175677.75	197091.55	

#### **Risk Statistics**

Statistic	28-Feb-2012	2 28-May-201	2 29-Nov-2012	
Mean	217.64	217.25	217.33	
Variance	20550.09	20461.32	20459.16	
RSV-Lo	9320.58	9280.54	9286.80	
RSV-HI	11229.50	11180.78	11172.35	
CL 95%	444.13	443.63	443.17	
CL 99%	468,69	468.04	468.69	
CES 95%	501.26	543.93	485.07	
CES 99%	679.99	857.91	655.61	

@    <del>-</del>						Quan	tar PAE			
file	Attack Data	a Risk Re	sults	Risk Tren	ds	Risk Files	Run Model	Configure		۵
General	Forecasting	Simulation	Users	Add	Edit	Remove				
	PAE Model Setu	qu		Applicati	ion User	5				
					Sin	nulation C	onfiguration	n Parameters		
		PD	F Monite	or Setuj	р		RAG	Varning Setu	<b>o</b>	
		Nu	m Bucke	ts:	100	)	Measu	ire:	Confidence Level	
		Cac	he Size:		100	)	Percer	ntile:	95%	
		Alp	ha Value	2	0.7	5	Tenor		365 days	

Monte-Carlo	Simulation

Margin Size:

Number Iterations:	10000
Time Steps (days):	90;180;365

0.05

0			

Measure:	Confidence Lev			
Percentile:	95%			
Tenor:	365 days			
Red Level:	150			
Amber Level:	120			





Use Case 1: Cyber Underwriting

#### **Assess Prospective & Actual Cyber Client Risk**



View cyber threats experienced by the insured over time



Analyse insured's risk across business processes

### Use Case 2: Pricing

#### Price risks by coverage and terms





Develop pricing strategies by coverage based on stochastic simulations for a single or an aggregation of entities

# Use Case 3: Accumulation & Exposure Management

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File	Attack Dat	ta Risk Resul	ts Risk	Trends 👘 Risk Files	Run Moo	del Co	onfigure			
Forecast Run Ris	Simulation	Save Results								
-		1								
		Att	tack Rate Fo	precasts				Risk Sta	tistics	
	Severit	ty Id 12-Oct-2018	10-Jan-2019	14-Jul-2019		Statistic	12-Oct-2018	10-Jan-2019	9 14-Jul-2019	
	1	150824.42	154293,45	161424.24		Mean	217.30	217.18	217.38	
	4	420978.06	431058.55	451779.56		Variance	20481.48	20439.90	20475.09	
	7	1096786.81	1121879.86	1173460.02		RSV-Lo	9292.79	9275.45	9291.39	
	10	445144.37	455561.89	476975.69		RSV-Hi	11188.69	11164.45	11183.70	
						CL 95%	443.76	442.94	443.08	
						CL 99%	468.36	467.38	467.93	
						CES 95%	504.79	543.03	534.72	
						CES 99%	714.00	509.76	840.97	

Risk and attack forecasting; Track risk exposure over time; Aggregate cyber risk portfolios

### Use Case 4: Client Advisory & Regulatory Compliance



Estimate aggregate losses; Determine entity risk appetite; Allocate capital to mitigation actions; Regulatory reporting

### The Technology

Local installation

Threat data acquisition

**Client process/tech mapping** 

**External threat data** 

**Data analytics** 

**Financial risk exposure** 

Zero cloud security issues; removes liability risks; confidence for clients Network acquisition technology collects client-specific cyber threat data Client inputs for system – business process – category interdependency mapping Third party data extrapolated for future threats per client-specific process/topology Stochastic & non-stochastic modelling of data Output of financial & statistical risk values & mitigation option effectiveness

# In-House Compliance Use



## Product / Service Development



# **Underwriting & Risk Management**



Sample Competitor InsureTech Accelerators/Incubators



### **Current Product Status**

# QUANTAR

### IP TAP: 1. FreeBSD / Linux Server Updating (minor)

### nORM:

1. change to Wildlist URL/calculation (work-around is simple for current use)

2. Recompile code into current version of java for security

### PAE:

1. Recompile code into current version of java for security

### Future Development



### **IP TAP**

**nORM** Integration into single UI for ease of use and cohesive application **PAE** 



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You are viewing this document in PDF/A mode.	

Electronic Acknowledgement Receipt					
EFS ID:	33627821				
Application Number:	62727066				
International Application Number:					
Confirmation Number:	1787				
Title of Invention:	SYSTEM AND METHOD FOR ASSESSING AND VALUING CYBER RISKS FOR PRICING AND UNDERWRITING				

#### What's on Offer?



An existing free product to test for underwriting support and access to patented technologies; a de-risked approach

A valuable, needed free tool for the entire Hiscox Group GDPR compliance program

A co-development of future products for underwriting, product development bespoke to the needs of Hiscox for enhanced competitive advantage

A product developed to suit a value-added service offered to clients as part of their cyber package free of charge to them

A way of accumulating critical data for the entire group without compromising client's proprietary data

## To QUANTAR

A credible development partner and potential future client to attract investors; Augmentum Cap?

A door-opener to technology suppliers and other companies who can development suitable hardware

A multi-division, multi-location entity that can add value in product development; partnering potential as per Control Risks, etc

A means of accessing key players in related markets e.g. Lloyds, etc who could use the products

A way to source funding and skills to build the next generation products and to enforce patents



Presented by : Dr. Phillip King-Wilson, Managing Director, Quantar Solutions Limited

September 2018