

# Quarterly InsurTech Briefing Q4 2018

February 2019



# Quarterly InsurTech Briefing

## Introduction



**Dr. Andrew Johnston**

*Global Head of InsurTech  
Willis Re*

### Foreword: Cyber InsurTech

In this edition of the Quarterly InsurTech Briefing we take a look at the universe of Cyber InsurTech. Our aim is to understand how InsurTechs and incumbent insurance businesses are looking at cyber as both a threat and as an opportunity. More specifically, we will be assessing the appropriateness of the current tools, models, services and solutions which attempt to price cyber as a risk, and provide suitable solutions in the aftermath of an attack.

As this quarterly will highlight, cyber risk is notoriously difficult to price. In the event of a house burning down, or a car being damaged, our industry knows how to pre-emptively price and react with efficacy to an event. Decades of data and experience, coupled with the physical manifestation of determinable 'loss' allows our industry to provide the market with appropriate products and solutions. It is not so straightforward with cyber.

The cyber threat vector is constantly changing; motivations to launch a cyber-attack alter, the number of nodes connected to interconnected devices continues to grow and the impact on business interruption increases as we digitize. Perhaps even more importantly, forecasting the cost of a loss becomes ever more difficult given that what could constitute a 'cyber loss' is invariably embroiled in overlaps with other insurance products sold – for example, is a property policy supposed to cover the loss of a destroyed mainframe that was questionably breached by a cyber-attack?

In the opinion of many, our industry has been slow to innovate around cyber. Many of the earlier 'cyber' policies sold were simply repackaged tech E&O policies from the early 1990s that offered little in terms of contemporary pricing techniques to reflect the accuracy of the real-

time threat. But is this the result of laziness on the part of our industry, or does this represent a much bigger issue that, simply put, stems from the inherent difficulty of understanding cyber as a threat, relative to the role that insurance can play?

Without truly understanding where malicious attacks or unintentional outages/breaches are coming from, or understanding the true monetary value of a digital asset, or the impact that a working digital system has in the supply chain of a business (which if stopped working would cause business interruption), are those who are pricing cyber simply throwing coin tosses?

Our industry theme for this quarterly is predominately focused towards one key observation that we hold in Willis Re – if our industry is going to maximize cyber as an evolving line of business then it needs to become more comfortable pricing this risk class. In order to do this, the industry should be open to working with InsurTech businesses that specialize in demystifying cyber. Cyber is a multi-faceted, ever-evolving therianthropic phenomenon. The appropriate response to this is to task our industry with an equally multi-faceted approach. Rather than trying to specialize and excel in each tenet required, InsurTechs offer our industry a huge opportunity through strategic commercial partnering to allow incumbent insurance firms the ability to become part of a broader, more resilient jigsaw puzzle.

In keeping with previous quarters, we focus on a select group of InsurTechs who illustrate a number ways in which we can rethink and restructure our approach towards cyber – evolving the industry proposition away from the traditional method of assessing and pricing risks into an era that looks to truly understand the meaning of dynamic pricing.

Specifically, we will be assessing those InsurTechs that are targeting innovative ways to model and risk-score cyber, and those InsurTechs that are focusing on risk mitigation tactics and post-attack services and solutions. We feel these are the areas where incumbent players can benefit the most from the innovation that InsurTechs are bringing to the cyber playing field.

# Quarterly InsurTech Briefing

## Introduction

### Using technology to solve technological problems

Cyber is a daunting and exciting prospect for our industry, and for society in general. The proliferation of technology brings with it inherent vulnerabilities – ironically the use of technology is also a key tenet to making sure that the threat of cyber is detectable, containable and quantifiable. A variety of different technologies are being used to monitor and tackle the threat, notably; hardware authentication software, user-behavior analytics, data loss prevention software, deep-learned algorithms (and respective sub-sectors of artificial intelligence [AI] and machine learning [ML]) and cloud-based security processing. These types of technologies can scour networks at unparalleled speed and volume.

InsurTechs that are putting together innovative ways of tackling cyber know that it is technology itself that will play a major role in solving our exposure against the backdrop of frequency and severity.

### A multi-faceted approach to a multi-faceted problem

Throughout the course of this briefing, one of the major themes on which we will be focusing is the fact that, even boiled down to its core tenets, cyber is inherently complicated. Given these complications, a one size fits all type approach is fundamentally flawed. To truly understand the phenomena, and hope to solve/maximize it, a multi-faceted approach must be taken. This involves using a variety of models, analytical tools, and mathematical approaches – to name just a few pieces of this highly complex puzzle.

First we look at **Guidewire Cyence Risk Analytics (Cyence)**, a company designing a model that empowers the insurance industry to better understand the economic impact of cyber risks.

Secondly we visit **Corax**, an InsurTech that has developed innovative analytics tools to help the insurance industry design, price and sell appropriate cyber products to the market.

We then shift focus slightly away from those companies who are working specifically on tools for the (re)insurers themselves, to three companies that also serve commercial businesses and individuals directly.

First, we speak with **Paladin**, an InsurTech creating business-centric tools to detect cyber risks, protect against those risks, buy insurance and offer post-attack services.

We then look at **Zeguro**, a company designing tools for businesses to engineer out their risks.

And finally, we spend time with **ReFirm Labs**. ReFirm Labs is probably the least traditional InsurTech of the companies featured in that its offering is not necessarily insurance (only) focused. Its inclusion, however, is vital in our bid to highlight the fact that non-traditional approaches can be adopted by our industry to create appropriate solutions. ReFirm Labs' team of experts vet and validate the strength of firmware – the very types of soft and hardware that we, and the clients that we support, use.

Understanding the strength of the technology we're using is just another vital part of the jigsaw puzzle.

### Our own global perspective on cyber

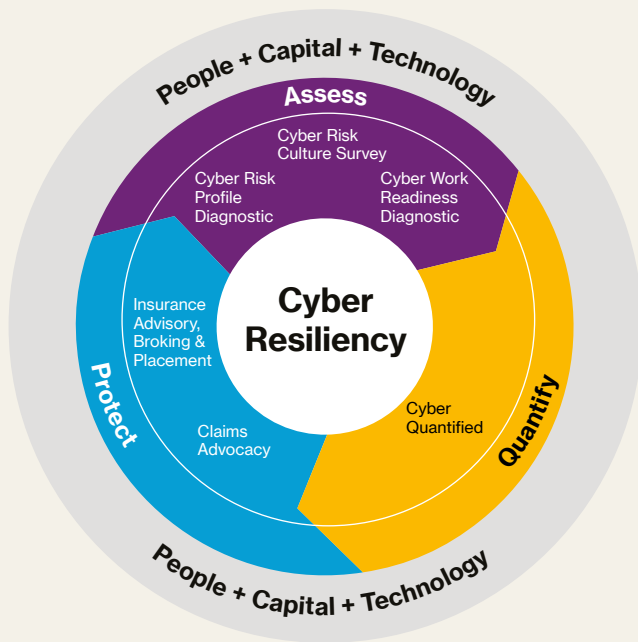
While our primary goal in this briefing is to focus on cyber InsurTech solutions, Willis Towers Watson does boast its own world-leading Cyber practice, and we will feature much of the proprietary survey material that we have collated from the corporate and insurance industries over the last couple of years. This will provide insight into global trends and approaches toward the issue. It will further highlight the various benefits for incumbent firms, both commercial and insurance-related in working with InsurTech firms that place a significant weight on technology to help provide answers to the fast-growing topic.

Per our recommended multi-faceted strategy, Willis Towers Watson's holistic approach to cyber risk evaluates all threats – from people, capital, technology, through three stages – assess, quantify, protect to ensure that the enterprise is best prepared to protect and grow its business.

- Assess risks through Cyber Risk Culture Survey and Cyber Risk Profile Diagnostic
- Determine optimal risk transfer strategies and financing limits using Cyber Quantified
- Use the above solutions to mitigate risk and address the exposure via risk transfer – Cyber Insurance

# Quarterly InsurTech Briefing

## Introduction



### The quarter in review

As always, we conclude the report with the InsurTech Data Center. The past few quarters have shown a steady increase of InsurTech funding, and Q4 2018 is no different. The \$70 million investment into **Hippo**, for example, has continued to drive the upward momentum of capital raising in the InsurTech space.

Ultimately, we want to illustrate that cyber is a very difficult nut to crack, and no one actor can do it on their own. To succeed, we, as an industry need to work together to agree on things as simple as basic terminology and as complicated as “silent cyber”. Embracing InsurTech businesses and other outside firms can help us make huge leaps toward filling in key parts of this complex puzzle. Cyber offers our industry a huge opportunity to reinforce the relevance of insurance in this vastly changing world.

As ever we welcome your feedback, and we wish to thank you again for your unrelenting support.

### The bringing together of disparate worlds

Willis Re's Global Head of Cyber, Mark Synnott, is this quarter's industry expert. Mark shares his thoughts with the market on both the opportunities generated by cyber and also the threats posed.

### Transaction spotlight

In the Transaction spotlight section of the report, we feature a very rare InsurTech occurrence – an initial public offering (IPO). In Q4 2018, Germany's first InsurTech IPO was announced when **Deutsche Familienversicherung (DFV)** became listed on the Frankfurt Stock Exchange. DFV's extensive use of AI and third-party Internet of Things (IoT) devices, such as Amazon's Alexa, has allowed them to excel in their product, service and sales proposition in health, property and casualty insurance.

# Quarterly InsurTech Briefing

## Table of Contents

<b>I. Q4 2018 Industry Theme.....</b>	<b>5</b>
<i>Cyber InsurTechs – helping incumbents make sense of the threat and maximize the opportunity</i>	
<b>II. InsurTech Company Profiles.....</b>	<b>10</b>
<i>Innovative solutions for an industry headache – Modeling, Risk Scoring, Mitigation Procedures, Digital Products, Post-Event Services and Firmware Vetting</i>	
<b>III. Transaction Spotlight .....</b>	<b>30</b>
<i>Europe's First InsurTech IPO – Deutsche Familienversicherung</i>	
<b>IV. Thought Leadership.....</b>	<b>32</b>
<i>Cyber – Opportunity or Threat?</i>	
<b>V. The Data Center .....</b>	<b>34</b>
<i>InsurTech by the Numbers</i>	



# Q4 2018 Industry Theme

## Cyber InsurTechs – Helping Incumbents Make Sense of the Threat and Maximize the Opportunity

For the Q4 2018 Quarterly Briefing, we are concentrating our attention on the InsurTech community that focuses on cyber. In the last few months, cyber has come back into the industry crosshairs in a very real way. This has been driven by some major breaches, new entrants coming into the space, and a growing supply and demand issue of products and services. In one data breach attack alone in 2018 (Aadhaar breach, India), 1.1 billion records were breached.

“Cyber,” as a term, has become synonymous with (the use of) computers, information technology, virtual reality and, most importantly, the Internet. It largely envelops all policies that stem from computer systems and digital networks. From an insurance and reinsurance perspective, cyber-related attacks and claims can encapsulate activities that range from petty data theft to full-blown cyber war (such as the shutting down of critical infrastructure across an entire nation). As a result, cyber-related activities and entities, once tangibly manifested, can significantly overlap traditional sectors of an already matured insurance market place (theft, property damage, business interruption, liability).

Rather than considering cyber as a thing, it might be far more beneficial for us to start considering cyber as a contemporary way of viewing the presentation of traditional issues and objects that are now bound by a series of interconnected conduits and pathways. It joins assets, physical and digital, in a manner that transcends geography, industry, size, language, personnel and interface technology.

In order to avoid falling into the pitfalls of misunderstanding the potential risks and benefits of cyber, the term should not be taken too literally or precisely. Each facet of interconnectedness needs to be assessed in its own right – and the interconnectedness itself is of paramount importance to us when we later consider the associated risks and benefits of its systematic capabilities and vulnerabilities. For the remainder of this briefing, the use of the term cyber will be directly related to its place in the insurance and reinsurance world (most often when the cyber is a vessel to directly and indirectly cause damage to an individual, firm, government and/or nation state).

Understanding that cyber issues often start at the individual business and person level, for (re)insurers to really get a handle on pricing this risk, is a major step forward in understanding the risk wholly. It is from this base, coupled with interconnectivity exposure and “asset value,” that genuinely salient data can be sourced. According to survey data collected by Willis Towers Watson’s international Cyber practice, “one in five U.S. and U.K. organizations reported that their organizations have suffered a cyber breach in the last year; with 6% of those incidents having been significant, consistent with publicized, recent large cyber breaches”.

Two-thirds of U.S. companies, and just under half of U.K. businesses, see cybersecurity as a fundamental challenge to their organization, as reflected in the priority given to cybersecurity – 85% of U.S. employers, and 72% in the U.K., regard it as a top priority.

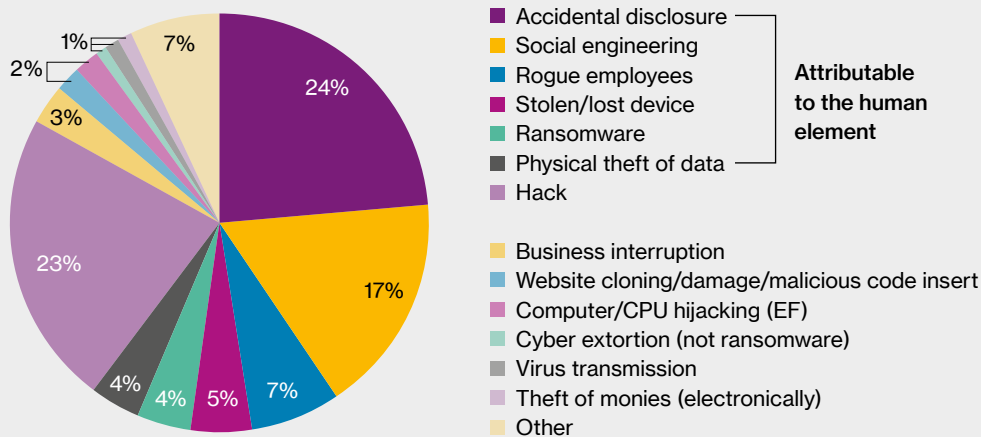
While a significant proportion of cyber system outages are the result of malicious intentional attacks, technological savviness and staff negligence actually represent the largest threat factors for cyberinsurance claims in the U.S. While this may seem like respite to those trying to solve this problem (as it’s arguably more predictable or at least an easier fix when compared with highly aggressive individual hackers or hostile nation states), it does, in fact, represent just how fickle these issues can be – a forgotten laptop on a train or a weak password have caused financial devastation over the years, and there is no way of engineering out this risk with any kind of ease.

# Q4 2018 Industry Theme

## Cyber InsurTechs – Helping Incumbents Make Sense of the Threat and Maximize the Opportunity

### Type of Loss

2017-2018 Reported Claims Index



There is growing impetus behind the view that building effective cyber resilience has to have its roots within the organization culture and its people. Solutions are likely to be complex and multidimensional, as is always the case for any kind of cultural change. Certainly, companies may have to adapt their operations to the constantly changing nature of cyberthreats. Nor should they ignore the expanding risk mitigation options available through the insurance market. But employers will increasingly look to foster a more cyber savvy workforce, including the use of innovative employee engagement, talent management and reward strategies, to fortify their cybersecurity posture.

While many industry participants have spoken at length about the associated threats and opportunities being created by cyber, and their desire to make a positive impact, a disproportionately small amount of organic progress has been made in 'solving/maximizing' this issue.

One of the major issues that we have observed as a business is the problems created by a lack of standardization around such things as clauses, definitions, vocabulary, the effects of silent cyber (to name just a few). If we take vocabulary as one example, what constitutes a cyber event is still being hotly contested by a number of players in our industry. Without having even these basic pieces of the puzzle agreed upon naturally makes it very difficult to transfer risk originated in the primary market to pools of capital that could ultimately deepen the liquidity of the global cyber market.

The demand for cyberinsurance is only going to grow from here on out, as the application of IoT devices accelerates from the 20 billion devices in use today to the 200 billion-plus expected to be in use in the years to come.

In March 2018, The Economist Intelligence Unit (EIU) surveyed 452 senior executives and board members with cyber responsibilities on how their companies were attempting to become more cyber resilient. This survey was sponsored by Willis Towers Watson.

The companies in the survey ranged in size from \$100 million in annual revenue to more than \$25 billion. A third of the companies were in North America (the U.S. and Canada), a third in Asia (Tokyo and Singapore) and a third in Europe (100 in the U.K. and 52 spread across France, Spain, Italy, Germany and the Netherlands). In the past year, a third of the companies surveyed experienced a serious cyber incident.



# Q4 2018 Industry Theme

## Cyber InsurTechs – Helping Incumbents Make Sense of the Threat and Maximize the Opportunity

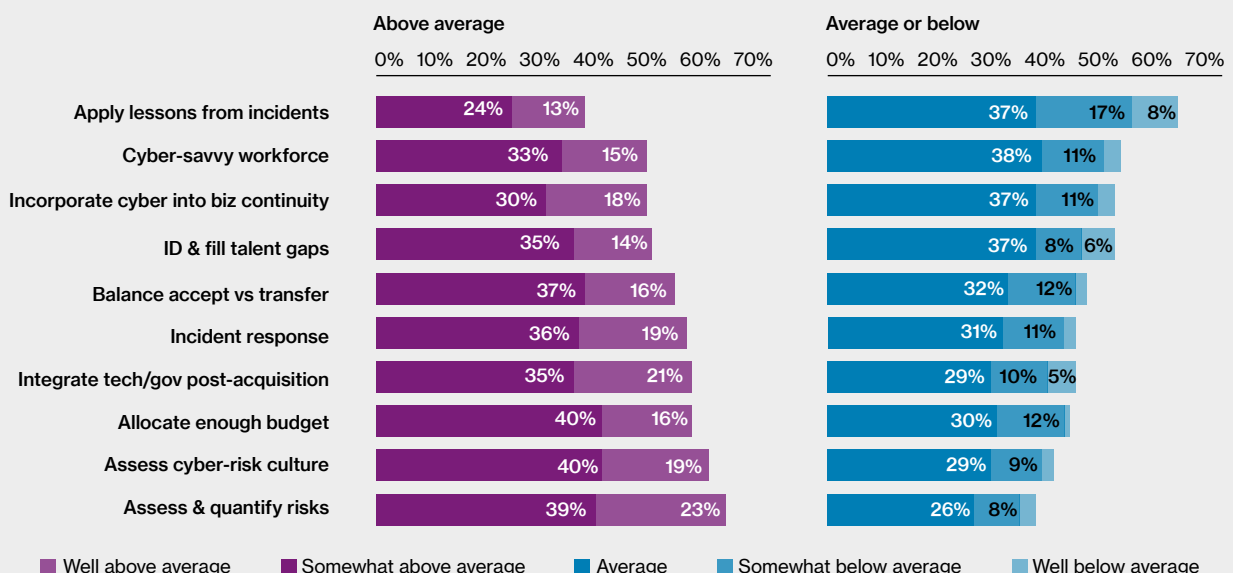
The consistent feedback of the high prevalence of cyber issues from this global survey data might make for daunting reading. InsurTechs have, however, been able to bring something very positive to this complicated table. Cyber requires a multi-faceted smorgasbord of solutions to make sense of the overall problem and bigger picture. To expect one (re)insurer to have all of the tools required at its disposal to solve this issue is unlikely. What InsurTechs have been able to do is provide expertise and deep technical knowledge on very specific pieces of the overall puzzle.

Using a combination of models, analytical tools, access to new sources of data, landscaping of the interconnected world, intel on the dark web, deep knowledge of political and social malaise and expertise from digital security systems, the broader InsurTech ecosystem offers our industry an enormous opportunity to make significant headway, through partnerships and strategic relationships, to capitalize on cyber, with the ultimate goal of pricing this difficult risk appropriately.

We focus on two distinct groups of InsurTechs in the rest of this briefing: those that are providing innovative solutions for (re)insurers, and those that are providing innovative solutions for the commercial and personal lines market directly. We will assess how their offerings fit together, in conjunction with the products, services and most importantly, the distribution channels of those actors in the incumbent market who are focusing on cyber.

While it was feared that InsurTechs would look to disrupt the traditional space, given the perception that cyber represented a relatively open playing field of competition between mature and nascent players, we will demonstrate this has simply not been the case; the greatest progress has been made when companies have partnered, not competed.

