CRAXEL

Transformational Digital Trust

Unprecedented Security,

Remarkable Performance

Craxel, Inc.

Overview

Personal privacy. Artificial intelligence. Digital transformation. Internet of Things. Secure data is at the heart of these and other trends. Craxel, Inc.'s breakthroughs in zero-knowledge platforms reduce the cost of trust in our new digital world.

Craxel's breakthrough in high performance searchable encryption will revolutionize the way enterprises manage information. We have reimagined how a database can be built. We rewrote many of the 50 year-old assumptions on database theory to deliver unprecedented security, availability, performance, and scale necessary for tomorrow's data challenges. Eventually, data management without high performance searchable encryption will become obsolete as consumers demand the elimination of information vulnerabilities. Since Craxel's data management technology provides the security, performance and scale needed by the most demanding applications, there is simply no excuse to leave information unprotected.

Craxel's technological DNA has been applied to two key products, the Black Forest Database™ and the Black Forest Distributed Ledger™ to create a comprehensive Digital Trust Platform™. The fully featured Black Forest Database™ has been tested at several millions of transactions per second on 33 cloud servers. It utilizes client-side encryption so that the database server, or cloud provider, or hacker trying to steal data from the database, can never see the contents on the data; yet the users can still search that encrypted data quickly. Black Forest Distributed Ledger™ provides the trustless and immutable transactions popularized by modern blockchains. The promise of blockchain can now be realized by solving the two key issues of modern blockchain technology: security and performance. The Black Forest Distributed Ledger™ has been tested at over 300K transactions per second on 33 cloud servers with consensus across distributed nodes, while also ensuring transactions on the chain are always encrypted, yet searchable.

Craxel technology will ultimately power the digital economy by making it safer, easier, and more efficient for every person and enterprise to organize, find, and exchange information or value. Companies will be able to securely store their information in the cloud without fear. Companies will be able to easily and cost-effectively comply with data privacy regulations. People will be able to entrust companies with their information, knowing that it is being stored securely and used properly. Self-sovereign identity will be feasible, allowing every person on the planet to have an identity, leading to the democratization of the digital

Key Innovations

Searchable Encryption

- *Clients only ever have the keys to decrypt their data*

High performance

- *Tested at 8M transactions per second*

Indexing technology

- *Full featured data queries on fully encrypted data*

Distributed consensus

- *Maintain replicas of databases across availability zones with incredible performance and low latency*

Strong consistency

- *A strongly consistent transactional data management system*

Pervasive compartmentalization

- *Multiple layers of encryption and security for multi-tenant operations*

economy. Individuals will be able to seamlessly control the sharing of their identity information. Counterparties will be able to settle their transactions immediately and securely without expensive intermediaries or with intermediaries that provide fair value. Market inefficiencies will be reduced. Payments will be settled in real-time and micropayments will be cost-effective. Companies will be able to trust their supply chains. Citizens will be able to trust their elections.

In this era of incessant cyberattacks and eroding digital trust, secure data must form the foundation for the future digital world. Craxel's technological DNA forms the building blocks of high performance searchable encryption and low-latency, scalable, trustless and immutable transactions to build our digital future.

History

We started in 2007 with the intent to solve the problem of indexing and searching large quantities of multi-dimensional data. This resulted in a probabilistic spatial search method and database architecture that was different from any other. This unique architecture led to breakthroughs in massively parallel consensus and highly efficient replication and synchronization across many database replicas. Then In 2016, we were researching how to create a secure infrastructure for data. The ideal solution would be one where only the data creator or recipient could see the contents, and all other parts of the infrastructure had zero knowledge of the data.
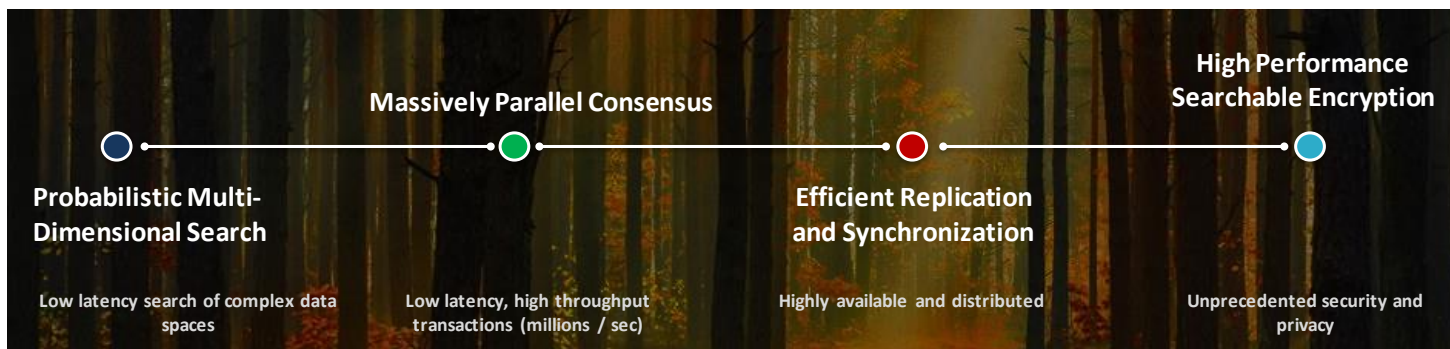

Figure 1 Craxel's Innovations

We discovered that on our unique architecture, we could create a method to encrypt data, with any encryption mechanism, store it at incredible speeds, and still be able to search, and retrieve it with complex queries like range, spatial, partial text match, and other features. This led to the first high performance zero knowledge database. We then extended these concepts to the blockchain space to create the highest performance and secure distributed ledger yet.

