### B3i – Blockchain in Re/Insurance CNSF's XXVII International Seminar

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Swiss Re 103

The Tech & Internet Transformation





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# **Blockchain Introduction**



### Intro – What is BLOCKCHAIN?

- The underlying record keeping invented for use with the digital currency BITCOIN.
- "A blockchain is an electronic ledger of distributed records, transactions, or events that are cryptographically hashed, authenticated, and maintained by a network of participants using group consensus protocol."
- A blockchain is "a distributed database that maintains a continuously growing list of transaction records with various protections against tampering and revision."
- A blockchain is a distributed database that maintains a continuously growing list of ordered records called blocks. Each block contains a timestamp and a link to a previous block. By design, blockchains are inherently resistant to modification of the data — once recorded, the data in a block cannot be altered retroactively. from Wikipedia



### Blockchain in a nut shell

#### What is blockchain?

- Back end database that
   permanently records transactions in a
   replicated shared ledger
- Value exchange network for moving and validating transactions/assets between peers without the assistance of intermediaries
- Transparent, updated in real-time, immediately available and selectively auditable by all relevant stakeholders

#### Implications

- Application of blockchain has multiplicity of effects: Consensus, provenance, immutability, finality and resilience
- **Trust layer over internet** establishes trust, accountability and transparency within market participants
- Enterprise applications using blockchain range from back-office functions to parametric products to new business models
- Well known cross-border, large scale application to-date of blockchain technology is bitcoin

### Why Blockchain?

### - It's Transforming the Financial Industry

- U.S. Payment, Clearing, & Settlement (PCS) system processes \$12 Trillion per DAY, or \$3 quadrillion per year. Much of that takes 3 days.
- Process is in need of massive upgrade. 1 bp of \$3 quadrillion = \$300 billion
- Reasons cited by the US Federal Reserve Paper (2016):
  - Reduced Complexity (especially in multiparty, cross-border transactions)
  - Improved end-to-end processing speed and availability of assets and funds
  - Decreased need for reconciliation across multiple recordkeeping infrastructures
  - Increased transparency and immutability in transaction recordkeeping
  - Improved network resiliency through distributed data management
  - Reduced operational and financial risks.

### From Bitcoin To Blockchain

| Bitcoin: A Peer-to-Peer E | Electronic Ca | sh Systen |
|---------------------------|---------------|-----------|
|---------------------------|---------------|-----------|

Satoshi Nakamoto satoshin@gmx.com www.bitcoin.org

Abstract. A parely peer-to-peer version of electronic cash would allow online payments to be sent directly from one party to another without going through a financial institution. Digital signatures provide part of the solution, but the main benefits are lost if a trasted third party is still required to prevent double-spending We propose a solution to the double-spending problem using a peer-to-peer network. The network timestamps transactions by hashing them into an ongoing chain of hash-based proof-of-work, forming a record that cannot be changed without redoing the proof-of-work. The longest chain not only serves as proof of the sequence of versits winessed, but proof that it came from the largest pool of CPU power. As long as a majority of CPU power is controlled by nodes that are not cooperating to attack the network, they'll generate the longest chain and outpace attackers. The network itself equires minimal structure. Messages are broadcast on a best effort basis, and nodes can leave and rejoin the network will, accepting the longest proof-of-work chain as proof of which happened while they were gone.

#### 1. Introduction

Commerce on the Internet has come to rely almost exclusively on financial institutions serving as trusted third parties to process electronic payments. While the system works well enough for most transactions, it still suffers from the inherent weaknesses of the trust based model. Completely non-reversible transactions are not really possible, since financial institutions cannot avoid mediating disputes. The cost of mediation increases transaction costs, limiting the minimum practical transaction size and cutting off the possibility for small casual transactions, and there is a broader cost in the loss of ability to make non-reversible payments for nonreversible services. With the possibility of reversal, the need for trust spreads. Merchants must be wary of their customers, hassling them for more information than they would otherwise need. A certain percentage of fraud is accepted as unavoidable. These costs and payment uncertainties can be avoided in person by using physical currency, but no mechanism exists to make payments over a communications channel without a trusted party.

What is needed is an electronic payment system based on cryptographic proof instead of trust, allowing any two willing parties to transact directly with each other without the need for a trusted third party. Transactions that are computationally impactical to reverse would protect sellers from fraud, and routine escrow mechanisms could easily be implemented to protect buyers. In this paper, we propose a solution to the double-spending problem using a peer-to-peer distributed timestamp server to generate computational proof of the chronological order of transactions. The system is secure as long as honest nodes collectively control more CPU power than any cooperating group of attacker nodes.