### How companies assess their cyber-resilience competencies



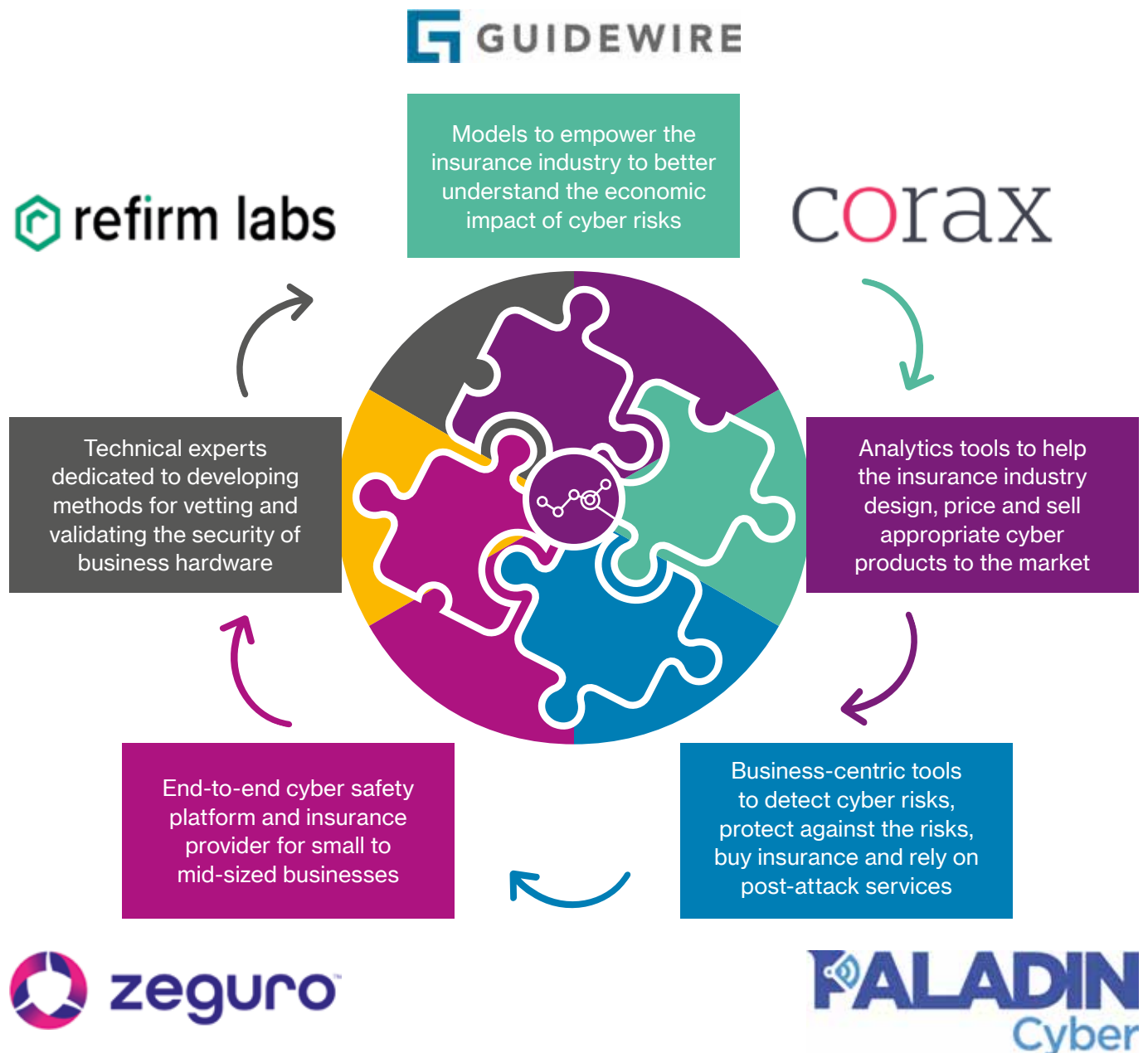
# The Cyber InsurTech Landscape

A snapshot of innovative companies in the cyber space



# The Cyber InsurTech Landscape

Select InsurTechs Piecing Together the Cyber Puzzle



# InsurTech Company Profiles

## Innovative Solutions for an Industry Headache

*Providing a Cyber-Modeling Tool for (Re)insurers*

Models for the industry



Guidewire Cyence™ Risk Analytics (Cyence) combines economic/risk modeling, cybersecurity and big data analytics to create an economic cyber risk modeling platform. This cloud-native solution is leveraged by leaders across the insurance industry to help prospect and select risks, assess and price risks, manage portfolio risk accumulations and develop new insurance products with confidence.

Through a process called data listening, Cyence collects vast amounts of technical and behavioral data from a variety of sources at Internet scale, including public data, open-source data, proprietary data and third-party data. Subsequently, Cyence curates the data and applies sophisticated machine-learning techniques to find the signal through all the noise. This massive collection and processing effort produces risk models that are delivered in a user-friendly, cloud-based application. P&C insurers are now able to get the insights that address questions such as: “What accumulation risks should I be worried about for my book?” “How can I differentiate these risks when they look so similar?” “What is in my book’s 1-in-50-year loss?”

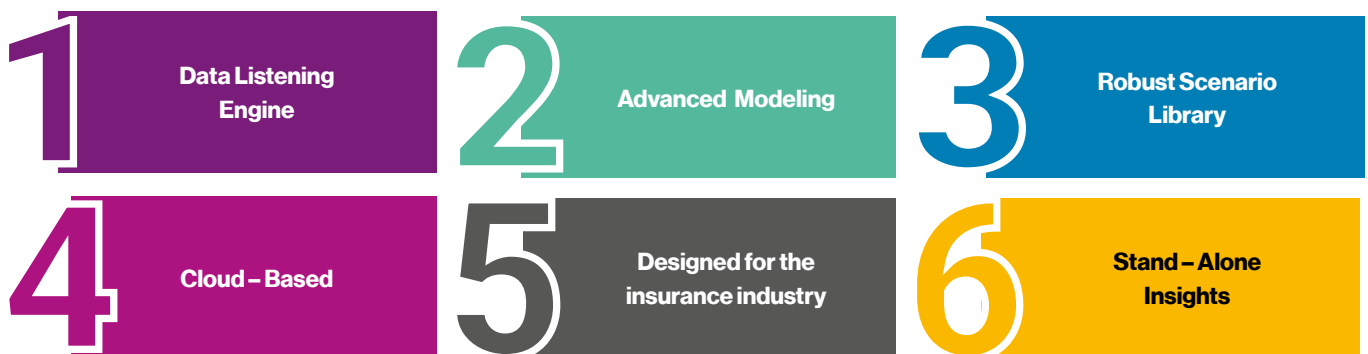
The cybersecurity technology industry is full of scores, ratings, and scorecards, but many tools measure technologies and technical metrics in a vacuum. While important, technology itself is not an adequate predictor of cyber risk – many companies with state-of-the-art technology are breached, while others with legacy technology are not. To assess cyber threat, Cyence leverages a variety of econometric risk models and uses real breach data aggregated from multiple sources. However, technology assessment is just the beginning.

Cyence also:

- Measures companies’ cyber posture from the perspective of people and process
- Assesses adversary motivation and behavior
- Examines attack capabilities
- Considers the impact of a well-timed attack

In addition to using the broadest and deepest collection of technology assessments on companies, Cyence constantly trains and refines its predictive risk capabilities to provide customers with the best understanding of cyber security risk.

### Key Benefits



# InsurTech Company Profiles

## Innovative Solutions for an Industry Headache

*Providing a Cyber-Modeling Tool for (Re)insurers*

Models for the industry



### Paul Mang – General Manager, Analytics and Data Services at Guidewire



- Before joining Guidewire in 2018, Paul Mang served as the Global CEO of Analytics at Aon plc.
- Paul is a former Partner at McKinsey & Company and a leader in its North American Insurance practice.

#### 1. What are your views on the current cyberinsurance market? Why do you think that there is still such a low proportion of firms buying cyberinsurance?

The cyberinsurance market has been growing rapidly; as one study shows it was valued at \$5.5 billion in 2018 with a projected compound annual growth rate (CAGR) of 26.5% from 2019 to 2028. This growth is not surprising; cyberattacks have become the most prominent threat or disruption to business entities in recent years.

With the evolving sophistication of hackers, and the multiplication of attack vectors, corporate entities are concerned about damage to their brands, stability of revenues, and the safety (and privacy) for their employees and customers.

However, potential insureds are wary of the value of new innovations in the complex area of cyberinsurance. And underwriters themselves are facing the daunting task of addressing risk selection and accumulation management challenges in a world of limited authoritative data sources and standardized analytics solutions. These are exactly the issues we are focused on at Guidewire to help develop this market with our insurance carrier partners.

#### 2. Why did the Cyence team choose to create a modeling tool for cyberinsurers? How do you work with insurers to understand their exposure?

To overcome the technology gap mentioned above, Guidewire Cyence™ Risk Analytics (Cyence) was created as an analytical tool to help our insurers, reinsurers, regulators and brokers better understand the impact of 21st century risks in dollars and probabilities. This unique approach combines economic/risk modeling, cybersecurity, and big data analytics to create an economic cyber risk modeling application to help prospect and select risks, assess and price risks, manage portfolio risk accumulations, and develop new insurance products with confidence.

Through a process called “data listening,” vast amounts of technical and behavioral data are collected from a variety of sources at Internet scale, including public data, open-source data, proprietary data, and third-party data. Next the data is curated, and sophisticated machine-learning techniques are applied to find the signal through all the noise. This massive collection and processing effort produces risk models to help insurers better understand enterprise exposure to cyber risks.

#### 3. Given the relative youth of the cyberinsurance market, why did you choose to market Cyence Risk Analytics as a tool for incumbents rather than establish yourselves as an MGA?

In 2013, the Cyence team identified a critical gap in how cyberinsurance was being quantified and managed between the risk management and cyber security communities. We aspired to build a best in class Silicon Valley modeling firm to bridge this divide, by providing an analytical foundation to reinforce the fledgling but critical cyberinsurance marketplace.

With this focused vision, we have been able to partner with leaders across the industry to deliver critical data needed to support capital adequacy and support complex underwriting and accumulation management use cases in a catastrophe prone line. For example, in 2017 we issued a report with Lloyd's of London called “Counting the Costs: Cyber Risk Decoded,” which informed the market about cyber accumulation risk in the language of insurers and is now a reportable scenario for Lloyd's markets. Most satisfying isn't the publicity, but rather the successes of our clients. With varied views on cyber risk in the market, it has been common for us to hear that Cyence data formed the cornerstone of critical capital allocation decisions at the board level of our customer partners.

# InsurTech Company Profiles

## Innovative Solutions for an Industry Headache

*Providing a Cyber-Modeling Tool for (Re)insurers*

Models for the industry



### 3. Cont.

Guidewire Software purchased Cyence in late 2017 not only for its expertise in cyberinsurance, but also for our shared focus in supporting the insurance industry, focusing on identifying and operationalizing deep risk insights into their businesses, enabling growth through data-driven product development, underwriting, pricing, and risk management strategies. This fits perfectly with Guidewire's mission to deliver the industry platform that P&C insurers rely upon to adapt and succeed in a time of accelerating change. We believe that insurance plays a vital role in protecting people and business and in enabling society to function, and we are proud to serve it with a focused commitment on delivering advanced analytics and data services.

### 4. Last year you modelled several aggregation scenarios with Lloyd's; how do you ensure that your model remains vigilant and aware of these aggregations of risk?

The Guidewire Cyence team collects all its own data and it's not a once and done exercise – we are constantly collecting new data so that our application can effectively track new and emerging cyber risks. This is a differentiator for Cyence Risk Analytics since other vendors in this space often just purchase aggregated data sources. By collecting and curating the data ourselves, we have a deeper understanding of the data and any inconsistencies or trends. Also, the Cyence team tests our model monthly to ensure predictive accuracy.

### 5. Cyence was acquired by Guidewire in 2017. Can you comment on how this has changed the product offering or how you market yourself to your clients?

It has not changed the current Cyence Risk Analytics offering, but having access to a larger distribution channel with a market leader like Guidewire has enhanced our ability to get new products into the market. Also, Guidewire is continuing to invest in the Cyence products so we can apply our unique data listening capabilities to other lines of insurance business besides cyber. Cyence is part of a broader offering at Guidewire called Analytics and Data Services (ADS), which will continue to focus on innovation in analytics.

### 6. Please comment on how you see the future of the cyber market? Do you see cyberinsurance becoming as ubiquitous as say property insurance?

We expect that the cyberinsurance market will continue to grow in terms of premium due to the increasing criticality of the exposure to all businesses and consumers. As more companies become aware of the inherent exposure of doing business in an interconnected world, they will look to mitigate and transfer that risk to insurers. Cyber exposure could also serve to return insurance carriers to the position of trusted partner in times of distress. This dynamic will be especially prevalent in the small and mid-sized business segment, where many companies do not have the necessary resources or awareness to effectively combat or remediate cyber risk and the potential financial impact. The insurance market as a whole will also experience rapid change as (re)insurers more fully embrace analytics and machine learning as tools to more effectively select risks and manage the subsequent balance sheet exposures.

Although the cyber market is forecasted to grow rapidly over the next several years, it still has a long road ahead to catch up with the global property market. Given that cyber exposures are not currently addressed as a peril, but instead as a siloed product, it remains to be seen if the cyber market will continue to thrive as a standalone line or will be partially or wholly consumed by the more mature lines, notably property. It is likely the answer lies somewhere in between given the highly complex and evolving nature of cyber risk and the level of specialization necessary to assess.

### 7. Why do you think the incumbent market has struggled with the issue of cyber? Is this something that businesses such as yours can help to improve?

Having access to more data for enhanced decision making around what product to offer, what types of business to write, and how to price products has certainly helped some of our customers grow their cyber books. It's not that there isn't data out there; it just takes expertise to collect, curate and analyze the data – and it's not a trivial exercise. Cyence collects and processes over a petabyte of company-specific technical and behavioral risk data per month.



# InsurTech Company Profiles

## Innovative Solutions for an Industry Headache

*Providing a Cyber-Modeling Tool for (Re)insurers*

Models for the industry



### 7. Cont.

The (re)insurance market in general struggles with any unknown and has, for the most part, been cautious about exposing capital to a risk, which is extremely difficult to quantify. The industry also relies very heavily (exclusively in some cases) on prior experience. The problem that has vexed many re/insurers entering the cyber market or looking to grow a nascent cyber practice is the lack of historical data from which to determine the frequency and severity of event, along with the constant evolution of these dynamics. Lacking these data and insights makes pricing and capital allocation nothing more than an educated guess in many instances. Another area with which many insurers struggle is the unique nature of cyber risk when compared to more traditional lines. Unlike natural catastrophe risks like hurricanes or earthquakes, cyber risk involves an active adversary. Re/insurers have struggled with how to assess a risk where malicious actors can quickly alter their attack vector and potential to affect clients in a systemic manner.

Cyence has tackled this problem by modeling not only the technical risk associated with cyber, but the behavioral risk associated with people and process. By modeling people, process and technology and then translating that into frequency and severity, we help our customers assess the financial impact of cyber risk. And our continual data collection and modeling helps insurers keep pace with an evolving risk. With better insight into the potential financial risk associated with both individual companies and accumulation risk across entire portfolios, our customers have been able to enter new markets, offer new coverages, gain market share and optimize portfolios.

### 8. Where do you see your business, in say five years' time?

Our aspiration is to be a market leader with majority market share for modeling in the cyberinsurance market as well as growing new solutions for other lines of business. Guidewire's ADS business will become a distinctive advantage for insurance carriers seeking to maximize returns on their investments in data and analytics to better serve their customers.

### 9. In addition to innovative models, new products and cyber-landscape monitoring, what other capabilities do you think less-established businesses can bring to the table?

Newer businesses have the ability to develop in a more agile way and can leverage the experience of more established companies by partnering with them as well as relying on open source code and third-party data.

### 10. Do you believe that a lack of historical data and expertise on this topic makes for a more "open playing field" for InsurTechs to potentially compete with the incumbents?

Lack of claims history or anything that companies can't easily do but want to – creates an opportunity for InsurTechs. For cyber risk models specifically, the limited claims history can be a great advantage for new entrants. For example, Cyence now has four years of cyber risk data. That may not sound like that long of a period, but anyone entering now, or even two years earlier, would be that much behind. But it's difficult to compete with incumbents in terms of the size of their distribution channels and the breadth of their relationships in the industry.

### 11. What advice would you give to incumbents who are looking to write cyber in the future?

Re/insurers exploring the possibility of entering the cyber market are likely already exposed. The risk of non-affirmative, or silent cyber exposure is an issue many re/insurers are grappling with, and every insurer regardless of appetite should be aware and considering the potential balance sheet implications. With that in mind, all re/insurers should treat cyber as a risk they are already writing, either intentionally or unintentionally. They should allocate the appropriate resources, both internally and externally, to assist with understanding their current landscape. Only when the landscape is level-set should a re/insurer enter the affirmative cyber market. Entering the affirmative cyber market is a significant strategic initiative, requiring not only underwriting expertise, but actuarial, exposure management and risk engineering. External partners with advanced and highly-focused capabilities in areas such as modeling, analytics and cybersecurity, should also be strongly considered as they greatly assist in augmenting a re/insurers current data and modeling capabilities.

Lastly, cyber risk is unique in that the exposure presents as both short and long tail and is horizontal across multiple lines of business. This makes it difficult to neatly place into a pre-existing silo. Many of the mature cyber markets have been extracting cyber from existing lines and creating a stand-alone class, allowing them to allocate capital, underwriting and support resources accordingly.

### 12. What types of data should the market be capturing to try and improve its ability to understand the threat, and price cyber products?

The cyber security technology industry is full of scores, ratings, and scorecards, but each tool measures technologies and technical metrics in a vacuum. To more accurately assess cyber threat, the market should leverage a variety of econometric risk models and using real breach data aggregated from multiple sources, incorporating data that:

- *Measures companies' cyber posture from the perspective of people and process*
- *Reflects adversary motivation*
- *Examines attack capabilities and tools*
- *Indicates the impact of a well-timed attack, past, present and future*

### 13. Do you think that the proliferation of IoT devices and sensors will make the ability to properly underwrite cyber even more difficult? How are you planning to tackle the growing number of potentially vulnerable interconnected devices?

Yes, this proliferation will absolutely add complexities to underwriting cyber. We are entering a new era of connected devices, ones that move in and out of personal spaces, move mechanical equipment and are more integrated than ever. Understanding cyber exposure means that companies need to accept and secure IoT in the same manner as their corporate systems. We also actively research new types of silent cyber, an event where a cyberattack triggers loss on other types of insurance policies.

We continue to expand our offering and research in IoT. We use scalable cloud architecture to keep up with the quick pace and growing number of devices so we can collect the best and most accurate data available.

# InsurTech Company Profiles

## Innovative Solutions for an Industry Headache

### Providing Cyber Analytics Tools for (Re)Insurers and Brokers

Founded in 2014 and headquartered in London, Corax provides data, modeling and analytics on the cyber exposure of millions of companies worldwide through its AI-enabled platform. Co-founded by CEO, Jonathan Pope, and CTO, Tom Beale, Corax is on a mission to be the number one provider of cyber data to the insurance industry and beyond.

Corax is arguably one of the world's leading and largest sources of cyber exposure data and loss analytics for insurance, providing customers with enriched data, modelled loss and customized analytics on the cyber security and technology resilience of more than 10 million companies worldwide.

Corax is already being used by (re)insurance carriers to more accurately underwrite and manage cyber risk exposure, and by insurance brokers and agents to provide clients with precise cyber risk assessment and cover recommendations.

Corax's rich data foundation is created through expert ingestion and analysis of third party data sets, including threat intelligence, Internet performance data and loss data, and using proprietary automated discovery tools

Analytics tools for  
the industry

corax

A leading and significant source of cyber exposure data and loss analytics for insurance.

that identify detailed characteristics of the technology and security environment on individual companies. Granularity of cyber hygiene and technology resilience for each modelled company is provided down to the software version and location of Internet-facing IT assets.

Modelled data is developed within a proprietary AI probabilistic engine to predict the expected cost of data compromise and IT disruption with unprecedented accuracy.

Another key factor driving Corax's adoption is the flexible way customers can consume the product. Corax's rich data set, its modelled output, or custom analytics (where clients modify inputs to the model), can be consumed either individually or combined, and delivered either via API or via Corax's online interface.

Corax has experienced rapid market adoption since becoming commercially available to the insurance industry in late 2017. It now has 20 customers and over 200 users worldwide, including reinsurers, insurers, MGAs, wholesale and retail brokers. Consequently, Corax is fast establishing itself as the go-to cyber risk analytics tool for the entire insurance community.



# InsurTech Company Profiles

## Innovative Solutions for an Industry Headache

*Providing Cyber Analytics Tools for (Re)Insurers and Brokers*

Analytics tools for  
the industry

corax

### Jonathan Pope – CEO and Co-Founder



- Jonathan is an ex-British Army officer and consultant who led an operational review of cyber security and insurance at an international law firm and provided recommendations at Board level.
- This inspired Jonathan to start Corax with the aim of putting the Board, insurance, and IT/security “on the same page” to help them make smarter decisions.

#### 1. Given the relative youth of the cyberinsurance market, why did you choose to market Corax as a tool for incumbents rather than establish yourselves as an MGA?

We didn't have the deep insurance expertise needed to be an MGA. What we did have, however, was strength in security and data expertise, and a scalable technology platform with an agile development team, the combination of which was exactly the foundation required to tackle cyber, which was and remains an evolving and complex challenge. Our approach has been to partner with the insurance industry to fulfil the final requirement - insurance expertise - and the market has responded particularly well to our collaborative approach because we've developed exactly the cyber solution for insurance they've been looking for.

#### 2. How does your product take into consideration an insurer's own view of risk?

The answer to this question is one of the reasons we've experienced rapid market adoption! It was clear from the outset that the market, whether capital providers or distributors, wanted to develop their own view of risk. So, in our platform clients are able to modify our model to do that, for example by modifying the inputs, such as firmographic data on insureds, and from that create their own internal scenario models. Alternatively, they can choose to consume only our underlying data as an input into their own models.

#### 3. Please comment on how you see the future of the cyber market? Do you see cyberinsurance becoming as ubiquitous as say property insurance?

We have little doubt that the cyber market will continue to grow, to the extent that there is plausibility of a future new property, casualty & cyber market structure. We also see the future cyber market with interesting new products as the market becomes more comfortable and confident on data and exposure, particularly around parametric products.

#### 4. Why do you think the incumbent market has struggled with the issue of cyber? Is this something that businesses such as yours can help to improve?