Many have searched for solutions to solve the security/performance paradox and the problem of relying on trusted intermediaries for transactions. Until now, the search has been in vain as these technologies have fallen short of what is needed. Fully homomorphic encryption is incredible, but about a trillion times too slow. Modern attempts to implement end-to-end encryption on legacy databases help, yet the query abilities for diverse business cases are too limiting. Information is often also leaked by trying to bolt on security to legacy systems. Security often reduces performance, while performance is often insecure. Craxel's unique architecture is a groundbreaking new approach to secure data management.
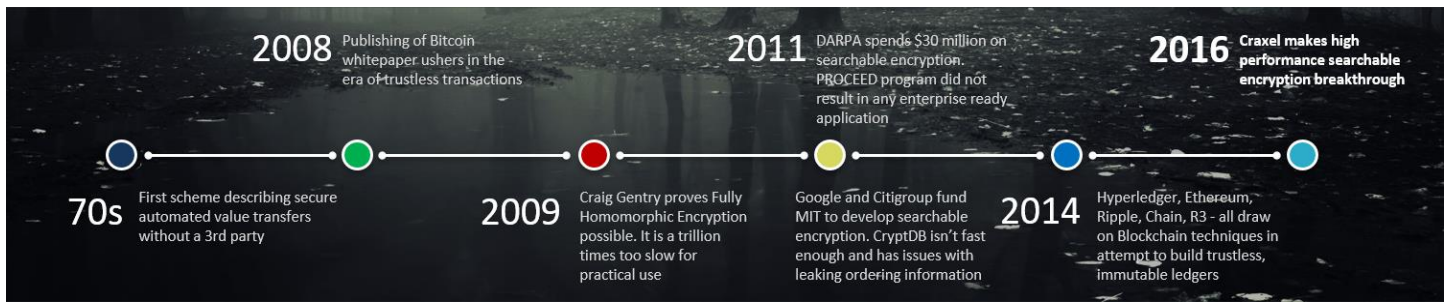
Figure 2 Search for Digital Trust Solutions

Where Craxel Excels

There are many impactful use cases where our transformational technology provides a clear competitive advantage. Craxel's technology is best suited for use cases that either have strict security requirements or have massive data volumes and velocities. Fortunately, these two key requirements form the foundation of the future digital world. Craxel has initially engaged with customers/partners in highly competitive verticals such as payments, financial services, and cloud computing as well as strategic verticals such as healthcare, insurance, and government. In addition, we are applying our proprietary technology to a specific lucrative use case directly through a subsidiary Sylverum, which is described later.

Team

Craxel, Inc. was founded by computer scientists, mathematicians and cyber security experts with significant experience delivering high volume, high velocity systems in highly secure environments.

Dr. Donald Robinson – Founder & CEO

CTO Defense GDIT/CSRA; Program Director Cybersecurity at Caltech; VP Technology, SRA.; Principal Cybersecurity Technologist, Northrop Grumman. PhD Systems Engineering, University of Virginia. MS Statistics, University of Virginia.

David Enga – Founder & CTO

21 years of experience in U.S. Defense industry delivering high volume, high velocity systems in secure environments. Previously Technical Dir., Northrop Grumman and Founder and CEO Internet Energy Systems, Inc. BS Computer Science, Yale University.

Robert Cariddi – Chief Revenue Officer

Experienced Senior VP of Sales with a demonstrated history of working in the software and cybersecurity industry.

Tom Foladare – VP Business Development

Previously Head of North American Channels, RiskIQ; Dir. of Channel Sales, Netskope; Sr. Dir. of BD/Channels, White Hat Security; Dir. of BD/Channels, netForensics; Dir. of BD Digital Fountain

Dr. Chuck Voas – Chief Scientist

Over 30 years of experience building data management solutions in Defense and Aerospace markets. PhD Mathematics, University of Virginia

Greg Webb – EVP Financial Markets

20+ years in Investment industry, 15+ years in financial markets. Exchange and OTC derivatives trading, BD and management with Susquehanna International Group in the US, UK and EU. B.S. in Business Economics, The University of California, Santa Barbara.

Janelle Kellman – EVP Strategy and New Markets

17 years of experience creating business strategies around evolving legal and regulatory systems. Founder multiple startups. J.D. Stanford University, MSc Oxford University, B.A. Yale University.