- "Bitcoin"- solved the double spending problem
  - Distributed control
  - Anonymity
  - Smartly self-ruled contracts
  - Instant value transfer
- «Blockchain» *offers multiple applications* e.g. insurance
  - Risk assessment
  - Value transfer
  - Claims management
  - Settlement

- : identity management, peer-to-peer networking
- : commitment, IoU, promise to pay, collateral
- : authentication, fraud prevention, audit trail
- : frictionless, zero latency



# **Business Implications for Insurance**

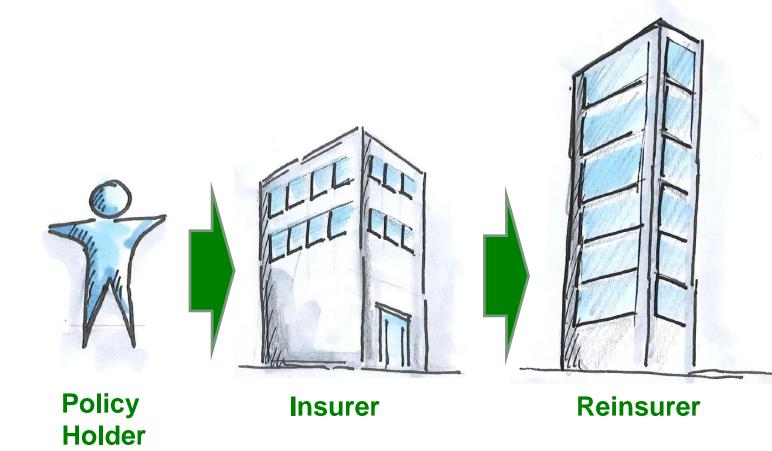


#### A Use-Case for Blockchain in Insurance Auto Liability Subrogation in the USA

- Subrogation for Personal Auto Liability is more than \$10 billion per year
  - Subrogation is reimbursement from 1 insurer to another for a specific accident
- Companies such as Geico, Allstate, USAA, Farmers will owe each other \$100+ million per year
  - Payments are usually made on a claim by claim basis.
  - Auto physical damage losses are typically small (under \$10,000 on average)
  - There are more than 10,000 payments going back and forth between each of these pair of companies
  - Teams at each company keep track of accounts payable and accounts receivable.
- A team at Liberty Mutual proposed an industry solution using blockchain.
  - Data is stored on the blockchain regarding every claim
  - When liability is determined, accounts between pairs of Insurers are updated.
  - Each pair of companies decide how & when to settle their account (by dollar amount, monthly, quarterly, etc)

### **Unlocked** potential

#### Across the Re/insurance Value Chain



## **Efficiency potential**

- Automation and digitisation
- Data standards
- Digital signoffs
- Reduced waiting times
- Reduced reconciliations

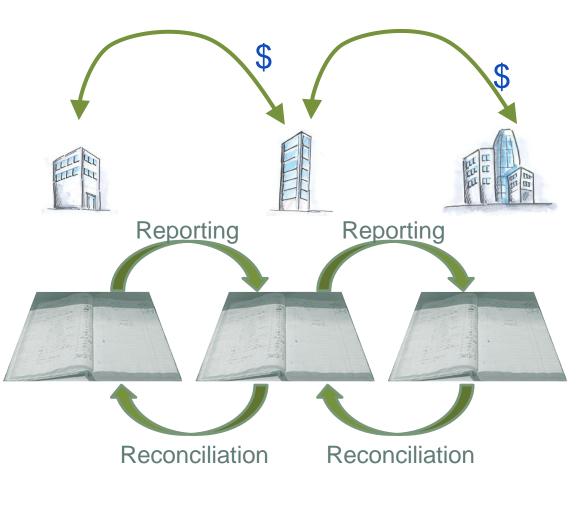
### **Risk reduction**

- Credit risk
- Cash flow inefficiencies
- Operational risk

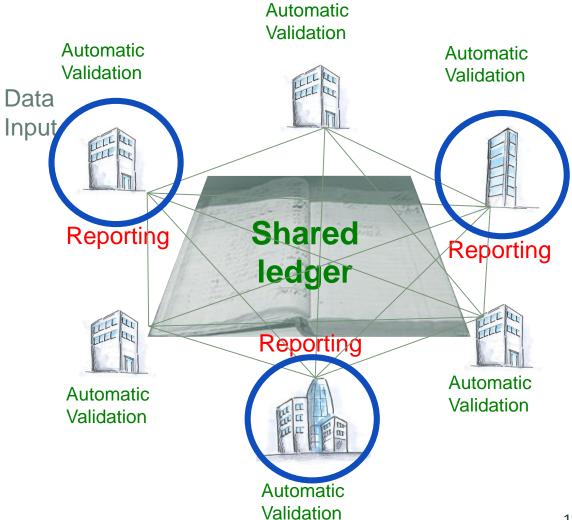
More info: Blockchain explained in layman insurance terms