Simply put, there hasn't been enough data, and where data has been available it has been presented to the market in an inconsistent and impenetrable manner. Vendors provided black box data, whereby it was difficult to understand the data sources and the model, or provided simply security data and ratings that were - and remain - difficult to put into context. Those vendors were pioneering, but we now know that as the cyberinsurance market has grown and evolved, the insurance industry has a better idea of what it wants and needs: more data, better explanation of data sources and models, with more flexibility of consumption to meet the needs of not only the largest (re)insurers and brokers but also smaller brokers and agents too i.e., the ingredients for everyone to understand cyber. That's exactly what Corax is providing.

#### 5. In addition to innovative models, new products, and cyber-landscape monitoring, what other capabilities do you think less-established businesses can bring to the table?

I see a need for better automated external gathering of inside, or so called “behind the firewall” data about companies, for example, technical security controls, like whether multi-factor authentication is being used, or non-technical security controls, such as physical barriers and policies. The cyber/physical overlap means there is definitely a need for automated identification of physical security vulnerabilities of company offices and buildings. I also see a need for an innovative approach to company classification: traditional industry sector classifications are adequate, but mask the enormous differences - and similarities - between the key revenue-generating activities and systems of companies.

# InsurTech Company Profiles

## Innovative Solutions for an Industry Headache

*Providing Cyber Analytics Tools for (Re)Insurers and Brokers*

Analytics tools for  
the industry

corax

### 6. Do you believe that a lack of historical data and expertise on this topic makes for a more 'open playing field' for InsurTechs to potentially compete with the incumbents?

Yes, I think that's true because a lack of historical data has driven innovation to identify new sources of data and use them cleverly. A fast-moving market also favours smaller, more agile companies - we've certainly been nimble-footed and iterated our technology, our data and model multiple times.

### 7. What advice would you give to incumbent (re)insurance companies who are looking to write, or financially support, cyber in the future?

In order to make business decisions about their target markets and product offerings, incumbents looking to write cyber need a broad view of cyber risk analytics - looking at the security posture of organizations worldwide, across different market segments, geographies and so on. That's exactly the kind of business intelligence we can provide them with - we can provide a global view across the universe of millions of companies that we have modelled at Corax.

Partnering with managed service providers (MSPs) and the provision of risk management services are also two key considerations for writing cyber in the future. This is particularly relevant to the SME market, which, within reason, will seek to transfer risk and rely on their third party IT providers to action key security recommendations on their behalf. For incumbents who are, seeking to grow cyber business from the SME market, working with MSPs is a must.

### 8. What types of data should the market be capturing to try and improve its ability to understand the threat, and price cyber products?

There's no doubt that loss data is important, and the market should continue to work on capturing it and sharing it. What's equally important is establishing a correlation between loss data and the technology and security posture of companies - which is what we do. In general when it comes to data for cyber, we do the heavy lifting of data capture so they don't necessarily have to! Firstly, with cyber, deciding what data sources to use requires expert security and technology knowledge. Secondly, we help clients answer the 'So what?' question. For example, although there are a lot of high quality sources of threat intelligence providing in-depth data, it is a huge and complex process to analyze that data, and put it into context.

### 9. Do you think that the proliferation of IoT devices and sensors will make the ability to properly underwrite cyber even more difficult? How are you planning to tackle the growing number of potentially vulnerable interconnected devices?

The Internet of Things certainly increases complexity and presents a huge challenge because there'll be the inevitable proliferation of data points to be collected. But on the other hand it presents an opportunity - there'll be great potential for telematics. It will essentially force the industry to take a very data driven approach to insurance, which is the way it should be.

In terms of how we tackle this at Corax, our platform is built with integration in mind - so we'll seek to partner with third party data sources that could be integrated with the Corax platform. We'll also continue to develop our own proprietary IP to tackle this issue.



# InsurTech Company Profiles

## Innovative Solutions for an Industry Headache

Providing Business-Centric Tools to Detect, Protect and Transfer Cyber Risks



Based in San Francisco and founded in 2017 by Han Wang, a Captain in the U.S. Army Reserve Cyber Command, Paladin Cyber is an InsurTech start-up that is focused on providing a robust cyber protection for SMEs.

Today the number one target of cyberattacks is small and midsize businesses. There are nearly 4,000 cyberattacks every day, and over 50% of them are targeted at small businesses. But only 5% of SMEs actually have any type of dedicated cyber protection. The majority of cyber solutions are focused on enterprise companies, leaving a large gap to fill to help small businesses.

The mind-set of SMEs is different from large enterprises. SMEs want three things when it comes to mitigating their cyber risk. They want to avoid being hacked entirely, they want to have someone to call if they are hacked, and they want to reduce their financial loss as much as possible.

While there are some solutions available, the majority of them only offer a solution to one of these challenges, and then companies must piece together other options to

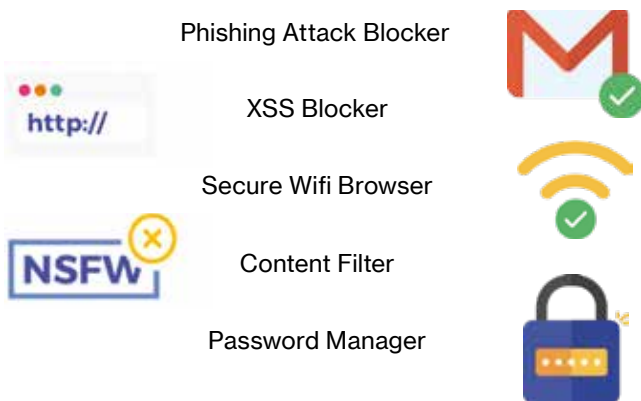
build their cyber protection platform. Solutions fall flat and SMEs are left with gaps in their cyber risk coverage.

Paladin takes a different approach. Using its proprietary natural language analysis and network security platform, Paladin identifies SMEs' real risks and combines multiple risk mitigation solutions into one easy-to-deploy platform.

With Paladin's cyber protection platform, SMEs receive all the protection they need at a fraction of the price. They receive a robust protection suite to guard their inbox and browser, as well as training and simulations for their employees. They get access to a 24/7 cyber response team made up of industry experts. SMEs also receive an admitted cyberinsurance policy that helps lower their financial cost. All this with the goal of helping SMEs minimize disruption and get back to running their business faster in the event of a cyber security breach.

Since forming in 2017, Paladin has launched in five states and is continuing rollout throughout 2019.

### Paladin Protection Software Provides:



### Investors

▪ <b>Argo Ventures</b>	▪ <b>GroundUp Ventures</b>
▪ <b>Aquiline Technology Growth</b>	▪ <b>Sutardja Ventures</b>
▪ <b>Lightbank</b>	▪ <b>Y Combinator</b>
▪ <b>Haystack Fund</b>	▪ <b>Clocktower Technology Ventures</b>
▪ <b>Hemi Ventures</b>	



# InsurTech Company Profiles

## Innovative Solutions for an Industry Headache

Providing Business-Centric Tools to Detect, Protect and Transfer Cyber Risks

Protection for commercial businesses



### Han Wang – CEO



- Han is an Army reserve officer and graduate of Stanford University with a M.S. in Computational and Mathematical Engineering.
- While deployed with the Army, Han served as the OIC (Officer in Charge) of the Southwest Asia Cyber Center's Cyber Assistance Team performing cyber security missions across Iraq, Kuwait, Saudi Arabia, Bahrain, Jordan, Qatar and UAE.
- After returning home, Han founded Paladin Cyber with the mission of protecting businesses back with military grade security backed up by insurance.

### 1. How did the concept for Paladin Cyber take shape? Why do you think that SMEs are increasingly more vulnerable to cyberattacks than other companies?

The idea came to me when I was running a cyber field team while on deployment to the Middle East with the U.S. Army. I saw how effective Department of Defence's in-depth approach to security was and wanted to bring a cost-effective version to market for SMEs. Today, this is absolutely critical as SMEs are the least protected businesses against cyber exposures. And the statistics are grim: 60% of SMEs hit with a cyberattack go out of business in six months.

### 2. Your model moves away from the traditional ways of interacting with risk and establishing a more proactive approach to risk management. How successful have these been in reducing risk?

Our security suite covers 99% of attack vectors aimed at SMEs with a special emphasis on phishing, which accounts for 91% of attacks. In a standard phishing attack, we flag the email when it lands in the inbox, block the loading of the phishing page if it is clicked, and our password manager prevents the release of credentials. Along with our weekly phishing simulations and online training modules, this puts a stop to the number one cyber threat facing SMEs today.

That stated, we're not at all a one-trick pony: Our security suite also covers cross-site scripting (XSS), tunneling HTTP over encryption, web filter on IP/domain and content filtering.

### 3. What differentiates your pricing models for your customers? How have you established yourself alongside the incumbents?

Unlike the incumbents, we have the ability to price based on verified controls. This reduces the friction of the application process while increasing the reliability of core underwriting data.

### 4. Paladin Cyber insures business against financial loss – how does this account for reputational damage to a company, liability concerns or lawsuits?

We provide business interruption, computer fraud, system restoration, digital forensics, first- and third-party liability along with public relations expenses for policyholders that suffer a breach. We also recognize that companies will suffer some consequential customer loss and reputation damage after a hack, but having the right team available immediately to help manage the loss and control the messaging can go a long way to mitigate the impact.

### 5. Could you expand on how the support from Boost helped build out and develop Paladin's cyber offering?

Alex Maffeo (founder of Boost) and the Boost team have been a great help in coordinating between State National and our reinsurers. They also provided a great deal of input during the product design process and have played a role in crafting our admitted filings along with Perr & Knight.

# InsurTech Company Profiles

## Innovative Solutions for an Industry Headache

Providing Business-Centric Tools to Detect, Protect and Transfer  
Cyber Risks

Protection for commercial  
businesses



### 6. With the increased penetration of connected devices, agile working and wireless connectivity there is greater vulnerability or points for attack. Could you elaborate on how Paladin Cyber's model account for this?

Our team has been focusing on this trend and our software is fully geared towards a cloud-delivered workspace. We anticipate that productivity software will be all SaaS based in the next five years, so if you can secure the browser and the network connection, you've secured the user.

Specifically, our tunneling technology ensures that all web traffic leaving a laptop is encrypted in a TLS tunnel. Thus, even users accessing the Internet through a public hotspot will be secure. Additionally, our web and content filtering software is delivered at the browser level, so users do not need to sit behind a corporate firewall to be protected.

### 7. Do you think that the current system of annual policies is the correct way to interact with a risk that is constantly changing and morphing? What would be the ideal cyberinsurance policy in your eyes? Would it be established on an open insurance model?

Going to shorter policy cycles will definitely benefit the industry. Personally, I think monthly durations, similar to other SaaS products, may make the most sense. I believe on-demand cyberinsurance will add friction to the customer while making underwriters happy. However, the market ultimately will determine what is sustainable in the long run.

A common-sense test for a cyberinsurance policy should cover all the aspects of cyber that the layman believes falls under "hacking." To be precise, this would include first- and third-party liability, forensics, system restoration, computer fraud and fines. In addition, to help prevent an insured from going out of business after the claim, cyber policies should also cover business interruption and related public relations/crisis communication assistance.

Given the prevalence of cyberattacks in today's society, I'm certain policy coverages ultimately will become standardized and converge as has been the case with CGL and workers' compensation.

### 8. Please comment on how you see the future of the cyber market? Do you see cyberinsurance becoming as ubiquitous as say property insurance?

There's no question, I do and the rest of the industry agrees. It's not rational to envision a robust digital economy without insurance for cyber risks. In terms of cyber coverage, we're seeing just the tip of the iceberg of the market right now.

### 9. Why do you think the incumbent market has struggled with the issue of cyber? Is this something that businesses such as yours can help to improve?

I think the challenges facing the market have been twofold. First, there is a conservative attitude in underwriting risks that are not fully understood. And that's manifested in the variance in pricing and coverage we've seen in the marketplace – although that's been stabilizing in the past year or so. Second, and compounded with the previous issue, is the fact that IT issues tend to be more nuanced. Unlike well-defined flood plains and fire hazards, cyber risks shift with employee behavior and every new version of software used. Without integration with end-user software, the data required to drive effective underwriting may also be fraught with uncertainty.

We're tackling both issues by creating software security controls in-house. That way, we can deliver a homogenous book of risks to underwriters and stand by the certainty of the data they use for underwriting purposes.

### 10. Where do you see your business, in say five years' time?

We see ourselves powering security solutions in SMEs across all 50 states. By creating an easy-to-adopt solution that fully handles the cyber threat for a fixed known cost, we remove the uncertainty from business owners and make cyber another manageable accounting line item.

# InsurTech Company Profiles

## Innovative Solutions for an Industry Headache

Providing Business-Centric Tools to Detect, Protect and Transfer  
Cyber Risks

Protection for commercial  
businesses



### 11. In addition to innovative models, new products, and cyber-landscape monitoring, what other capabilities do you think less-established businesses can bring to the table?

I think there's a great deal of value add in automated devOps, which lower the bar for implementing security whether across websites or other hosting solutions.

### 12. Do you believe that a lack of historical data and expertise on this topic makes for a more open playing field for InsurTechs to potentially compete with the incumbents?

Absolutely, although I would caveat that most InsurTech advantage in this space will come from our abilities to draw and analyze network traffic data. Incumbent insurers currently have – and will continue to have – the best claims data on cyber for the foreseeable future.

### 13. What advice would you give to incumbents who are looking to write cyber in the future?

I would advise them to verify the underwriting data they're getting regarding the prospect's IT systems, controls, and SaaS software used. Often, this information is incorrect – not through malfeasance but rather as a result of sheer ignorance. In fact, IT personnel may not know about all the software and workflow habits of the employees, especially given the growing prevalence of SaaS products.

### 14. What types of data should the market be capturing to try and improve its ability to understand the threat, and price cyber products?

The market should be capturing user browsing behavior that falls outside of commonly accessed sites; the frequency of this activity is highly correlated with new phishing or exfiltration efforts. At the end of the day, the vast majority of SMEs are not hosting bare metal servers, but leveraging SaaS and other cloud services to deliver their website, email and productivity suite. Understanding how these services interplay with each other and when user behavior fall outside this scope will be key to understanding the frequency and severity of incidents a company will face.

# InsurTech Company Profiles

## Innovative Solutions for an Industry Headache

Providing End-to-End Solutions to Help Businesses Drive Their Cyber Risk to Zero



Zeguro is a cyber security and cyberinsurance company focused on small and midsize enterprises. Based in San Francisco, Zeguro is changing the way SMEs approach cyber safety, through its Virtual Cybersecurity Officer platform – combining risk assessment, mitigation, and insurance.

Cyber risk is a problem shared by everyone in this digital age. Zeguro provides the tools and training to manage and monitor security continuously, without the overhead of consultants and security executives. Its virtual cybersecurity platform identifies risks and mitigates them with technology, training and process. In addition, Zeguro maintains compliance with data regulations and contractual obligations.

Hackers and cyberattackers never rest – if they succeed, Zeguro's tailored cyberinsurance will help its customer's business recover with minimal disruption. Ongoing assessment, mitigation and remediation for small and midsize enterprises keeps risk, and premiums, in check.

### Zeguro's SaaS Platform's Capabilities



#### Continuous Cyber Risk Monitoring

Protect external digital assets from cyber attacks, and cloud based productivity tools from errors and security risks.



#### Targeted Employee Training

Prepare your team for ransomware scams, password management, phishing schemes, and more.



#### Automated Web Vulnerability Testing

Ongoing site scans for known vulnerabilities, outdated software and configuration errors.



#### Continuous Cyber Risk Monitoring

We provide the "to-do" list and audit trail for you to remain in lock step with current regulations



#### Optional Cyber Insurance to Meet Your Needs

Zeguro's insurance policy is designed specifically for small to medium enterprises and is automatically tailored to your business.



### Assess

Continuous Monitoring

Data Collection



### Mitigate

Behavior Modification

Improved Security Posture



### Insure

AI-powered Risk & Pricing

Automated Underwriting

### Investors

- |   |  |   |
|---|--|---|
| <ul style="list-style-type: none"> <li>▪ Healthy Ventures</li> <li>▪ Sparkland Capital</li> <li>▪ QBE Ventures</li> <li>▪ Plug and Play Ventures</li> </ul> | <ul style="list-style-type: none"> <li>▪ Social Capital</li> <li>▪ Mosaik Partners</li> <li>▪ Munich Re/HSB Ventures</li> <li>▪ Startupbootcamp InsurTech</li> </ul> | <ul style="list-style-type: none"> <li>▪ StartOut</li> <li>▪ Plug and Play Accelerator</li> </ul> |
|---|--|---|

# InsurTech Company Profiles

## Innovative Solutions for an Industry Headache

Providing End-to-End Solutions to Help Businesses Drive Their Cyber Risk to Zero

Mitigation tools for commercial businesses



### Sidd Gavirneni – CEO



- Prior to Zeguro, Sidd was managing Polycom's product portfolio while serving on its Information Security Board. He was also a portfolio consultant to security companies after a career as a software engineer. Sidd holds an M.B.A. from IE Business School in Spain and a Masters in Computer Science focused on information security.
- Dan is a third generation entrepreneur who has worked on many sides of the information security challenge. In his native Australia, Dan's security engineering and architecture experience with government and corporate entities led to co-founding a number of companies there in the security and services space. Upon moving to the U.S., he applied that experience to security and infrastructure management at First Republic Bank and a number of high-tech companies.

### Dan Smith – COO and President



### 1. How did the concept for Zeguro take shape? Why do you think that SMEs are increasingly more vulnerable to a cyberattack than in other industries?

Zeguro was founded on the triangulation of three events. First, co-founder Sidd Gavirneni found himself dealing with the complications of settling a claim on a data breach and was tasked with dealing with the cyberinsurance company. This was a painful task because of all the in-house efforts to coordinate the tasks across PR, legal, forensic teams, and others involved with breach response. Meanwhile, co-founder Dan Smith was navigating the complexity of renewing cyberinsurance at a large bank. It took him and his team three months to get a quote from the insurer, in part, because of the insurance broker and also because of the exhaustive data requirements that were requested by the insurers.

The most telling of this string of events was a hack on a friend's livelihood. A friend who ran her own medical practice had experienced a breach as a result of a technique called "spear phishing." The hackers used the data they accessed to file tax returns on behalf of all employees. As the practice did not have cyberinsurance, the firm had to reimburse all of their employees for legal and other expenses out of their own pocket, at a very high cost relative to their normal operating budget. It almost put them under.

These unrelated incidents signaled to us that cyberinsurance, and monitoring of cyberattacks, were critical to businesses of all sizes. But knowing that big companies had the resources and advanced processes to handle cyber led them to focus on smaller companies. SMEs are much more likely to be attacked, and the impact on their business is proportionally much greater.

### 2. How should companies think about risk differently when it comes to information security versus risk in general?

Most organizations still do not have a good understanding of the components of cyber risk. To add to that, there is an overwhelming shortage of cybersecurity professionals. There are an infinite number of threat vectors when it comes to cyber risk, and it is critical that businesses realize and internalize this new reality, not ignore it. This means being aware of how risks present themselves, staying on top of regulations that require compliance, and making sure that employees know that they are a key element of the risk profile. Clicking on the wrong email is one of the easiest ways to be hacked. The insurance industry has the power and money to increase awareness of these risks, and play a critical role in helping these businesses avoid or survive an attack.

### 3. How has your capacity partnership with Munich Re and HSB helped build out and develop Zeguro's offering? Was the ambition always to incorporate an insurance offering?

Zeguro's business is predicated on having both our cyber risk management platform and our insurance work in tandem to protect businesses. Similar to the trends in auto and home insurance, the future of cyberinsurance policies is based on the system being aware of the actions a company takes to protect itself. The advantage of working with HSB and Munich Re is that they validated our approach, provided capacity, and enabled us to provide a unique product that fits the specific needs of each small and midsize enterprise.

# InsurTech Company Profiles

## Innovative Solutions for an Industry Headache

Providing End-to-End Solutions to Help Businesses Drive Their Cyber Risk to Zero

Mitigation tools for  
commercial businesses



### 4. Do you think that the current system of annual policies is the correct way to interact with a risk that is constantly changing and morphing? What would be the ideal cyberinsurance policy in your eyes? Would it be established on an open insurance model?

There is value to an annual policy, especially for the buyer. An annual premium gives them a predictable budget in order to best plan for their business. The idea that a policy could go up in price based on something other than a specific claim could be a nightmare for a smaller company. Of course, they would love to see their premium drop, but for that to happen we need to observe consistent behavior and reward those actions at the end of a cycle. That could be a six month cycle in the near term, maybe eventually a quarterly cycle. But until the industry has a comfort level with the liability inherent in cyber policies, it is better for both sides to remain on a consistent cycle.

Open insurance makes more sense when insuring devices, health or autos where there is a greater maturity of understanding how actions lead to changes in the insured's risk profile. There is value to being able to add or subtract products based on changing needs. In the case of business insurance and cyber in particular, there are products like Tech E&O, and even device-level policies, that could be added or subtracted from a company without having to re-price the annual offering.

### 5. Please comment on how you see the future of the cyber market? Do you see cyberinsurance becoming as ubiquitous as property insurance?

The need for cyberinsurance is growing daily. It is now more prevalent than ever in contractual requirements for vendors to large companies. We see it becoming an important line item for guaranteeing loans, hiring and managing employees, and as a core component of compliance as demands from regulations like GDPR and CPA take hold. The question in businesses' minds is going to quickly shift from "do I need it?" to "who offer the best policy and protection for my business?"

### 6. Why do you think the incumbent market has struggled with the issue of cyber? Is this something that businesses such as yours can help to improve?

The real underlying issue with cyber is that there is not yet enough data for incumbents to accurately model their liability, leading to poor policy structures, high pricing, or insufficient coverage. Zeguro, by being small, nimble, and focused on collecting quality data, can improve all of those things for our customers and for our insurance partners. Also, as insurers it is a difficult shift for incumbents to be able to portray themselves as risk management companies - start-ups like us have the advantage of creating that brand image and value from the ground up.

### 7. In addition to innovative models, new products, and cyber-landscape monitoring, what other capabilities do you think less-established businesses can bring to the table?

Incumbents have a huge, embedded marketing and sales structure to support. But start-ups like us don't. This enables us to be nimble and tailor our message and offering more quickly to the needs of the market. We can thus build a brand aligned with the audience we are targeting - in our case small and midsize businesses that are faced with cyber risk. This also allows us to align with other start-ups to provide complimentary products to similar customer segments. This can be a great differentiator for us all.

### 8. Do you believe that a lack of historical data and expertise on this topic makes for a more 'open playing field' for InsurTechs to potentially compete with the incumbents?

There are many factors that are creating an open playing field - the lack of data, the lack of awareness, and the problems with cyberinsurance distribution to date. We are building Zeguro to be a successful and sustainable enterprise. And the key to that is to simplify cyberinsurance and to make the data useful both to optimize premiums and to accelerate and curate product development to offer policies that are specifically designed for a customer's evolving business needs. Having an early start in understanding and applying the data will help us drive change and create a new competitive dynamic in the industry.



# InsurTech Company Profiles

## Innovative Solutions for an Industry Headache

Providing End-to-End Solutions to Help Businesses Drive Their Cyber Risk to Zero

Mitigation tools for  
commercial businesses



### 9. What advice would you give to incumbents who are looking to write cyber in the future?

There will be plenty of room to write cyber at the enterprise level, at the consumer level, and at our SMB level. I would request incumbents to continue to refine their cyber offering while keeping their customers' unique needs in mind.

### 10. Do you think that the proliferation of IoT devices and sensors will make the ability to properly underwrite cyber even more difficult? How are you planning to tackle the growing number of potentially vulnerable interconnected devices?

"Connected Insurance" today, is primarily being talked about in the context of home and auto insurance. The industry must recognize that cyberinsurance is, and should be the most connected form of insurance. Devices, especially connected devices, definitely make cyber more complex, and more important. Pricing those policies and determining the endpoints that could cause infiltration are important to the broader cyber discussion, and make underwriting a bigger challenge.

The number of endpoints that leave a company exposed continue to grow, especially as these endpoints include sharable and transmittable capabilities (like the Apple watch). The magnitude of connected devices is exploding, and each one of them needs to be assessed for its potential to expose a company's data. Innocent devices like fitbits and Bluetooth speakers run the risk of being tapped by hackers. Data sent in an email or over a conference call could be hijacked on the way to its proper destination from such devices. If each device that enters the building is made aware to the company, and its usage understood, it makes a company stronger as workers opt to bring three or four devices to work every day. In most cases, they don't know or appreciate the vulnerability they are carrying in their pocket, or creating when they work from home.

# InsurTech Company Profiles

## Innovative Solutions for an Industry Headache

Providing Technical Expert Vetting of Firmware

Technical expertise in  
firmware vetting



Founded in 2017 by Terry Dunlap and Peter Eacman, Baltimore-based ReFirm Labs is a company that specializes in vetting and validating firmware and IoT device vulnerabilities.

We live in a world of connected embedded devices. Newer Internet of Things (IoT) devices capture the spotlight with the promise of transforming industries and changing the way we live. Out of the spotlight, legacy devices control the power grid, transportation infrastructure, medical procedures, and touch almost every aspect of daily life. Our reliance on connected devices continues to rise; securing these devices is critical.

IoT security is finally receiving necessary attention. IoT security companies are being founded. Incumbent suppliers are investing in new products and technologies for IoT security. Conferences are devoted to this topic. Despite all the talk, there is a steady increase in the number of successful attacks on connected devices.

ReFirm Labs has created a firmware and IoT testing business that can validate the strength of protection and determine weaknesses in interconnected systems.

ReFirm Labs has also launched its Centrifuge Platform, which automatically detects security vulnerabilities in the firmware that runs billions of Internet of Things (IoT) devices, consumer electronics and other connected enterprise machines.

This type of service provision is a key component of the broader cyber offering required to properly understand and finance this risk class.

### Connected IoT Device Security – Why Firmware Vulnerabilities Matter



Understanding security risks is critical to protecting the IoT.

### Making Devices Secure



Weak  
Authentication

Hidden  
Back-Doors



# Password  
Hashes Stored  
in Firmware

Encryption  
Keys Stored  
in Firmware



Buffer Overflows  
Vulnerabilities



Open Source  
Solutions w/Known  
Vulnerabilities



Debug Services  
in Production  
Systems



#### KEY FEATURES

1. Discover known and unknown vulnerabilities with NO SOURCECODE or AGENTS.
2. Continuous monitoring to keep on top of new threats
3. Ranked list of vulnerabilities to address the most urgent issues first
4. Quick: requires less than 30 minutes for a full analysis
5. Detailed and actionable reporting that makes it easy to find & fix vulnerabilities
6. Simple integration: API can be incorporated into existing third-party tools and workflows

# InsurTech Company Profiles

## Innovative Solutions for an Industry Headache

Providing Technical Expert Vetting of Firmware

Technical expertise in  
firmware vetting



### Terry Dunlap – Co-Founder



- Terry spent over five years as an offensive cyber operator with the U.S. National Security Agency (NSA) before starting his first company, Tactical Network Solutions (TNS) in 2007.
- In 2017 he created ReFirm Labs, which specializes in cyber risk mitigation of IoT and other connected devices.
- Terry earned a Master of Science in Network Security from Capitol College (now Capitol Technology University) and a Bachelor of Arts in Political Science and Economics from Case Western Reserve University

### 1. How did the concept for ReFirm Labs take shape? What forces led you to believe that IoT was a significant area of cyber vulnerability?

ReFirm Labs is comprised of former offensive cyber operators from the U.S. National Security Agency. Our job was to find ways to penetrate the networks of foreign adversaries for intelligence and military purposes. We did that by focusing on discovering and weaponizing vulnerabilities in the firmware of connected devices like cameras, printers, modems, WiFi routers, etc. Basically all the things we now call "IoT."

Given our decades of experience dealing with vulnerabilities in the firmware of IoT devices and the exponential growth in the adoption of IoT devices, we thought the time was right to leverage our knowledge in helping customers protect themselves from foreign actors, hackers, and criminals. Basically, protecting customers from people like us!

### 2. Why did you choose to create an additional platform and not directly integrate or consult the existing IoT network?

Currently, there is no platform in the world like the Centrifuge Platform™ that can do what we do with IoT and connected devices: identify backdoors, reveal passwords, discover potential zero-day vulnerabilities, etc. and then continuously monitor those devices without access to source code, without the need for agents on the device or network, and without the need for special SDKs.

### 3. IoT is on track to reach 34 billion devices by 2020. Can you expand on how ReFirm Labs is remaining one step ahead of the potential vulnerabilities? And how are you ensuring that your platform is able to adapt and evolve to these new products and risks?

Vulnerabilities exist for one of two reasons: (1) accidental backdoor accounts left in production by test engineers (sometimes we find malicious backdoors installed by questionable manufacturers), or (2) sloppy, insecure coding practices that lead to exploitable vulnerabilities like buffer overflows or command injection attacks.

The Centrifuge Platform™ is a cloud-based SaaS solution that can easily scale as IoT devices proliferate the planet. And our team keeps tabs on the IoT ecosystem by monitoring development trends. For example, we plan to expand our platform to include coverage of real time operating systems (RTOS) which run many of the world's SCADA and ICS components.

### 4. What role do you see insurance playing in the rapidly evolving cyber space? Do you see insurance as a crucial instrument for companies and individuals and to ensure that they can remain resilient in the face of cyber threats?

I believe cyberinsurance can force companies to take a hard look at their security posture. Underwriters for cyber security policies will require various security tests, scans, policy reviews, etc. in order to underwrite a policy and charge accordingly based on the risk profile.

But I worry that cyber underwriters will only receive a partial risk profile as most "security assessments" I have seen are the run-of-the-mill penetration tests of the company. These types of assessments only scratch the surface. They lack visibility into the types of attack vectors determined adversaries and criminals will pursue, like firmware level attacks, sophisticated social engineering, and executive compromise.

#### 4. Cont.

For example, if I am a determined adversary I will figure out where some of the executives or management teams live. I will then follow their children and spouses to establish a pattern of life since they will likely be less Internet security savvy. Then I can attempt to exploit their phones, laptops, or even home networks to upload my firmware implants which will eventually find its way back to the company once the company executive connects to his or her home network. No amount of penetration testing of the company will reveal these types of vulnerabilities to the underwriters.

#### 5. Is insurance a potential avenue for expansion of ReFirm Labs? Will ReFirm Labs integrate with the insurance space?

Indeed. Insurance was not an initial market for us since we thought OEMs and ODMs of IoT and connected devices were the market. But it was by complete chance when we met with Allianz that our eyes were opened to a whole new market for our technology and skill set.

Now we're actively exploring opportunities with various insurance companies. And we welcome others interested in exploring ways to better understand cyber risk mitigation.

#### 6. DataTribe holds a corporate minority interest in ReFirm Labs – can you elaborate on how this partnership has shaped your business development?

Without DataTribe, we would not have launched ReFirm Labs. DataTribe provided \$1.5 million in an initial seed round. And they've been instrumental in connecting us to Silicon Valley venture capital. They were also responsible for introducing us to Allianz. Without that introduction, we would have never discovered a need for our technology within the insurance vertical.

#### 7. Where do you see ReFirm Labs in say 5 years' time? Is the ambition for ReFirm Labs software to become a compulsory addition to all IoT devices?

I see ReFirm Labs and the Centrifuge Platform™ becoming the gold standard for any cyber underwriting with coverage of IoT and connected devices.

While I do not see us becoming a compulsory addition to all IoT devices, I do see cyber underwriters mandating to customers, as a condition of the underwriting process, that they must submit a Centrifuge report to prove their IoT and connected devices are indeed secure all the way down to the firmware level. And as a condition of continued coverage, customers must opt-in to Centrifuge Guardian™, the real-time monitoring of firmware.

The advantage of this, to both the insured and insurer, is that when a new vulnerability is discovered that impacts the IoT or connected devices of the insured, each party is notified. Therefore, the parties jointly know that a new firmware patch or upgrade is necessary. If the insured fails to update the firmware then suffers a breach or attack in the future and attempts to file a claim, the insurer can easily ascertain if the firmware was ever updated or patched with our Centrifuge Guardian™ technology.

#### 8. Do you believe that a lack of historical data and expertise on this topic makes for a more open playing field for InsurTechs to potentially compete with the incumbents?

Absolutely. It's a new frontier. And what makes it exciting is that there are no preconceived notions of how things should be done. You're free to experiment and push the boundaries. Sometimes ignorance is indeed bliss! Had I known what I know now: the ups and downs of starting a business, the challenges I have faced, etc. I'm not sure I would have taken the chance to launch ReFirm Labs. It would have seemed overwhelming.

### 9. What advice would you give to incumbents who are looking to write cyber in the future?

Make sure you get the full picture when underwriting cyber policies. As I mentioned previously, you need more than a traditional network security assessment or penetration test. The attack vectors today are multi-faceted and no longer one-dimensional (i.e. only coming in from the network). True risk mitigation may require multiple third-party partners each with their own unique capabilities and methods of risk assessment. Get as close to a full risk picture as possible. Now we're actively exploring opportunities with various insurance companies. And we welcome others interested in exploring ways to better understand cyber risk mitigation.

### 10. What types of data should the market be capturing to try and improve its ability to understand the threat, and price cyber products?

Since we deal primarily with firmware level attacks where adversaries can easily implant themselves with relative ease and go undetected for years, I would like to see a searchable database of IoT makes and models. With such a database, ReFirm Labs would be able to run an analysis on the historical vulnerabilities within the firmware images of these vendors. Each vendor could then be ranked as to their historical security posture with firmware. Think of this database like your credit score. It's a ranking of how responsible you've been with your firmware development practices much like your financial responsibility with credit. If your firmware has been found to be lacking in security over the years, your score will be low.

A database like this would be another component in the cyber underwriting process much like our credit report is pulled and a review of filed claims performed when we seek automobile insurance. In fact, ReFirm Labs has already embarked on building this database by collecting terabytes of firmware images from a large collection of IoT and connected device manufactures around the world.

### 11. Do you think that the proliferation of IoT devices and sensors will make the ability to properly underwrite cyber even more difficult? How are you planning to tackle the growing number of potentially vulnerable interconnected devices?

If underwriters use platforms like our Centrifuge Platform™ or require the insured to submit a report from our platform indicating a clean bill of cyber health, then I don't see the proliferation becoming an obstacle. As for how we plan to tackle the growing number of devices, I will refer to my previous answer about vulnerabilities and scalability.



# Transaction Spotlight

## Europe's First InsurTech Initial Public Offering (IPO) – Deutsche Familienversicherung



### Europe's First IPO

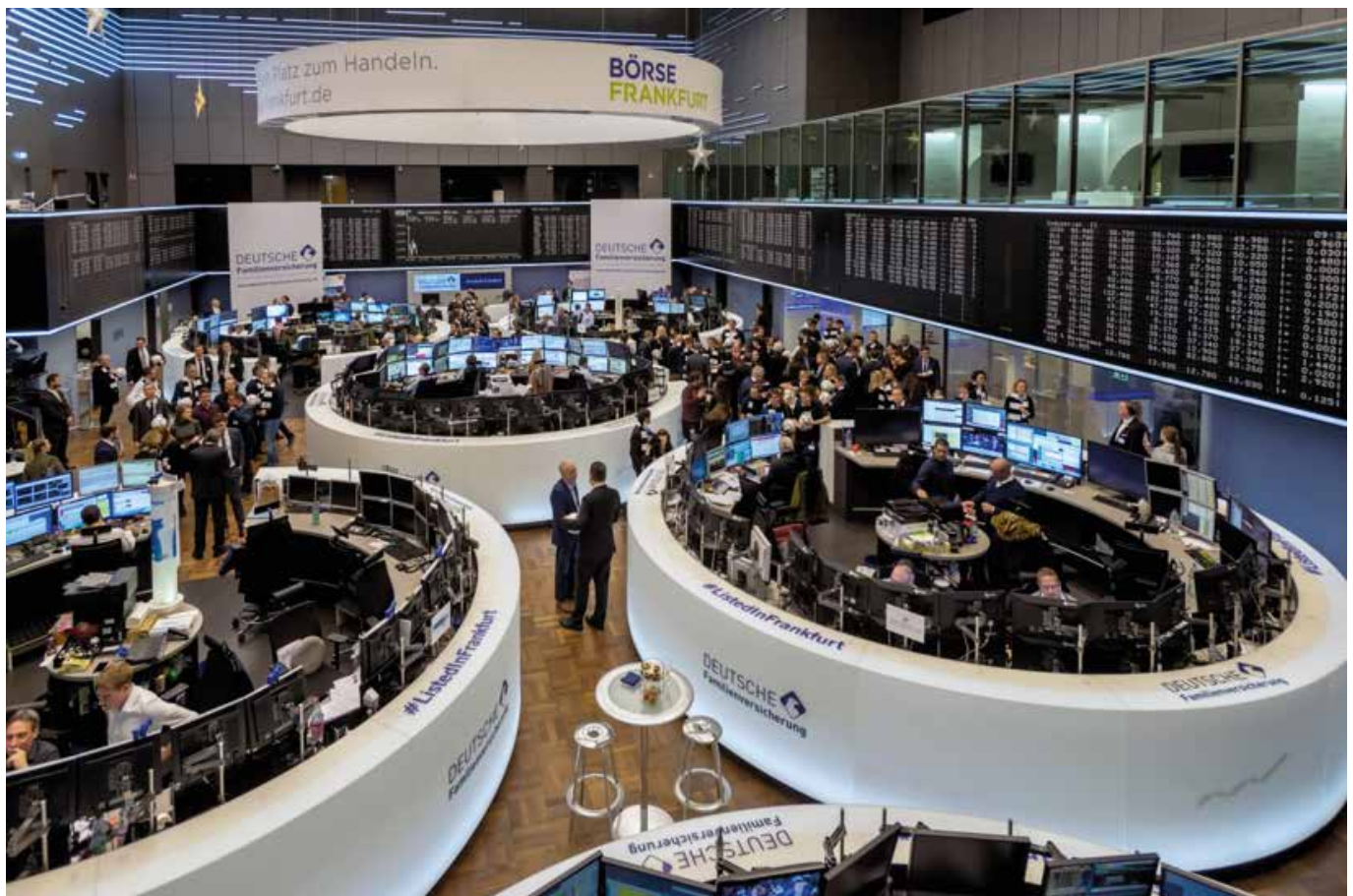
On December 4th 2018, Deutsche Familienversicherung (DFV) became the first InsurTech IPO in Europe, raising €52 million. In doing so, they joined an elite club of only three InsurTechs globally to have done so, the other two being ZhongAn, the China-based digital P&C insurer who raised \$1.5 billion in September 2017 and EverQuote, the U.S.-based online insurance marketplace who, in June 2018, raised \$84 million.

The raised funds will expedite DFV's expansion plans through investment in its sales and marketing strategies. DFV is still largely a niche player in the German health and property space, which is dominated by the likes of Allianz. It, however, sees its offering as the new kind of insurer and one which will be a market leader in the future.

DFV's value proposition is founded on the premise that insurance should be simple and sensible and supported by a scalable digital platform. For DFV, this has seen

the development of an insurance offering that delivers transparent, responsive and flexible supplemental health insurance products to each consumer, all through an AI-driven, real-time digital platform and extends from customer acquisition to claims. DFV strips back the complexities of traditional insurance offerings and condenses it down to a 16 grid matrix. This customer-centric approach allows the customer to turn up and down the dial of coverage by moving along the groupings.

### Customer consulting – Online and digital





# Transaction Spotlight

## Europe's First InsurTech Initial Public Offering (IPO) – Deutsche Familienversicherung

### “Alexa, buy me travel insurance?”

Central to DFV's value offering is the customer. As activities such as buying clothes online becomes easier and the digitization of many consumer industries becomes commonplace, consumers expect this to transcend to across the value chain. This expectation has already impacted the insurance industry – think price comparison websites and claim automation through photos.

DFV has embodied this and is working to offer its customers a seamless digital journey. It is the first insurance company in Europe to offer customers the option of communicating with them through Amazon Alexa. This extends from receiving advice to executing insurance contracts in seconds and can be paid for through traditional methods, as well as Amazon Pay and PayPal.

The collaboration with Alexa positions DFV at the forefront of digital innovation and with a recent study stating that roughly one in five Germans under the age of 35 would consider purchasing an insurance contract through a digital assistance, this could see them capturing part of this underserved market. While the adoption of digital assistants remains relatively low, the number of digital voice assistants is expected to rise to 275 million by 2023, an increase of 1000% from 2018. DFV has recognized this trend and looking to capitalize on it to expand their customer base.

### Digital but delivering?

DFV has successfully created a flexible, cost-effective digital insurance platform which delivers products quickly to customers. Through its flexible interfaces, DFV can launch new products within days and key features of these can be modified in real-time, matching consumer demand.

Notably, DFV's model relies heavily on digital sales, emphasized by the collaboration with Alexa. This drastically reduces customer acquisition costs and means that each new customer, comparative to their peers, represents a significant positive net present value. (DFV calculates its need to invest 12-14 monthly premiums to acquire a new customer, versus 29-35 their incumbent peer group.) Likewise, this decreases DFV's commission payments and further reduces customer acquisition costs.



### DFV's Ambition

The recent IPO marks a more noticeable transition in DFV's strategy and one which emphasizes its desire to expand its market presence and new sales streams - DFV anticipate that they will gain 100,000 new customers by the end of 2019.

# Thought Leadership

## Cyber – Opportunity or Threat?



**Mark Synnott**

Global Head of Cyber  
Willis Re

Over the past decade, cyber insurance has grown rapidly from a specialist line focused primarily on data breach to a complex mix of exposures that extend to include business interruption and ransom and potentially spill over into a wide range of insurance lines. As we become increasingly dependent on digital technology, this growth is only going to accelerate.

The opportunities presented by cyber are clear. Worldwide premium income is projected to double to \$7.5 billion over the next two years and some see this figure more than tripling to \$25 billion by 2025. Experience to date has also been attractive, with many insurers recording loss ratios of 40 to 50%. However, there are threats. Malware attacks such as Wannacry and NotPetya in 2017 demonstrated the potential for contagion across multiple insureds and geographies from a cyber virus. These attacks also highlighted the potential for a broad range of insurance lines of business to be impacted by a cyber event, a phenomenon sometimes referred to as silent cyber – cyber exposure embedded in policies that were neither originally designed nor priced to afford cyber coverage.

Cyber, therefore, has an unknown and potentially sizable systemic or catastrophic component, which means that the attractive loss ratios experienced by many insurers to date may be misleading. Anyone writing hurricane or earthquake insurance will have attractive results until the wind blows or the earth shakes.

Determining whether cyber presents an opportunity or poses a threat is a challenge. Cyber as a line of business is relatively new and experience is scarce, so determining how much to charge for coverage is viewed by many as more art than science. Moreover, cyber is a man-made peril so the exposure landscape is constantly evolving – from data breach to ransomware to malware – as criminals look to monetize our dependence on digital technology and state actors look to inflict damage on their adversaries.

The experience of the past is therefore a poor guide for performance in the future. Most insurance policies were also drafted in the pre-digital era. Therefore, assessing whether silent cyber coverage exists here presents its own problems, especially in the absence of a strong body of case law to determine what is and is not covered in the event of a cyber-related loss.