### How to unlock it

### **Traditional ledger**



### **Shared ledger**



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### Blockchain Insurance Industry Initiative (B3i) A true industry collaboration



www.b3i.tech

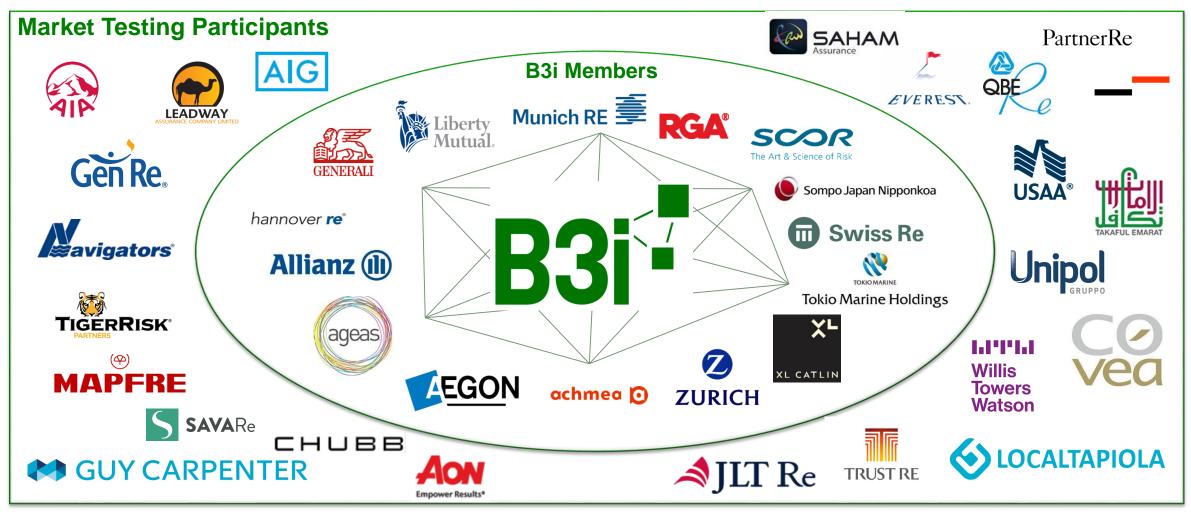
• Vision: manage and trade risks better

- Initiative launch: Swiss Re hosted the foundational meeting in October 2016
- Membership: 15 members at the beginning of 2017, plus 23 new members in October 2017
- Current Focus:
   P&C Property Cat XL prototype
- Outlook:

- Pipeline of use cases including commercial and primary insurance

- Incorporation of permanent organisation <sup>13</sup>

### Rapid Growth Expanded membership jointly undertaking market testing of prototype



### **RiskBlock Alliance (US Blockchain Consortium) Another Insurance Industry Collaboration**



- Sponsored by non-profit entity The Institutes
- More than 30 Insurance, Reinsurance and Risk Management Companies in Group
- Workshop on July 31 & August 1 More than 30 Insurance Leaders participated
- 4 PoCs (Proof of Insurance, Proof of Loss, Parametric Insurance, & Subrogation)
- Example of Blockchain PoC: Subrogation in the USA
  - Current Subrogation process each subrogation claim has payment made
  - Subrogation claims = approx. \$10 billion with millions of claims
  - Blockchain will aggregate balances owed and settle balances between insurers on predefined basis

### Further Insurance Use Cases Under Consideration

| Commercial Insurance   | Coinsurance | Reinsurance<br>(P&C and Life)   | Financial Markets           |  |
|--|-------------|---|-----------------------------|--|
| <ul> <li>Large Commercial Risk<br/>insurance</li> <li>Nuclear Risks &amp; other Pools</li> <li>Multinational Programs</li> <li>Parametric Insurance</li> <li>Marine insurance</li> </ul> | Coinsurance | <ul> <li>Property Non Proportional</li> <li>Auto Non Proportional</li> <li>Casualty Non Proportional</li> <li>Quota share/Surplus all lines</li> <li>L&amp;H Seriatim data</li> </ul> | Insurance-Linked Securities |  |
| Universal  |             |   |                             |  |

Collateralized transaction

- Digital Identity Management (KYC)
- Medical expertise
- Risk Database
- Cat data exchange

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• Net Settlement

# Benefits & Outlook



### Swiss Re expects a range of benefits



Working Capital Improvement

Faster and more efficient premium and claims settlement and optimised liquidity management

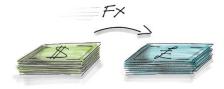


**Operational Efficiency** and **Risk Reduction** 

Reduction of contract uncertainty, reconciliations and process inefficiencies



Data



Foreign Exchange Management

Accelerated FX transactions and consistent valuation

Normalised and highquality data in a shared source with central control over integrity and easier auditing

**Quality and Integrity of** 

Positive Impacts:

- Combined Ratio
- Improved liquidity
- Risk Reduction







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