*With their grounding in digitally-based solutions, InsurTechs are ideally placed to assist the insurance industry in addressing these and other cyber-related challenges.*

Cyber risk is based primarily on the vulnerability of digital systems to outside interference or penetration. Therefore, strong cyber security is key, and there are a range of cyber security firms that offer advice and protection to mitigate this risk. Some of these security firms also provide data and security ratings to help insurers assess exposure and price risk and a number of insurers have incorporated this data into pricing models as they formalize the underwriting process.

Some InsurTechs have developed their own underwriting models that incorporate a range of components including outside penetration testing, inside security assessment, and downtime and other damage variables to assist insurers in underwriting and pricing individual risks. A number of MGAs have also been established to take advantage of this technology or create their own models to underwrite cyber risk on behalf of third-party capital. Some of the third-party models have been extended to cover accumulation exposure and brokers too have got in on the individual risk and accumulation modeling act with their own models.

There is therefore a healthy ecosystem of InsurTechs, (re)insurers and brokers working to quantify and price for individual and portfolio cyber risk. However, most of this work relates primarily to cyber as a specific line of business rather than cyber as an exposure, which extends to include silent cyber. Existing levels of InsurTech and other modeling support to help assess silent cyber is much more limited. This should be a concern as the accumulation exposure presented by silent cyber potentially dwarfs that of cyber as a specific line of business. Moreover, the insurance industry can't claim ignorance on the issue.

# Thought Leadership

## Cyber – Opportunity or Threat?



As long ago as November 2016, the Prudential Regulatory Authority (PRA), the regulator in the U.K. responsible for insurance, sent out a directive that advised:

*"It is the PRA's view that the potential for a significant 'silent' cyberinsurance loss is increasing with time. As both 'silent' cyberinsurance awareness and the frequency of cyberattacks grow, so does the potential from 'silent' cyber exposures. Insurance firms may find it increasingly challenging to argue that all risks or other liability policies did not intend to cover this type of risk given the publicity and awareness of the issue."*

In order to address silent cyber, in an ideal world, insurers would update policy language to provide clarity of coverage. This has been done by some insurers, particularly in the specialty mutual sector, which differentiates itself by its quality of service and clarity of policy coverage. A number of insurers apply exclusions or offer sub-limits for cyber coverage under standard lines, but activity has been varied and in a competitive market most insurers are reluctant to be first movers for fear of losing out to competitors. Allianz is an exception here. In November 2018, its Global Corporate and Specialty unit advised that it will be updating coverage in 2019 to provide clarity so that physical damage and bodily injury arising from cyber events will generally continue to be covered under corporate, commercial and specialty policies, whereas cyber-related "pure financial loss" without physical damage or injury will be covered under specific cyber policies only. It will be interesting to see how this initiative progresses and whether it is followed by others.

As things currently stand though, there is a great deal of uncertainty in many lines about where cyber coverage begins and ends. Is physical loss or damage, or bodily injury covered when cyber is the proximate cause, and does this extend to financial loss?

*InsurTechs are helping insurers to assess this exposure.*

Several InsurTechs have developed software that deploys algorithms to analyze policy language to help insurers determine whether cyber coverage exists under various policy wordings.

From an accumulation standpoint, modeling firms are starting to extend their portfolio models to incorporate a measure for silent cyber, although this is primarily deterministic and scenario-related rather than probabilistic so there is no distribution of loss outcomes.

At **Willis Re**, we have also used the results from our Silent Cyber Survey to help parameterize a silent cyber module for our PRISM-Re cyber accumulation model, which incorporates both probabilistic and deterministic components. Because of the unknown and potentially sizable accumulation exposure, silent cyber is occupying multiple (re)insurance company stakeholders including regulators, rating agencies, boards of directors and senior management so there are plenty of incentives for InsurTechs to help (re)insurers get a better handle on their overall cyber exposures.

At some point, non-affirmative silent cyber coverage will migrate to become affirmative and, specifically, priced cyber coverage, either under separate coverage grants or sub-limits within traditional insurance lines or under stand-alone cyber policies.

Given the current weight of capital in the market, it may well take a large-scale catastrophic cyber event that impacts multiple lines and galvanizes all stakeholders to bring about such a change. At that point, we may well see cyber premiums mushroom up to and beyond even the most optimistic growth projections. In the interim, increasing levels of data will be deployed to inform cyber risk assessment at all levels so the market can better assess the opportunities presented by cyber as a line of business and the threats posed by cyber as a peril.

*InsurTechs will play an important role in harnessing this data to help inform insurers as the cyber market evolves.*

# The Data Center

## InsurTech by the Numbers

**Q4 deal count is up from Q3 levels but still down from Q1 and Q2.**

**63 InsurTech deals, with a total value of \$1.59 billion, were announced in Q4 2018.**

**Compared with Q4 of 2017, deal count in Q4 increased by 24%, while funding volume also increased by 155%**

- 63 transactions in Q4 2018 – higher than Q3, but lower than Q1 and Q2 2018, but higher than quarterly average of 2018 (51)
- U.K. investment down 9% from last quarter, with China the second largest investor for Q4 after the U.S. The U.K. has been responsible for 8% of total investment since 2012
- Investment from international markets remains strong; transactions outside of the U.S. account for 43% of total transactions since 2012 and 57% in the quarter
- While early-stage investments remain strong; Seed and Series A account for 64% of total transactions since 2012 and 62% this quarter (up 4% from last quarter). InsurTech funding is maturing to mid – and later-stages – 45% of financings in 2018 took place at the Series A, B, or C stages; this could lead to consolidation further up the chain

**P&C funding volume increased by 57% from Q3 2018 and increased by 89% from Q4 2017.**

- 41 P&C transactions in the quarter was only marginally higher than the 40 transactions in Q3 and marks a minor decrease from Q4 2017

**L&H funding volume increased by 1% from Q3 2018 but marked a 362% increase from Q4 2017.**

- Despite the Q4 deal count being lower than Q1 and Q2, Q4 2018 was the third-highest amount on record; pushing Q3 2018 into fourth largest
- **2018 hits record level of InsurTech investment, driven by large investments; deal count increased by 10% from Q3 2018 and funding volume increased by 26%**

Over \$4 billion invested in start-ups providing software to the (re)insurance industry or selling insurance digitally. The bulk of funding, over \$3 billion, was driven by 28 investments of over \$30 million each.

**Q4 saw six transaction reaching or exceeding \$40 million in funding; this is slightly down on Q3 (8).**

**The largest deal of the quarter was the \$500 million corporate minority stake investment in Cambridge Mobile Telematics, a provider of technology to convert raw sensor data into accurate inferences about device activity, by SoftBank Group.**

**The remaining +\$40 million transactions included:**

- Devoted Health's \$300 million Series B funding round, which brought total funding for the U.S.-based health-care company for seniors to \$369 million
- Bright Health's \$200 million Series C funding round, which brought total funding for the U.S.-based health insurance provider to \$440 million
- Prima Assicurazioni's private equity investment of \$116 million for the Italian-based online insurance company, from Blackstone Group and Goldman Sachs
- Hippo's \$70 million Series C funding round, which brought the home insurer's total funding to \$109 million
- Singapore Life's \$52 million Angel investment from Michael Spencer, which brought the life insurance company's total funding to \$122 million

**Technology investments by (re)insurers levels off**

- **After rising for several years, strategic investments by (re)insurers have moved down from Q2 2018's high (34). Q4 2018 recorded 31 investments; this represented a 6% decrease from Q4 2017 and a 19% increase from Q4 2016. There is however a significant increase in funding**

- **U.S.-based technology firms remain the number one targets with 32% of (re)insurer investments for the quarter; this is however a 18% decrease from Q3 2018**
- China-based firms received 20% of (re)insurer investments for the quarter, up 5% from Q4 2017. Germany-based firms received 16% up 7% from Q4 2017
- There was a significant increase in funding for Q4 2018, with 11 investments and funding total of \$218 million in the Seed and Series A funding rounds; this marks a 38% and 230% increase respectively from Q3 2018

# The Data Center

## InsurTech by the Numbers

### (Re)insurer partnerships remain steady

- **There were 31 strategic partnerships between (re)insurers and technology companies in this quarter, equalling Q3 2018 and the highest amount recorded by this publication**
  - Munich Re has partnered with Fraugster, an AI-based fraud detection product where Munich Re will reinsure Fraugster's Fraud Free product
  - TransRe have partnered with Concirrus to develop data-driven reinsurance insights, products, and services
  - AXA XL has formed a partnership with Parsyl, a supply chain data platform which offers enhanced marine risk prevention insights
  - Hannover Re has partnered with Life By Spot to launch short-duration, event-based life insurance policies, which range from 24-hours to 30-days
  - Hiscox signed a pan-European partnership which opens new distribution and service channels and allows them to expand their commercial and personal lines business

**Partnerships continue to grow** – Playing to the trend of InsurTech, playing the role of enabler, we continue to see strategic partnerships grow with over 30 in Q4'18 vs. 17 in Q1'17. Several (re)insurers have been more active than others here including Munich Re, XL, Swiss Re, and Allianz.

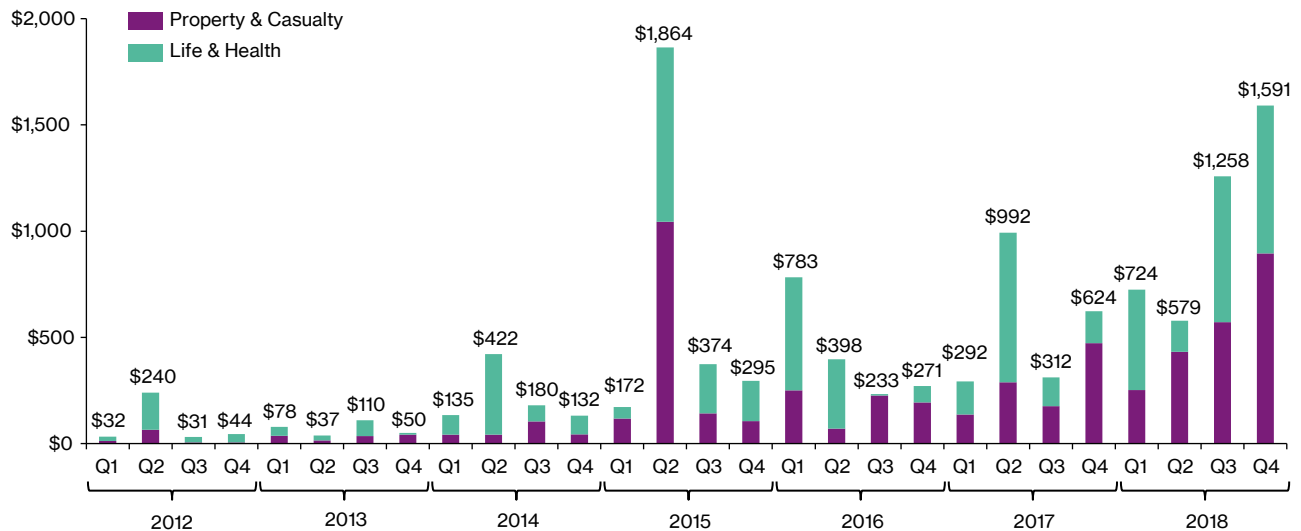
**Investments by (re)insurers level off** – After rising for several years, strategic investments by (re)insurers have ticked down from Q2'18's all-time high. While several firms such as AXA Venture Partners and Ping An Ventures remain active, others slowed their activity in the latter half of the year. Q4'18 did end the year with a couple strategic investments aimed toward growth in Asia including Aetna's investment in Singapore Life and Sun Life's investment in Hong Kong's Bowtie Life.

# The Data Center

## InsurTech by the Numbers

### Quarterly InsurTech funding volume – all stages

(\$ in millions)

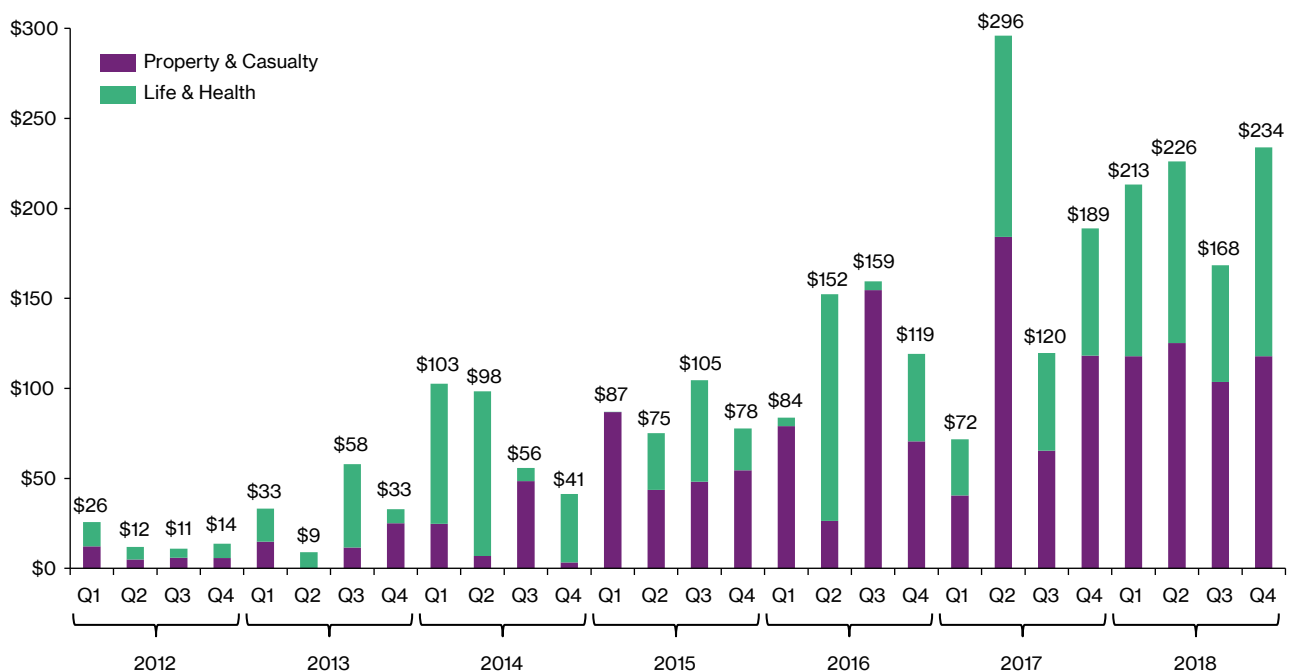


#### Deal Count

P&C:	5	3	4	4	5	4	12	9	10	7	16	8	16	14	16	20	44	18	33	29	23	33	27	42	43	44	40	41
L&H:	8	6	7	9	15	8	9	4	9	15	14	15	10	19	14	20	15	16	6	13	16	32	21	9	23	27	17	22

### Quarterly InsurTech funding volume – early stage

(\$ in millions)



#### Deal Count

P&C:	4	1	4	4	4	2	6	6	5	3	10	6	12	8	9	15	35	9	25	21	15	21	19	24	31	28	22	25
L&H:	6	3	6	6	8	4	5	4	6	8	11	8	4	9	10	16	6	9	3	19	11	19	13	4	13	21	11	14

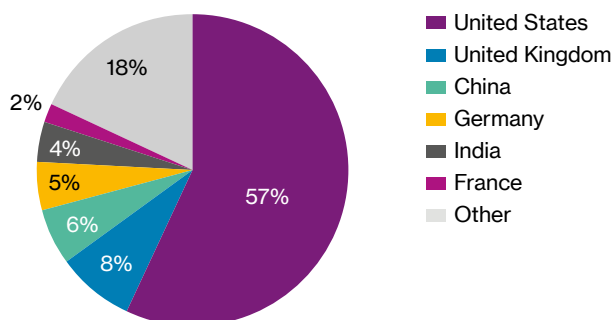


# The Data Center

## InsurTech by the Numbers

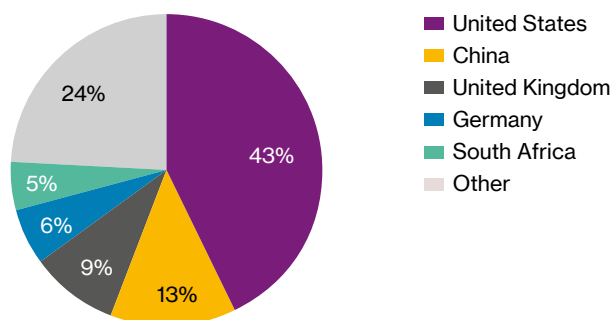
### Quarterly InsurTech transactions by target country

2012 – Q4 2018



2013 – Q4 2018 Transactions: 972

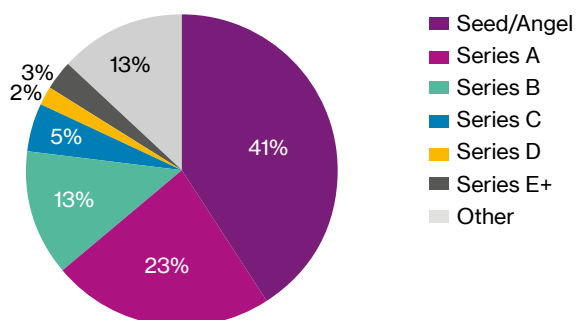
Q4 2018



Q4 2018 Transactions: 63

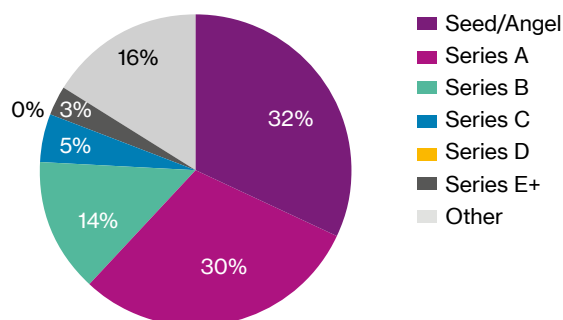
### Quarterly InsurTech transactions by investment stage

2012 – Q4 2018



2013 – Q4 2018 Transactions: 972

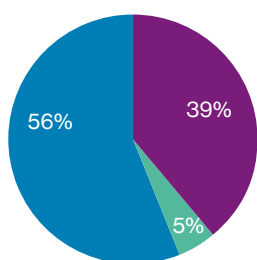
Q4 2018



Q4 2018 Transactions: 63

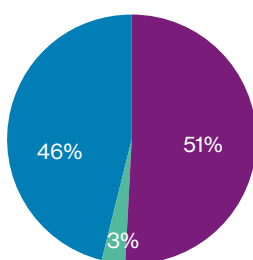
### P&C InsurTech transactions by subsector

2013 – Q4 2018



2012 – Q4 2018 P&C Transactions: 571

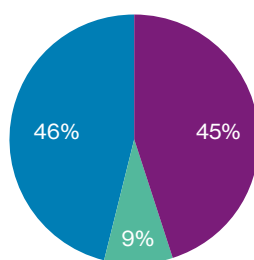
Q4 2018



Q4 2018 P&C Transactions: 41

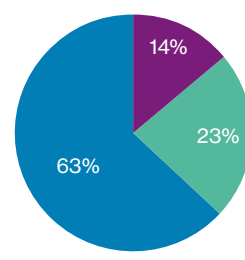
### L&H InsurTech transactions by subsector

2013 – Q4 2018



2012 – Q4 2018 L&H Transactions: 401

Q4 2018



Q4 2018 L&H Transactions: 22

# The Data Center

## Q4 2018 InsurTech Transactions – P&C

Date	Company	Funding (\$mm)		Investor(s)	Description
		Round	Total		
02/10/18	simplesurance	11.5	68.2	<ul style="list-style-type: none"> <li>Allianz X</li> <li>Fines Holding</li> <li>German start-ups Group</li> <li>Groger Management</li> <li>Ilgner.Leeheim.de</li> <li>KfW</li> <li>Mountain Partners</li> <li>ODDO BHF</li> <li>Rakuten Ventures</li> <li>Rheingau Founders</li> <li>Route 66 Ventures</li> <li>Tokio Marine Holdings</li> </ul>	<ul style="list-style-type: none"> <li>simplesurance is an eCommerce provider for product insurances, enabling customers to buy products online and purchase corresponding insurance coverage at the checkout.</li> <li>The company's solutions enable cross-selling of product insurances directly at the point of sale in eCommerce, and integrates into the checkout process of online shops to offer a one-click experience for customers.</li> <li>simplesurance features a plug &amp; play solution for all popular shop-systems, an integrated conversion rate optimizing algorithm, an automated paperless user experience, easy integration via REST API or JS API, and more.</li> </ul>
03/10/18	Digital Fineprint	---	3.1	<ul style="list-style-type: none"> <li>Andy Homer</li> <li>Eos Venture Partners</li> <li>FinTech Innovation Lab</li> <li>Force Over Mass Capital</li> <li>Pentech Ventures</li> <li>Plug and Play Accelerator</li> <li>Shailesh Rao</li> <li>Stephan Apel</li> </ul>	<ul style="list-style-type: none"> <li>Digital Fineprint is an insurance technology company that partners with insurers and brokers, using social media data analytics and digital capabilities to help improve customer targeting, conversion, sales, cross-sell and retention.</li> </ul>
03/10/18	Hedvig	0.63	4.04	<ul style="list-style-type: none"> <li>Cherry Ventures</li> <li>Nicklas Storakers</li> <li>Philian Invest</li> <li>Sophia Bendz</li> <li>Sven Hagstromer</li> <li>Tacito Partners</li> </ul>	<ul style="list-style-type: none"> <li>Hedvig is a Swedish homeowners insurance provider that offers a mobile app aimed at simplifying the way users report damage and receive compensation.</li> </ul>
04/10/18	Authentic4D	5	5	<ul style="list-style-type: none"> <li>IA Capital Group</li> <li>Rev1 Ventures</li> <li>State Auto Labs</li> </ul>	<ul style="list-style-type: none"> <li>Authentic4D is a provider of medical imaging review technology and resolution services for casualty insurance claims.</li> </ul>
04/10/18	Hokodo	2.18	2.18	<ul style="list-style-type: none"> <li>Anthemis Group</li> </ul>	<ul style="list-style-type: none"> <li>Hokodo develops insurance and financing solutions for B2B marketplaces, cloud accounting and e-invoicing platforms, allowing them to offer protection and financing to their customers.</li> </ul>
05/10/18	Utocat	2.19	2.75	<ul style="list-style-type: none"> <li>BNP Paribas</li> <li>BPI France</li> <li>Euratechnologies</li> <li>Fintech Go</li> <li>Leap Ventures</li> <li>Meltropole Europelienne de Lille</li> <li>Paris&amp;Co</li> <li>Undisclosed Angel Investors</li> </ul>	<ul style="list-style-type: none"> <li>Utocat offers a solution for managing the registration and life of unlisted securities by automating the transfer process.</li> </ul>

Note: Blue font denotes current round investors.

# The Data Center

## Q4 2018 InsurTech Transactions – P&C

Date	Company	Funding (\$mm)		Investor(s)	Description
		Round	Total		
10/15/2018	Prima Assicurazioni	115.8	115.8	<ul style="list-style-type: none"> <li>Blackstone Group</li> <li>Goldman Sachs</li> </ul>	<ul style="list-style-type: none"> <li>Prima Assicurazioni is a Milan, Italy-based online insurance company focused on policies for cars, motorcycles and trucks.</li> </ul>
10/16/2018	Applied Systems	---	---	<ul style="list-style-type: none"> <li>Bain Capital</li> <li>CapitalG</li> <li>Hellman &amp; Friedman</li> <li>JMI Equity</li> <li>Vista Equity Partners</li> </ul>	<ul style="list-style-type: none"> <li>Applied Systems is a provider of software that powers the business of insurance. The company specializes in agency management systems and data exchange between agencies, brokers, carriers and their clients.</li> <li>By automating the insurance lifecycle, Applied Systems software enables people around the world to safeguard and protect what matters most.</li> </ul>
10/16/2018	Insurdata	0.8	1.8	<ul style="list-style-type: none"> <li>Anthemis Group</li> <li>Baloise Group</li> <li>Menlo Ventures</li> <li>Plug and Play Ventures</li> <li>Undisclosed Investors</li> </ul>	<ul style="list-style-type: none"> <li>Insurdata is an InsurTech firm that provides re-insurance underwriters with property-specific data to support their pricing, underwriting and portfolio management decisions.</li> <li>Insurdata specializes in high-resolution, peril-specific exposures and building-level risk data, using technology that includes mobile augmented reality and 3-D model creation, providing both desktop and mobile solutions.</li> </ul>
10/16/2018	Jooycar	3	4	<ul style="list-style-type: none"> <li>HCS Capital Partners</li> <li>Undisclosed Investors</li> </ul>	<ul style="list-style-type: none"> <li>Jooycar develops usage based insurance (UBI) and connected car software for Latin America.</li> <li>They combine data collected from devices plugged into the car, as well as a mobile app, to deliver quality rich data about the driver and vehicle. This data includes real time vehicle information, customized maintenance reporting, loss prevention, detailed driver risk assessment and scoring, driving patterns, route optimization etc.</li> </ul>
10/17/2018	Click2Sure	---	---	<ul style="list-style-type: none"> <li>AlphaCode</li> <li>Greenlight Capital Re</li> <li>Team Africa Ventures</li> <li>Undisclosed Angel Investors</li> <li>Webber Wentzel Ignite Incubator</li> </ul>	<ul style="list-style-type: none"> <li>Click2Sure as a digital insurance broker has developed a range of specialized policies across a range of categories.</li> <li>Click2Sure has developed a range of APIs which enable cross-selling of product insurances directly at the point of sale. Its APIs integrate into the checkout process of e-commerce, traditional retail stores, via direct mailers, web/mobile interface and bundled policies attached to high-value items.</li> </ul>
10/17/2018	Young Alfred	1.25	1.82	<ul style="list-style-type: none"> <li>Entrepreneurs Roundtable Accelerator</li> <li>Undisclosed Investors</li> </ul>	<ul style="list-style-type: none"> <li>Young Alfred is an insurance platform that analyzes users' needs, offers custom fit coverage, and allows users to compare and checkout online.</li> </ul>
10/18/2018	Foxquilt	0.92	0.92	<ul style="list-style-type: none"> <li>Extreme Venture Partners</li> </ul>	<ul style="list-style-type: none"> <li>Foxquilt is a Canadian financial technology company focused on using big data and machine learning to empower social groups to save on Home, Small Business and Auto insurance.</li> </ul>
10/23/2018	Roojai	7	7	<ul style="list-style-type: none"> <li>International Finance Corporation</li> </ul>	<ul style="list-style-type: none"> <li>Knowledge Co, dba Roojai, is an online car insurance platform in Thailand.</li> </ul>
10/24/2018	Azur	17.13	17.13	<ul style="list-style-type: none"> <li>American International Group</li> <li>Ascot Group</li> <li>Hyperion Insurance Group</li> <li>Richard Little</li> </ul>	<ul style="list-style-type: none"> <li>Azur is a Managing Digital Agent in partnership with AIG. Azur, which provides products for the high net worth insurance market in the U.K., also builds end-to-end platforms for insurers with the aim of allowing them to operate more effectively with brokers and end customers.</li> </ul>
10/24/2018	Betterview	---	3.68	<ul style="list-style-type: none"> <li>500 Accelerator</li> <li>500 start-ups</li> <li>645 Ventures</li> <li>Alumni Ventures Group</li> <li>Arab Angel Fund</li> <li>Arena Ventures</li> <li>Chestnut Street Ventures</li> <li>Compound</li> <li>Edward Lando</li> <li>Maiden Re</li> <li>MetaProp</li> <li>Nationwide Ventures</li> <li>Pierre Valade</li> <li>Plug and Play Accelerator</li> <li>Plug and Play Ventures</li> <li>Router Ventures</li> <li>Teamworthy Ventures</li> <li>Undisclosed Angel Investors</li> <li>Winklevoss Capital</li> </ul>	<ul style="list-style-type: none"> <li>Betterview provides software and services that capture, organize, and analyze data for buildings and properties to unlock valuable insights. The company uses drones to capture highly detailed imagery, which it then processes and combines with other data sources to make every property thoroughly understood.</li> <li>Betterview offers solutions for the insurance, finance, construction, and real estate industries.</li> </ul>

Note: Blue font denotes current round investors.

# The Data Center

## Q4 2018 InsurTech Transactions – P&C

Date	Company	Funding (\$mm)		Investor(s)	Description
		Round	Total		
10/30/2018	Omni:us	16	22.5	<ul style="list-style-type: none"> <li>7Percent</li> <li><a href="#">Anthemis Group</a></li> <li>Investitionsbank Berlin</li> <li>Michael Schmitt</li> <li><a href="#">MMC Ventures</a></li> <li>Plug and Play Accelerator</li> <li><a href="#">Talis Capital</a></li> <li><a href="#">Target Global</a></li> <li><a href="#">Unbound</a></li> </ul>	<ul style="list-style-type: none"> <li>Omni:us, formerly SearchInk, is a Berlin, Germany-based company focused on insurance that has developed an AI-driven solution which is able to process digital documents by classifying them and extracting the valuable data points.</li> </ul>
11/05/2018	Zeguro	5	5.02	<ul style="list-style-type: none"> <li><a href="#">Healthy Ventures</a></li> <li><a href="#">Mosaik Partners</a></li> <li><a href="#">Munich Re/HSB Ventures</a></li> <li>Plug and Play Accelerator</li> <li><a href="#">Plug and Play Ventures</a></li> <li><a href="#">QBE Ventures</a></li> <li><a href="#">Social Capital</a></li> <li><a href="#">Sparkland Capital</a></li> <li>StartOut</li> <li>Start-upbootcamp InsurTech</li> </ul>	<ul style="list-style-type: none"> <li>Zeguro reduces and insures the threat from cyber security for small and medium enterprises.</li> <li>The company's Cyber Safety Platform acts as a cyber security officer, to identify risks, deliver best practices to reduce exposure, and provide insurance against damage caused by cyber attacks.</li> </ul>
11/06/2018	Duobao Technology	---	---	<ul style="list-style-type: none"> <li><a href="#">Lotus Venture Capital</a></li> <li><a href="#">Plum Ventures</a></li> </ul>	<ul style="list-style-type: none"> <li>Duobao Technology is an insurance sales solutions provider.</li> </ul>
11/14/2018	Hippo	70	109	<ul style="list-style-type: none"> <li>Christopher Hill</li> <li><a href="#">Comcast Ventures</a></li> <li><a href="#">Felicis Ventures</a></li> <li><a href="#">Fifth Wall Ventures</a></li> <li><a href="#">GGV Capital</a></li> <li><a href="#">Horizons Ventures</a></li> <li>Jacob Gibson</li> <li>Josh Stench</li> <li><a href="#">Lennar</a></li> <li>Louis Beryl</li> <li>Mark Lefanowicz</li> <li>Matt Humphrey</li> <li>Pete Flint</li> <li>Pipeline Capital Partners</li> <li>Plug and Play Ventures</li> <li><a href="#">Propel Venture Partners</a></li> <li>Ramtin Naimi</li> <li>RPM Ventures</li> <li>Soo Boon Koh</li> <li>Warren Hogarth</li> </ul>	<ul style="list-style-type: none"> <li>Hippo offers intuitive and proactive home insurance by using data, like municipal building records, and technology, such as satellite imagery and smart home devices, to streamline the quoting and on-boarding experience, for such products as protection for possessions like appliances, consumer electronics and home offices.</li> </ul>
11/21/2018	lotatech	1.28	1.28	<ul style="list-style-type: none"> <li><a href="#">Undisclosed Investors</a></li> </ul>	<ul style="list-style-type: none"> <li>lotatech provides a pay-per-use SaaS insurance platform for risk carriers, third-party administrators and other related businesses, allowing them to stay ahead of the market whilst significantly reducing costs.</li> </ul>
11/26/2018	Corvus Insurance Agency	10	14	<ul style="list-style-type: none"> <li><a href="#">406 Ventures</a></li> <li><a href="#">Bain Capital Ventures</a></li> <li><a href="#">Hudson Structured Capital Management</a></li> </ul>	<ul style="list-style-type: none"> <li>Corvus Insurance Agency is a commercial InsurTech firm that leverages big data, IoT and the latest digital advances in order to put tools and insight into the hands of commercial insurance brokers and clients to help predict and prevent loss.</li> <li>Corvus has created an online platform called the CrowBar. It allows brokers and policyholders on-demand access to policy information, claims reporting, loss prevention recommendations and business intelligence.</li> </ul>
11/27/2018	Clyde	3	3.12	<ul style="list-style-type: none"> <li><a href="#">Expa</a></li> <li><a href="#">Rainfall Ventures</a></li> <li><a href="#">Red Sea Ventures</a></li> <li><a href="#">RRE Ventures</a></li> <li><a href="#">Starting Line</a></li> <li><a href="#">Techstars</a></li> </ul>	<ul style="list-style-type: none"> <li>Clyde has built an API for merchants that allows them to plug into the system and add product guarantee options without having to create the program from scratch.</li> </ul>

Note: [Blue](#) font denotes current round investors.

# The Data Center

## Q4 2018 InsurTech Transactions – P&C

Date	Company	Funding (\$mm)		Investor(s)	Description
		Round	Total		
11/28/2018	Huddle Insurance	13.94	18.42	<ul style="list-style-type: none"> <li>AirTree Ventures</li> <li>Alium Capital</li> <li>Hollard Insurance</li> <li>Richard Enthoven</li> <li>Seven West Media</li> </ul>	<ul style="list-style-type: none"> <li>Huddle Insurance provides insurance products as well as money management tools and aims to create a service, underpinned by a rewards platform, whereby consumers can learn more about managing finances, and will subsequently expand to offer broader peer-to-peer lending options.</li> </ul>
11/28/2018	Turtlemint	6	6	<ul style="list-style-type: none"> <li>Blume Ventures</li> <li>Nexus Venture Partners</li> <li>Sequoia Capital India</li> </ul>	<ul style="list-style-type: none"> <li>Turtlemint is an online insurance seller that offers motorcycle insurance from various providers, allowing users to compare different plans.</li> </ul>
11/29/2018	Chaoji Yuanzhuo	---	---	<ul style="list-style-type: none"> <li>Meridian Capital</li> <li>Zhenxie Investment</li> </ul>	<ul style="list-style-type: none"> <li>Chaoji Yuanzhuo is a CRM tool that provides news, activity analysis, customer analysis, note and other functions for people working in the insurance industry.</li> </ul>
11/29/2018	ELEMENT Insurance	26.2	26.2	<ul style="list-style-type: none"> <li>Alma Mundi Ventures</li> <li>Engel &amp; Volkers Capital</li> <li>FinLeap</li> <li>SBI Investment</li> <li>SBI Life Insurance</li> <li>SIGNAL IDUNA Gruppe</li> </ul>	<ul style="list-style-type: none"> <li>ELEMENT is a B2B2X tech company with a license from the German Federal Financial Supervisory Authority (BaFin). It is a fully digital risk carrier offering private property and casualty insurance that enables a large portfolio of retail protection products through various partners.</li> </ul>
12/04/2018	Indio Technologies	---	8.05	<ul style="list-style-type: none"> <li>500 start-ups</li> <li>8VC</li> <li>Acceleprise</li> <li>Compound</li> <li>Hiscox Holdings</li> <li>Merus Capital</li> <li>New Enterprise Associates</li> <li>NFP Ventures</li> </ul>	<ul style="list-style-type: none"> <li>Indio Technologies is a workflow management platform that brings traditional commercial insurance brokers into the digital age.</li> <li>Indio's platform automates the manual processes of retrieving quotes from different carriers and processing insurance applications from clients. Indio meaningfully reduces the operational overhead required to run a traditional insurance agency, allowing brokers to focus more on sales and relationship management.</li> </ul>
12/04/2018	Naked	2.2	3.6	<ul style="list-style-type: none"> <li>Hollard Insurance</li> <li>Yellowwoods</li> </ul>	<ul style="list-style-type: none"> <li>Naked uses an artificial intelligence based algorithm to bring down the cost of car insurance, by removing the business process such as call centers. The fraud algorithms permit certain claims to be approved instantly, reducing inconvenience and lowering the cost of premiums.</li> </ul>
12/06/2018	Singapore Life	52	122	<ul style="list-style-type: none"> <li>Aflac</li> <li>Chong Sing Holdings</li> <li>FinTech</li> <li>Group</li> <li>IPGL</li> <li>Michael Spencer</li> </ul>	<ul style="list-style-type: none"> <li>Singapore Life is a life insurance company fully licensed by the Monetary Authority of Singapore.</li> <li>Singapore Life offers high net worth universal life solutions for those that prefer Singapore and the Singapore regulatory environment as a destination for their wealth and protection needs.</li> </ul>
12/07/2018	Jooycar	1	4	<ul style="list-style-type: none"> <li>HCS Capital Partners</li> <li>Undisclosed Investors</li> </ul>	<ul style="list-style-type: none"> <li>Jooycar develops usage based insurance (UBI) and connected car software for Latin America.</li> <li>Jooycar combines data collected from devices plugged into the car, as well as a mobile app, to deliver quality rich data about the driver and vehicle. This data includes real time vehicle information, customized maintenance reporting, loss prevention, detailed driver risk assessment and scoring, driving patterns, route optimization etc.</li> </ul>
12/07/2018	Puying Intelligence	2.91	2.91	<ul style="list-style-type: none"> <li>Safe &amp; Rich Venture Capital</li> <li>Taiyue Ventures</li> </ul>	<ul style="list-style-type: none"> <li>Puying Intelligence is an AI insurance claim management service provider.</li> </ul>
12/10/2018	Zesty.ai	13	13	<ul style="list-style-type: none"> <li>Blamar</li> <li>Plug and Play Accelerator</li> <li>Plug and Play Ventures</li> </ul>	<ul style="list-style-type: none"> <li>Zesty.ai is a provider of AI-powered property risk analytics for insurance and real estate.</li> <li>Using computer vision, Zesty.ai extracts building characteristics, such as roof geometry or distance to inflammable vegetation, among other features.</li> </ul>
12/13/2018	REIN	---	7.3	<ul style="list-style-type: none"> <li>Anderson Bell</li> <li>Bert Roberts</li> <li>Christopher Ellis</li> <li>Jason Griswold</li> <li>Kiplin Capital</li> <li>Liberty Mutual Strategic Ventures</li> <li>Plug and Play Ventures</li> <li>Steve Rabbitt</li> </ul>	<ul style="list-style-type: none"> <li>Acenda, dba REIN, is an InsurTech company creating new, custom-made insurance technology products around the emerging risks in mobility, robotics and online ecosystems. REIN uses data, machine learning and modern tools to help companies bring new insurance products to market faster.</li> <li>Founded in 2015, REIN has offices in Chapel Hill, NC, Maynard, MA and Halifax, NS. REIN's wholly-owned subsidiary, Acend Insurance Solutions, LLC, is a licensed surplus lines producer nationwide.</li> </ul>

Note: Blue font denotes current round investors.

# The Data Center

## Q4 2018 InsurTech Transactions – P&C

Date	Company	Funding (\$mm)		Investor(s)	Description
		Round	Total		
12/18/2018	Mylo	28	28	<ul style="list-style-type: none"> <li>Undisclosed Investors</li> </ul>	<ul style="list-style-type: none"> <li>Mylo is a trusted guide to the right insurance for small business and individual needs. With Mylo, users can compare plans tailored to their situation and budget, all in one convenient spot.</li> </ul>
12/19/2018	Albert	12.12	20	<ul style="list-style-type: none"> <li>500 Accelerator</li> <li>500 start-ups</li> <li>American Express Ventures</li> <li>Bessemer Venture Partners</li> <li>CFSI Catalyst Fund</li> <li>Financial Solutions Lab</li> <li>Plug and Play Ventures</li> <li>Portag3 Ventures</li> <li>QED Investors</li> </ul>	<ul style="list-style-type: none"> <li>Albert provides financial advice for free. Albert connects to all user accounts, provides real life recommendations-like repaying credit card debt with a low-interest loan, getting renter's insurance, or setting up the right retirement plan- and lets users take action directly from the app.</li> </ul>
12/19/2018	Cambridge Mobile Telematics	500	502.5	<ul style="list-style-type: none"> <li>SoftBank Group</li> <li>Undisclosed Investors</li> </ul>	<ul style="list-style-type: none"> <li>Cambridge Mobile Telematics provides technology to convert raw sensor data from smartphones, cars, and other mobile devices into accurate inferences about what those devices are doing.</li> <li>Cambridge Mobile Telematics specializes in a number of applications of mobile sensing technologies, including usage-based automotive insurance (UBI), automotive telematics, analysis of smartphone application data (inferring device locations and activities), map augmentation, and analysis of cellular positioning data.</li> </ul>
12/21/2018	SnapSheet	---	49.85	<ul style="list-style-type: none"> <li>Commerce Ventures</li> <li>F-Prime Capital</li> <li>IA Capital Group</li> <li>Intact Ventures</li> <li>Liberty Mutual Strategic Ventures</li> <li>Lightbank</li> <li>Montage Ventures</li> <li>OCA Ventures</li> <li>Plug and Play Accelerator</li> <li>Pritzker Group Venture Capital</li> <li>Rev1 Ventures</li> <li>State Auto Labs</li> <li>Tola Capital</li> <li>Undisclosed Investors</li> <li>USAA</li> </ul>	<ul style="list-style-type: none"> <li>SnapSheet, formerly BodyShopBids, is a self-service mobile application for settling auto insurance claims by photo.</li> <li>Using SnapSheet, insurance carriers can reduce cycle time per claim and lower the cost to receive an estimate. SnapSheet offers a full suite of products to help insurance carriers, adjusters and customers analyze and receive claims efficiently.</li> </ul>
12/21/2018	Waffle Insurance	0.1	0.1	<ul style="list-style-type: none"> <li>Barclays Accelerator</li> <li>Undisclosed Investors</li> </ul>	<ul style="list-style-type: none"> <li>Waffle Insurance is a digital platform that offers holistic insurance protection through one, single, personalized policy covering every aspect of the customer's need.</li> </ul>
12/24/2018	Xiaoxiongbao	---	---	<ul style="list-style-type: none"> <li>Undisclosed Angel Investors</li> </ul>	<ul style="list-style-type: none"> <li>Xiaoxiongbao is an Internet insurance platform offering services such as insurance consulting, claims assistance, policy management, and more.</li> </ul>
12/28/2018	RiskGenius	0.51	8.04	<ul style="list-style-type: none"> <li>Flyover Capital</li> <li>Mid-America Angels</li> <li>Plug and Play Accelerator</li> <li>QBE Ventures</li> <li>Undisclosed Angel Investors</li> <li>Undisclosed Investors</li> </ul>	<ul style="list-style-type: none"> <li>The RiskGenius Platform applies artificial intelligence to insurance policies. Its customers leverage custom algorithms and workflow modules to better understand policy language and create more efficient underwriting workflows.</li> </ul>

Note: Blue font denotes current round investors.



# The Data Center

## Q4 2018 InsurTech Transactions – L&H

Date	Company	Funding (\$mm)		Investor(s)	Description
		Round	Total		
10/11/2018	WU.Kongbao	---	17.32	<ul style="list-style-type: none"> <li>58.com</li> <li>Changba</li> <li>Cyanhill Capital</li> <li>Fengyun Capital</li> <li>Guohua Life</li> <li>Phoenix Rui Capital</li> <li>Plum Ventures</li> </ul>	<ul style="list-style-type: none"> <li>WU.Kongbao focuses on customizing commercial insurance products for the e-commerce industry.</li> </ul>
10/12/2018	Proformex	3.14	4.14	<ul style="list-style-type: none"> <li>Undisclosed Angel Investors</li> <li>Undisclosed Investors</li> </ul>	<ul style="list-style-type: none"> <li>Proformex is a life insurance policy management system that ensures life insurance contracts are actively managed each year.</li> </ul>
10/16/2018	Devoted Health	300	369	<ul style="list-style-type: none"> <li>Andreessen Horowitz</li> <li>F-Prime Capital</li> <li>Premji Invest</li> <li>Uprising</li> <li>Venrock</li> </ul>	<ul style="list-style-type: none"> <li>Devoted Health is a health care company serving seniors, aiming to launch Medicare Advantage plans. The firm's mission is to help users navigate the healthcare system with personal guides.</li> </ul>
10/16/2018	Simply Financial Services	---	3.35	<ul style="list-style-type: none"> <li>Lomhold</li> <li>Yellowwoods</li> </ul>	<ul style="list-style-type: none"> <li>Simply Financial Services is an insurance company offering life, disability, and funeral combos for families, domestic workers, and business employees.</li> <li>By focusing on product design, data analytics, software development, and marketing, Simply aims to materially reduce the cost and complexity of mass-market life insurance.</li> </ul>
10/18/2018	DaShuBao	---	---	<ul style="list-style-type: none"> <li>Kailuosi</li> <li>UNITY VENTURES</li> <li>Zhonglu Capital</li> </ul>	<ul style="list-style-type: none"> <li>DaShuBao is an insurance brand focusing on serving blue-collar workers.</li> </ul>
10/30/2018	Ethos Technologies	35	46.5	<ul style="list-style-type: none"> <li>Accel</li> <li>ARRIVE</li> <li>Downey Ventures</li> <li>Google Ventures</li> <li>Sequoia Capital</li> <li>Silicon Valley Bank</li> <li>Smith Family Circle</li> <li>Stanford University</li> <li>Thirty Five Ventures</li> </ul>	<ul style="list-style-type: none"> <li>Ethos is a life insurance provider that uses the power of technology and predictive analytics to modernize the life insurance process and align products with what families want and need during critical times in their lives.</li> </ul>
11/06/2018	Liangzibao	---	---	<ul style="list-style-type: none"> <li>Alibaba Innovation Center</li> <li>Fosun RZ Capital</li> <li>Infinity Venture Partners</li> <li>Juzhuo Capital</li> <li>Linear Venture</li> <li>PPDai Group</li> <li>Xincheng Investment</li> </ul>	<ul style="list-style-type: none"> <li>Liangzibao is a SaaS-based platform that provides granular insurance solutions for enterprises and individuals.</li> </ul>
11/08/2018	yulife	3.93	3.93	<ul style="list-style-type: none"> <li>Anthemis Group</li> <li>LocalGlobe</li> </ul>	<ul style="list-style-type: none"> <li>yulife is a mobile life insurance company that uses behavioral science and AI.</li> </ul>
11/13/2018	Anorak Technologies	6.48	12.05	<ul style="list-style-type: none"> <li>Kamet</li> <li>Plug and Play Accelerator</li> </ul>	<ul style="list-style-type: none"> <li>Anorak is an online platform that assesses how much life insurance coverage a user needs and scans major insurance companies to find the right policy for the user.</li> </ul>

# The Data Center

## Q4 2018 InsurTech Transactions – L&H

Date	Company	Funding (\$mm)		Investor(s)	Description
		Round	Total		
11/15/2018	Insgeek	14.41	21.61	<ul style="list-style-type: none"> <li>Fosun Kunzhong Capital</li> <li>Legend Holdings</li> <li>National SMEs Development Fund</li> <li>Undisclosed Investors</li> </ul>	<ul style="list-style-type: none"> <li>Insgeek is an online insurance platform focused on SMEs.</li> </ul>
11/20/2018	Nubundle	1.5	1.5	<ul style="list-style-type: none"> <li>Lightbank</li> <li>NFP Ventures</li> <li>Village Global</li> </ul>	<ul style="list-style-type: none"> <li>Nubundle redefines employers' relationships with the family through benefits by providing access to family planning and fertility services.</li> <li>Offers a concierge network of family planning and fertility professionals, fertility services, and just in time insurance – all as a pass-through employee benefit.</li> </ul>
11/27/2018	MioAssicuratore	1.69	2.01	<ul style="list-style-type: none"> <li>H-FARM</li> <li>Innogest Capital</li> <li>Pi Campus</li> <li>Vito Lomele</li> </ul>	<ul style="list-style-type: none"> <li>MioAssicuratore is an online insurance broker which supports clients in selecting contracts from different companies, demystifying their clauses and unique features, and assisting in the purchase and renewal phases.</li> <li>By leveraging algorithms and machine learning tech, the platform calculates the premium in real time considering the unique risk features of any single client.</li> </ul>
11/29/2018	Bright Health	200	440	<ul style="list-style-type: none"> <li>Bessemer Venture Partners</li> <li>Cross Creek Advisors</li> <li>Declaration Partners</li> <li>Flare Capital Partners</li> <li>GE Ventures</li> <li>Greenspring Associates</li> <li>Greycroft Partners</li> <li>Meritech Capital Partners</li> <li>New Enterprise Associates</li> <li>Redpoint Ventures</li> <li>Town Hall Ventures</li> </ul>	<ul style="list-style-type: none"> <li>Bright Health offers affordable, benefit-driven Individual &amp; Family and Medicare Advantage health insurance plans.</li> <li>Through exclusive partnerships with health systems, affordable health insurance plans, and a simple, friendly approach to technology, the company seeks to improve the way people and physicians achieve better health together.</li> </ul>
12/06/2018	Singapore Life	52	122	<ul style="list-style-type: none"> <li>Aflac</li> <li>Chong Sing Holdings FinTech</li> <li>Group</li> <li>IPGL</li> <li>Michael Spencer</li> </ul>	<ul style="list-style-type: none"> <li>Singapore Life is a life insurance company fully licensed by the Monetary Authority of Singapore. Singapore Life offers high net worth universal life solutions for those that prefer Singapore and the Singapore regulatory environment as a destination for their wealth and protection needs.</li> </ul>
12/10/2018	HeavenHR	11.37	18.08	<ul style="list-style-type: none"> <li>Allianz</li> <li>DN Capital</li> <li>Mutschler Ventures</li> <li>Open Ocean Capital</li> <li>Piton Capital</li> <li>Target Global</li> </ul>	<ul style="list-style-type: none"> <li>HeavenHR provides a cloud-based human resources management platform that offer tools to digitize and automate HR administrative tasks as well as to enable money management and HR staff to focus on recruiting, training and engaging employees.</li> <li>Free features include digital contracts, electronic personnel file, absence management, time tracking. Additional services include payroll, benefits, pension and insurance management.</li> </ul>
12/12/2018	BeneFix	---	1.89	<ul style="list-style-type: none"> <li>Ben Franklin Technology Partners of Central &amp; Northern PA</li> <li>MidCap Advisors</li> <li>Undisclosed Investors</li> </ul>	<ul style="list-style-type: none"> <li>BeneFix is a managed marketplace that automates and optimizes marketing, sales, onboarding, enrollment, ben-admin and servicing.</li> </ul>
12/12/2018	Kindur	9	10.25	<ul style="list-style-type: none"> <li>Anthemis Group</li> <li>Clocktower Technology Ventures</li> <li>Point72 Ventures</li> </ul>	<ul style="list-style-type: none"> <li>Kindur offers a platform to support Baby Boomers as they transition into retirement.</li> </ul>
12/17/2018	Nalo	2.3	2.3	<ul style="list-style-type: none"> <li>Eric Ibled</li> <li>Sonia Fendler</li> </ul>	<ul style="list-style-type: none"> <li>Nalo is a personal investment management platform. With Nalo, users subscribe to a life insurance policy into which their investments are made.</li> </ul>

Note: Blue font denotes current round investors.

# The Data Center

## Q4 2018 InsurTech Transactions – L&H

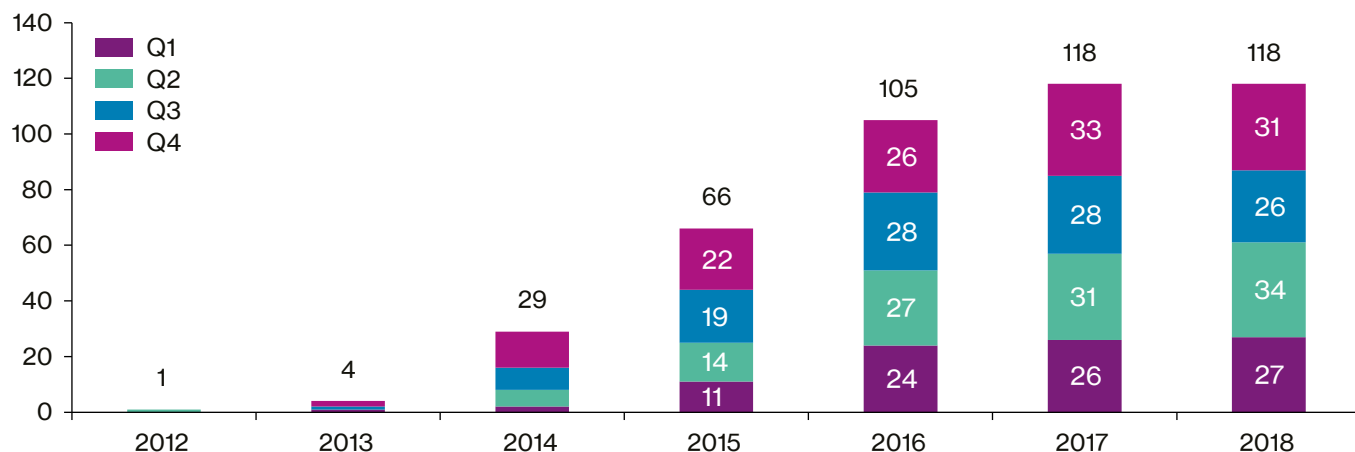
Date	Company	Funding (\$mm)		Investor(s)	Description
		Round	Total		
12/20/2018	Bowtie Life Insurance Company	30	30	<ul style="list-style-type: none"> <li>Hong Kong X</li> <li>Sun Life Financial</li> </ul>	<ul style="list-style-type: none"> <li>Bowtie is a digital insurance company that plans to offer a range of health-focused insurance products.</li> </ul>
12/21/2018	Life by Spot	5.85	5.85	<ul style="list-style-type: none"> <li>Plug and Play Ventures</li> <li>Silverton Partners</li> </ul>	<ul style="list-style-type: none"> <li>Life by Spot offers short-term life insurance for a suite of activities with an immediate policy approval through SPOT's mobile application.</li> </ul>
12/21/2018	Memori	0.1	0.1	<ul style="list-style-type: none"> <li>113 Venture</li> </ul>	<ul style="list-style-type: none"> <li>Memori is an all-in-one online platform to manage legacy, from the convenience of securing wills, insurance policies, and memorial services.</li> </ul>
12/31/2018	Singapore Life	20	122	<ul style="list-style-type: none"> <li>Aflac</li> <li>Chong Sing Holdings FinTech Group</li> <li>IPGL</li> <li>Michael Spencer</li> </ul>	<ul style="list-style-type: none"> <li>Singapore Life is a life insurance company fully licensed by the Monetary Authority of Singapore. Singapore Life offers high net worth universal life solutions for those that prefer Singapore and the Singapore regulatory environment as a destination for their wealth and protection needs.</li> </ul>

Note: Blue font denotes current round investors.

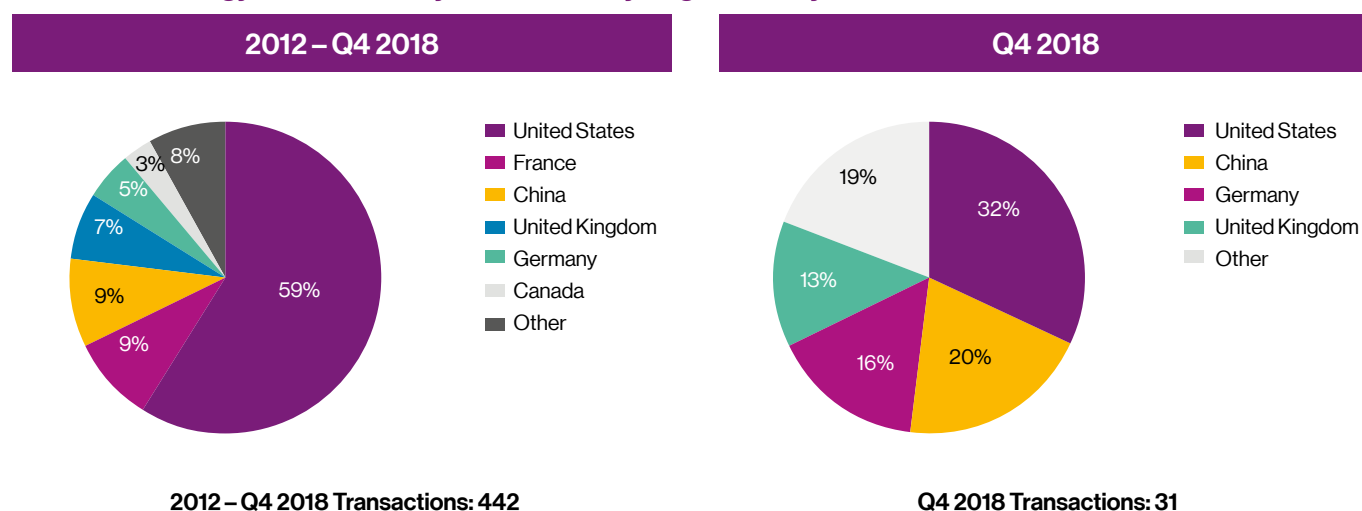
# The Data Center

## InsurTech by the Numbers

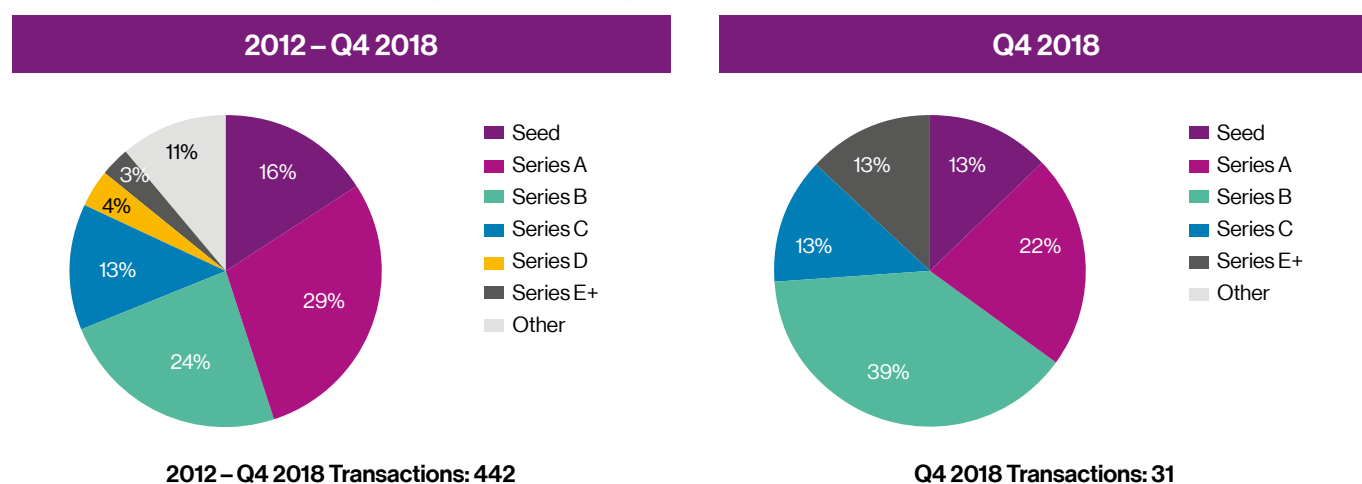
### Private technology investments by (re)insurers



### Private technology investments by (re)insurers by target country



### Private technology investments by (re)insurers by investment stage



# The Data Center

## Q4 2018 Private Technology Investments by (Re)insurers

Date	Company	Funding (\$mm)		(Re)insurer Investor(s)	Description
		Round	Total		
10/02/2018	simplesurance	11.5	68.2	▪ Tokio Marine Holding	<ul style="list-style-type: none"> <li>simplesurance is an eCommerce provider for product insurances, enabling customers to buy products online and purchase corresponding insurance coverage at the checkout.</li> <li>The company's solutions enable cross-selling of product insurances directly at the point of sale in eCommerce, and integrates into the checkout process of online shops to offer a one-click experience for customers. simplesurance features a plug &amp; play solution for all popular shop-systems, an integrated conversion rate optimizing algorithm, an automated paperless user experience, easy integration via REST API or JS API, and more.</li> </ul>
10/09/2018	YourMechanic	10.2	38.27	▪ American Family Ventures	<ul style="list-style-type: none"> <li>YourMechanic, owned and operated by Service Marketplace, is a web and mobile marketplace for vehicle owners to find local mechanics for car repair services.</li> </ul>
10/17/2018	Click2Sure	---	---	▪ Greenlight Capital Re	<ul style="list-style-type: none"> <li>Click2Sure as a digital insurance broker has developed a range of specialized policies across a range of categories.</li> <li>Click2Sure has developed a range of APIs which enable cross-selling of product insurances directly at the point of sale. Its APIs integrate into the checkout process of e-commerce, traditional retail stores, via direct mailers, web/mobile interface and bundled policies attached to high-value items.</li> </ul>
10/19/2018	Rise People	11.44	11.44	▪ Sun Life Financial	<ul style="list-style-type: none"> <li>Rise People, formerly PaySavvy, is a national human capital management software provider that offers cloud-based payroll, human resource, and time and labor management software.</li> </ul>
10/23/2018	K4Connect	12	21.9	<ul style="list-style-type: none"> <li>▪ AXA Venture Partners</li> <li>▪ RGAX</li> </ul>	<ul style="list-style-type: none"> <li>K4Connect is a technology integration company focusing on smart home and on-demand apps for senior-living facilities. Its software platform can integrate any number of disparate smart devices, systems and applications into a single responsive system.</li> </ul>
10/23/2018	Lenovo Intelligent Healthcare	---	---	▪ Ping An Insurance	<ul style="list-style-type: none"> <li>Lenovo Intelligent Healthcare is a subsidiary of Lenovo Ventures Group.</li> <li>It provides process re-engineering consulting, smart comprehensive hospital information system, smart chain hospital information system, hospital big data service, hospital infrastructure cloud solution, mobile medical solution, smart health and smart health for hospital customers.</li> </ul>
10/24/2018	Azur	1713	1713	<ul style="list-style-type: none"> <li>▪ American International Group</li> <li>▪ Ascot Group</li> <li>▪ Hyperion Insurance Group</li> </ul>	<ul style="list-style-type: none"> <li>Azur is a Managing Digital Agent in partnership with AIG.</li> <li>Azur, which provides products for the high net worth insurance market in the U.K., also builds end-to-end platforms for insurers with the aim of allowing them to operate more effectively with brokers and end customers.</li> </ul>
10/24/2018	Xgene Pharmaceutical	20	20	▪ Ping An Insurance	<ul style="list-style-type: none"> <li>Xgene Pharmaceutical is a drug developer that is dedicated to the treatment and development of small-molecule drugs for chronic pain, infectious diseases and tumors.</li> </ul>
10/25/2018	Hackajob	6.4	7	▪ AXA Venture Partners	<ul style="list-style-type: none"> <li>Hackajob is a data-driven recruitment platform that matches people with jobs relevant to their skillsets and expectations then challenges people to 'hack' them.</li> </ul>
10/29/2018	Pivot	25	30.8	▪ Nationwide Ventures	<ul style="list-style-type: none"> <li>A program that combines wearable tech, clinical expertise, personal coaching, and behavioral science to help people quit smoking.</li> <li>There are four main components designed to engage, raise awareness, and help users achieve long-lasting change.</li> </ul>
11/05/2018	Zeguro	5	5.02	<ul style="list-style-type: none"> <li>▪ Munich Re/HSB Ventures</li> <li>▪ QBE Ventures</li> </ul>	<ul style="list-style-type: none"> <li>Zeguro reduces and insures the threat from cyber security for small and medium enterprises.</li> <li>The company's Cyber Safety Platform acts as a cyber security officer, to identify risks, deliver best practices to reduce exposure, and provide insurance against damage caused by cyber attacks.</li> </ul>
11/07/2018	Ticker	---	---	▪ Munich Re/HSB Ventures	<ul style="list-style-type: none"> <li>Ticker is a telematics insurance provider.</li> </ul>

# The Data Center

## Q4 2018 Private Technology Investments by (Re)insurers

Date	Company	Funding (\$mm)		(Re)insurer Investor(s)	Description
		Round	Total		
11/07/2018	Fraugster	14	19	<ul style="list-style-type: none"> <li>Munich Re/HSB Ventures</li> </ul>	<ul style="list-style-type: none"> <li>Fraugster is a German-Israeli anti-fraud company with the goal of eliminating fraud and increasing its customers' profits.</li> <li>Fraugster invented an artificial intelligence technology that combines human-like accuracy with machine scalability. This ability lets Fraugster foresee fraudulent transactions before they actually happen and creates a competitive advantage over other players in the anti-fraud space.</li> </ul>
11/08/2018	Birdie	7.99	7.99	<ul style="list-style-type: none"> <li>AXA Venture Partners</li> </ul>	<ul style="list-style-type: none"> <li>Birdie is building a holistic home care platform to foster independent living of the elderly. Through apps and home connected devices, the system allows older adults to live at home healthier and independent while helping the care community to deliver tailored care.</li> </ul>
11/13/2018	NextCure	93	185	<ul style="list-style-type: none"> <li>Ping An Insurance</li> </ul>	<ul style="list-style-type: none"> <li>NextCure is a biopharmaceutical company focused on discovering and developing immuno-oncology-based drugs.</li> <li>The Company is applying its platforms and know-how to identify biologically relevant targets and develop improved immunotherapy products.</li> </ul>
11/13/2018	Ridecell	31.39	71.7	<ul style="list-style-type: none"> <li>BNP Paribas</li> <li>Munich Re/HSB Ventures</li> </ul>	<ul style="list-style-type: none"> <li>Ridecell is on a mission to empower auto OEMs, new mobility providers and private fleets to launch and manage their own ridesharing and carsharing services.</li> <li>The company provides an intelligent software platform that runs new mobility services, such as carsharing, ridesharing and autonomous fleet management. End-to-end integration and automation accelerate time to market, enabling Ridecell customers to launch mobility services quickly, operate efficiently, and scale revenues as business grows.</li> </ul>
11/15/2018	Xiaobangtouzi	---	---	<ul style="list-style-type: none"> <li>Reinsurance Group of America</li> </ul>	<ul style="list-style-type: none"> <li>Xiaobangtouzi is a wealth management consulting service provider for families, whose offerings include insurance planning and investment management.</li> </ul>
11/19/2018	Xiaoqule	108	108	<ul style="list-style-type: none"> <li>Ping An Insurance</li> </ul>	<ul style="list-style-type: none"> <li>Xiaoqule is a neighborhood social e-commerce platform.</li> </ul>
11/19/2018	FinLeap	47.56	116	<ul style="list-style-type: none"> <li>Ping An Ventures</li> </ul>	<ul style="list-style-type: none"> <li>FinLeap is a Berlin-based company builder that supports entrepreneurs who are building scalable businesses and solving real problems in the financial industry, supporting them with strong infrastructure and guiding.</li> </ul>
11/20/2018	Zenjob	17.11	26.23	<ul style="list-style-type: none"> <li>AXA Venture Partners</li> </ul>	<ul style="list-style-type: none"> <li>Zenjob is a mobile tech company that solves short-term staffing emergencies by providing hourly workers on-demand.</li> <li>The company hires the workers, who earn more than minimum wage through Zenjob, and lends them out to businesses, who have less admin hassle and more flexibility than with traditional temp agencies.</li> </ul>
11/26/2018	Shanghai Cell Therapy Group	134.2	183.6	<ul style="list-style-type: none"> <li>China Pacific Insurance</li> </ul>	<ul style="list-style-type: none"> <li>Shanghai Cell Therapy Group is an immunotherapy firm that provides biotech healthcare services including cell therapy, cell cryopreservation, genetic testing, cell-related products, health advice and clinical medical big data.</li> </ul>
11/28/2018	CyberGRX	30	59	<ul style="list-style-type: none"> <li>Aetna Ventures</li> <li>MassMutual Ventures</li> </ul>	<ul style="list-style-type: none"> <li>CyberGRX provides a comprehensive third-party risk management platform to cost-effectively identify, assess, mitigate and monitor an enterprise's risk exposure across its entire partner ecosystem.</li> <li>Through automation and advanced analytics, the CyberGRX solution enables enterprises to collaboratively mitigate threats presented from their increasing interdependency on vendors, partners and customers.</li> </ul>
11/28/2018	Nanyan Information	15	15	<ul style="list-style-type: none"> <li>Starr Companies</li> </ul>	<ul style="list-style-type: none"> <li>Nanyan Information is a Shanghai-based online insurance service company that operates a platform that offers cloud architecture, cloud storage, and cloud computing solutions for insurance companies.</li> </ul>



# The Data Center

## Q4 2018 Private Technology Investments by (Re)insurers

Date	Company	Funding (\$mm)		(Re)insurer Investor(s)	Description
		Round	Total		
11/29/2018	Happytal	26.2	29.62	▪ AXA Ventures Partners	<ul style="list-style-type: none"> <li>▪ Happytal specializes in improving the daily lives of patients in healthcare facilities.</li> <li>▪ Happytal has deployed a concierge that offers a multitude of services and products to improve their daily lives. Patients can benefit from massage treatments, delivered newspapers or chocolates, hair treatments or provide childcare during the hospitalization, among other services.</li> </ul>
12/10/2018	HeavenHR	11.37	18.08	▪ Allianz	<ul style="list-style-type: none"> <li>▪ HeavenHR provides a cloud-based human resources management platform that offer tools to digitize and automate HR administrative tasks as well as to enable money management and HR staff to focus on recruiting, training and engaging employees.</li> <li>▪ Free features include digital contracts, electronic personnel file, absence management, time tracking. Additional services include payroll, benefits, pension and insurance management.</li> </ul>
12/17/2018	Protecht	8	15.65	▪ American Family Ventures	<ul style="list-style-type: none"> <li>▪ Protecht is an InsurTech company that offers products across the live events space to create a constant brand offering peace of mind for attendees and their experiences.</li> </ul>
12/19/2018	Alinea Engage	0.86	0.86	▪ Northwestern Mutual Capital	<ul style="list-style-type: none"> <li>▪ Alinea Engage has developed an extensible web-based client intake, engagement and relationship management platform designed to strengthen and extend the continuum of care between healthcare providers and clients in multiple ambulatory care markets.</li> </ul>
12/20/2018	Bowtie Life Insurance Company	30	30	▪ Sun Life Financial	<ul style="list-style-type: none"> <li>▪ Bowtie is a digital insurance company that plans to offer a range of health-focused insurance products.</li> </ul>
12/20/2018	Fair.com	385	1451	▪ Munich Re/ HSB Ventures	<ul style="list-style-type: none"> <li>▪ Fair.com is an auto lending start-up that provides users with a personalized monthly payment range based on their finances, then shows all cars within the user's budget. A user can drive the car for as long as they want, and can trade up, try a new vehicle, or walk away at any time.</li> </ul>
12/31/2018	Singapore Life	20	122	▪ Aflac	<ul style="list-style-type: none"> <li>▪ Singapore Life is a life insurance company fully licensed by the Monetary Authority of Singapore.</li> <li>▪ Singapore Life offers high net worth universal life solutions for those that prefer Singapore and the Singapore regulatory environment as a destination for their wealth and protection needs.</li> </ul>

# The Data Center

## Q4 2018 Strategic (Re)insurer Partnerships

Date	Company	(Re)insurer Partner(s)	Description
10/01/2018	Life By Spot	<ul style="list-style-type: none"> <li>Hannover Re</li> </ul>	<ul style="list-style-type: none"> <li>Hannover Re has partnered with Life By Spot to launch short-duration, event-based life insurance policies, which range from 24-hours to 30-days. Policies will be sold through Life By Spot platform and it is set to launch in 2019.</li> <li>Life by Spot offers short-term life insurance for a suite of activities with an immediate policy approval through SPOT's mobile application.</li> </ul>
10/03/2018	Parsyl	<ul style="list-style-type: none"> <li>AXA XL</li> </ul>	<ul style="list-style-type: none"> <li>AXA XL has formed a partnership with Parsyl, a supply chain data platform which offers enhanced marine risk prevention insights.</li> <li>Parsyl, who were on the first cohort of the Lloyd's Lab, is a supply chain data platform that combines low cost sensing hardware and large scale data mining to deliver insights.</li> </ul>
10/04/2018	Kittyhawk	<ul style="list-style-type: none"> <li>Travelers</li> </ul>	<ul style="list-style-type: none"> <li>Travelers has partnered with Kittyhawk to leverage their drone software to drone pilots employed as claims professionals.</li> <li>Kittyhawk's product will provide Travelers with streaming data, hardware, and software, and help to manage the data flow. This will enable Travelers to better respond to disasters and leverage new technologies safely.</li> </ul>
10/08/2018	simplesurance	<ul style="list-style-type: none"> <li>Tokio Marine</li> </ul>	<ul style="list-style-type: none"> <li>Tokio Marine has formed a strategic partnership with simplesurance which will give them access to simplesurance's technology and platform. This will provide their customers with more efficient means of purchasing insurance.</li> <li>simplesurance is an eCommerce provider for product insurances, enabling customers to buy products online and purchase corresponding insurance coverage at the checkout.</li> </ul>
10/09/2018	Flipkart	<ul style="list-style-type: none"> <li>Bajaj Allianz</li> </ul>	<ul style="list-style-type: none"> <li>Bajaj Allianz has partnered with Flipkart, the Walmart-backed e-commerce marketplace, to offer smartphone protection for customers purchasing devices through their system.</li> <li>This is being positioned as an initial step for Flipkart into insurance, with plans to move into life and general insurance in the future.</li> </ul>
10/10/2018	Amazon	<ul style="list-style-type: none"> <li>Mapfre</li> </ul>	<ul style="list-style-type: none"> <li>Mapfre has entered a strategic partnership with Amazon Spain to offer their products via a branded storefront. They are first insurer in Spain to offer their products through Amazon.</li> <li>This is pitched as a long-term strategic plan which will extend across geographies.</li> </ul>
10/10/2018	Amazon	<ul style="list-style-type: none"> <li>Travelers</li> </ul>	<ul style="list-style-type: none"> <li>Travelers have launched a partnership with Amazon to sell discounted smart home kits, home insurance, and risk management information via a branded storefront.</li> </ul>
10/19/2018	Rise People	<ul style="list-style-type: none"> <li>Sun Life</li> </ul>	<ul style="list-style-type: none"> <li>Sun Life have formed a strategic partnership with Rise People, a HR, payroll, and benefits administration solution tool.</li> <li>The integrated solution, which will offer consumers a single health and wellness platform, will be rolled out to small to mid-sized employers across Canada in early 2019.</li> </ul>
10/23/2018	Azur	<ul style="list-style-type: none"> <li>AIG</li> </ul>	<ul style="list-style-type: none"> <li>AIG have partnered with Azur to launch an insurance product for the high-net worth market of the U.K.</li> <li>Azur are also building end-to-end platforms for insurers with the aim of allowing them to operate more effectively with brokers and end customers.</li> </ul>
10/23/2018	Emil	<ul style="list-style-type: none"> <li>Gen Re, Gothaer Allgemeine Versicherung</li> </ul>	<ul style="list-style-type: none"> <li>Gen Re and Emil have collaborated to launch a pay-per-mile car insurance product to the German market.</li> <li>The IoT product tracks miles in real-time and provides customers with real-time vehicle location tracking, remote diagnostics, and trip overview.</li> </ul>
10/30/2018	Slice Labs	<ul style="list-style-type: none"> <li>AXA XL</li> </ul>	<ul style="list-style-type: none"> <li>AXA XL and Slice Labs, an insurance cloud provider, have launched a cyberinsurance product for SMBs.</li> <li>Slice Labs have developed on-demand, pay-per-use insurance products, powered by machine learning and big data technologies.</li> </ul>
11/02/2018	HSB	<ul style="list-style-type: none"> <li>Chubb</li> </ul>	<ul style="list-style-type: none"> <li>Chubb have formed a partnership with Hartford Steam Boiler, a unit of Munich Re to offer IoT devices to their policyholders. These sensors will monitor for water leakage, and changes in key metrics in the house, including temperature, humidity, and water pressure.</li> </ul>

# The Data Center

## Q4 2018 Strategic (Re)insurer Partnerships

Date	Company	(Re)insurer Partner(s)	Description
11/06/2018	Lydia	▪ CNP Assurances	<ul style="list-style-type: none"> <li>Lydia, a popular peer-to-peer payment app from Europe, is partnering with CNP Assurances to offer mobile phone insurance through their payment app.</li> <li>CNP Assurances participated in their recent Series C funding round.</li> </ul>
11/06/2018	Dashlane	▪ Chubb	<ul style="list-style-type: none"> <li>Chubb have expanded their partnership with Dashlane to provide cyber service to customers in Europe, as well as North America.</li> <li>Dashlane provides a password manager and secure digital wallet app to allow users to manage passwords, credit cards, IDs, and other important information via advanced encryption and local storage.</li> </ul>
11/07/2018	Zeguro	▪ QBE	<ul style="list-style-type: none"> <li>QBE have partnered with Zeguro, a cyber safety platform, to launch an insurance product in North America for SMEs.</li> <li>Zeguro's platform acts as a cyber security officer, to identify risks, deliver best practices to reduce exposure, and provide insurance against damage caused by cyber attacks.</li> </ul>
11/07/2018	Fraugster	▪ Munich Re	<ul style="list-style-type: none"> <li>Munich Re has partnered with Fraugster, an AI-based fraud detection product where Munich Re will reinsure Fraugster's Fraud Free product. This product takes on the full liability should they be wrongly deemed as fraudulent using Fraugster's software.</li> <li>Munich Re also participated in their \$14m Series B funding round through their Munich Re/HSB Ventures arm.</li> </ul>
11/07/2018	CyberCube	▪ CNA	<ul style="list-style-type: none"> <li>CNA have partnered with CyberCube to leverage their cyberinsurance risk modeling and analytics platform. CyberCube's Software as a Service platform provides insights on 7 million companies globally and includes modeling on over one thousand single points of technology failure.</li> </ul>
11/08/2018	Ticker	▪ Munich Re	<ul style="list-style-type: none"> <li>Ticker, a telematics insurer to launch in early 2019, has secured the reinsurance backing of Munich Re.</li> <li>Ticker is backed by a £5m seed investment from Munich Re/HSB Ventures</li> </ul>
11/14/2018	Annum Health	▪ Cigna	<ul style="list-style-type: none"> <li>Cigna, a US-based health insurer, has collaborated with Annum Health to offer their customers a digital support solution to help tackle alcoholism and reduce consumption</li> <li>Annum Health provides heavy drinkers with medical and behavioral treatments, personalized coaching and online social support</li> </ul>
11/15/2018	Health IQ	▪ Protective Life	<ul style="list-style-type: none"> <li>Protective Life have partnered with Health IQ to launch a life insurance for product for well-managed diabetics.</li> <li>Health IQ is using proprietary data and insights combined with the latest scientific research, to create insurance plans for active individuals; they are now expanding this to include active people with conditions</li> </ul>
11/16/2018	Triax Technologies	▪ Travelers	<ul style="list-style-type: none"> <li>Travelers have partnered with Triax Technologies to review data collected from Triax's IoT construction technology to explore the potential safety benefits of these wearables.</li> <li>Triax Technologies develops and delivers wearable IoT technology for construction site connectivity.</li> </ul>
11/16/2018	Rapid7	▪ Starr Companies	<ul style="list-style-type: none"> <li>Starr has partnered with security company Rapid7 to offer their customers cyber loss prevention services.</li> <li>Rapid7 offer advanced capabilities for vulnerability management, penetration testing, controls assessment, incident detection and investigation across your assets and users for virtual, mobile, private and public cloud networks.</li> </ul>
11/26/2018	Concirus	▪ TransRe	<ul style="list-style-type: none"> <li>TransRe have partnered with Concirus to develop data-driven reinsurance insights, products, and services</li> <li>Concirus is a London-based provider of marine and motor analytics</li> </ul>
11/26/2018	Flock	▪ The Hartford	<ul style="list-style-type: none"> <li>Flock, a software platform to manage HR, Benefits, and Compliance, has partnered with The Hartford to offer its SMBs and their insurance brokers access to The Hartford's employee benefits plans</li> <li>The Hartford participated in Flock's Series A financing round in 2017</li> </ul>

# The Data Center

## Q4 2018 Strategic (Re)insurer Partnerships

Date	Company	(Re)insurer Partner(s)	Description
11/27/2018	CoverHound	<ul style="list-style-type: none"> <li>Progressive</li> </ul>	<ul style="list-style-type: none"> <li>Progressive has partnered with CyberPolicy, a wholly owned subsidiary of CoverHound, to offer cyberinsurance to SMBs.</li> <li>CyberPolicy will help businesses create a customized cybersecurity plan, compare and purchase cybersecurity software or services, and compare and purchase the best available cybersecurity insurance online.</li> </ul>
11/28/2018	Snapshot	<ul style="list-style-type: none"> <li>Zurich</li> </ul>	<ul style="list-style-type: none"> <li>Zurich has entered a strategic agreement with Snapshot. This will enable Zurich to deploy Snapshot's virtual claims technology in multiple countries. Snapshot is a self-service mobile application for settling auto insurance claims by photo</li> </ul>
11/28/2018	Praedicat	<ul style="list-style-type: none"> <li>AGCS</li> </ul>	<ul style="list-style-type: none"> <li>AGCS, Allianz Global and Specialty, has expanded its partnership with Praedicat to offer their clients Praedicat's ChemMeta software product. This product will provide users access to customized intelligence and analytical insights on chemicals and other materials.</li> <li>Praedicat works with (re) insurers to understand and manage exposure, liability, and better profit from risk opportunities through cutting-edge knowledge engineering and modeling technology.</li> </ul>
12/06/2018	States Title	<ul style="list-style-type: none"> <li>North American Title</li> </ul>	<ul style="list-style-type: none"> <li>States Title are closing a deal to purchase North American Title Group's underwriting arm, North American Title Insurance Company. It will continue to operate under the North American Title brand.</li> <li>States Title uses predictive analytics and technology to create a modern title and escrow platform.</li> </ul>
12/12/2018	Lytx	<ul style="list-style-type: none"> <li>Nationwide</li> </ul>	<ul style="list-style-type: none"> <li>Nationwide have partnered with Lytx and offering their DriveCam safety tools to their long-haul trucking clients.</li> <li>Lytx, formerly DriveCam, harnesses the power of data to change human behavior and help good organizations become even better. The Company's flagship product, Lytx DriveCam, sets the standard for driver safety in the industries they serve, and their RAIR Compliance Services helps DOT-regulated fleets comply with safety regulations, complementing the DriveCam Program.</li> </ul>
12/13/2018	Clara Analytics	<ul style="list-style-type: none"> <li>QBE</li> </ul>	<ul style="list-style-type: none"> <li>QBE expanded their partnership with CLARA analytics across its Australian statutory claims. This includes deploying CLARA litigation, their newest product, which aims to avoid and reduce the cost of litigation</li> <li>CLARA analytics builds easy-to-use, AI/machine-learning based products that can get claims teams in front of their workers' compensation claims.</li> </ul>
12/17/2018	Instanda	<ul style="list-style-type: none"> <li>Hiscox</li> </ul>	<ul style="list-style-type: none"> <li>Hiscox signed a pan-European partnership which opens new distribution and service channels and allows them to expand their commercial and personal lines business.</li> <li>Instanda is a management tool that empowers insurers, brokers and MGAs to build and launch any insurance product within unprecedented timescales, and then distribute and self-manage it online, globally.</li> </ul>

# Quarterly InsurTech Briefing

## Additional Information

The Quarterly InsurTech Briefing is a collaboration between Willis Re and CB Insights. Production is led by the following individuals. For more information, or to discuss the results of this report, please direct inquiries to [InsurTech@willistowerswatson.com](mailto:InsurTech@willistowerswatson.com).

### **Andrew Johnston**

*Global Head of InsurTech and  
Quarterly InsurTech Briefing Editor  
Willis Re*

### **Matthew Wong**

*Senior Research Analyst  
CB Insights*

## WillisRe

Willis Re is one of the world's leading reinsurance advisors. Over our 180-year history, we have developed a deep insight into all aspects of the global insurance industry. In particular, we understand how individual insurance companies develop and drive their own unique strategies to achieve their goals. We offer you comprehensive service backed by stable, well-trained staff to help you reach and exceed your specific targets in the most cost-effective fashion.

We have a deep understanding of risk – and all the ways it affects capital and your organization's financial performance. Our core focus is to provide you with a superior understanding of the risks you face, and then advise you on the best ways to manage extreme outcomes.

## CBINSIGHTS

CB Insights is a Pilot Growth and National Science Foundation backed software as-a-service company that uses data science, machine learning and predictive analytics to help our customers predict what's next –

their next investment, the next market they should attack, the next move of their competitor, their next customer, or the next company they should acquire.

## About Willis Towers Watson

Willis Towers Watson (NASDAQ: WLTW) is a leading global advisory, broking and solutions company that helps clients around the world turn risk into a path for growth. With roots dating to 1828, Willis Towers Watson has 45,000 employees serving more than 140 countries and markets. We design and deliver solutions that manage risk, optimize benefits, cultivate talent, and expand the power of capital to protect and strengthen institutions and individuals. Our unique perspective allows us to see the critical intersections between talent, assets and ideas – the dynamic formula that drives business performance. Together, we unlock potential. Learn more at [willistowerswatson.com](https://willistowerswatson.com).



[willistowerswatson.com/social-media](https://willistowerswatson.com/social-media)

Willis Towers Watson is a trading name of Willis Limited,  
Registered number: 181116 England and Wales. Registered  
address: 51 Lime Street, London EC3M 7DQ. A Lloyd's Broker.  
Authorised and regulated by the Financial Conduct Authority  
for its general insurance mediation activities only

Copyright © 2019 Willis Towers Watson. All rights reserved.  
WTW198504/02/19

[willistowerswatson.com](https://willistowerswatson.com)

**Willis Towers Watson** 