



INTRODUCTION TO KRIPTAN

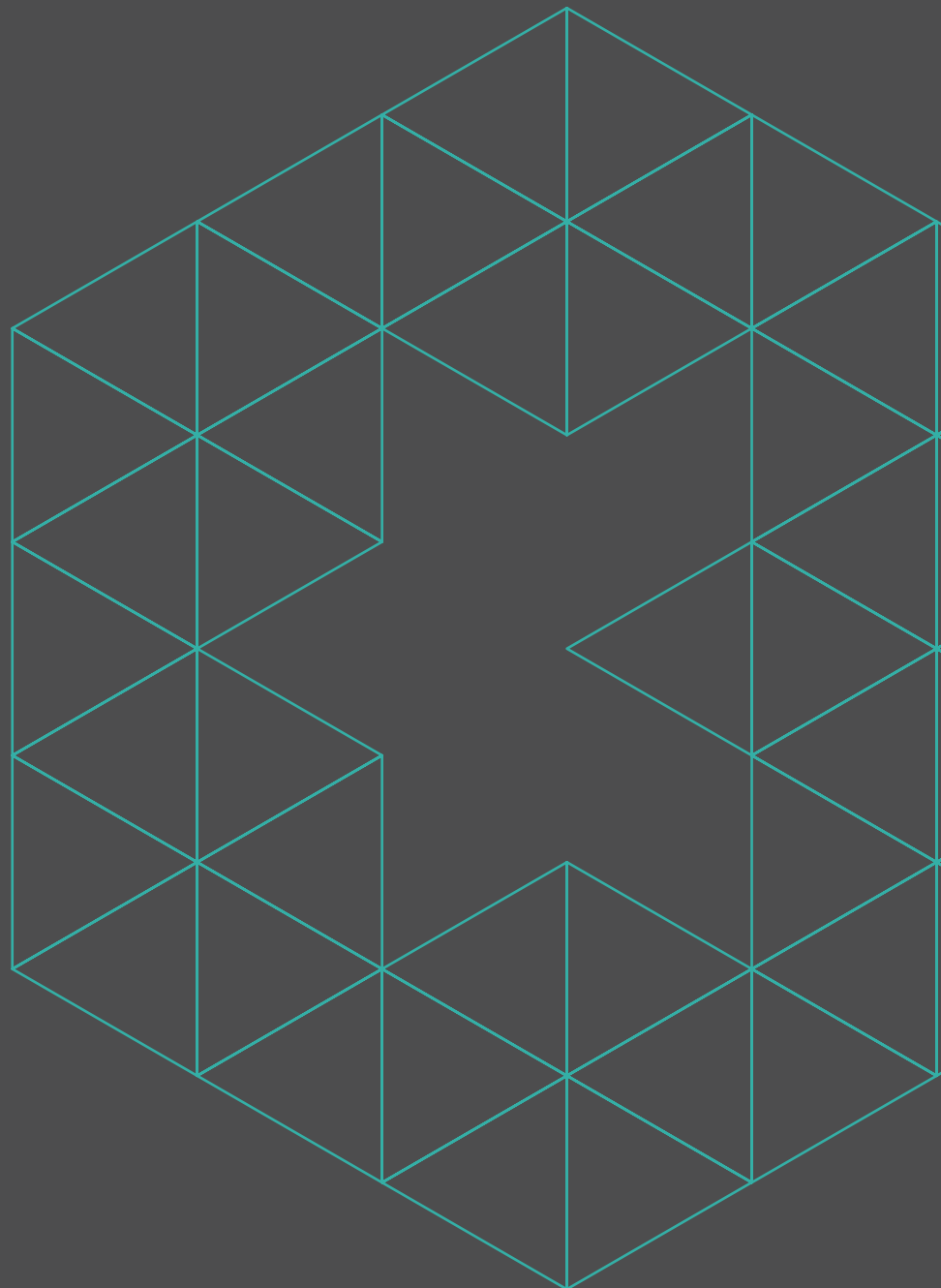
A Global Identity Network

30 January 2019

KRIPTAN

The White Paper Pack contains 3 Companion Documents. For a comprehensive understanding of our vision for the Kriptan Identity Network and how it will become a new privacy preserving Global Identity Network, the reader is advised to read all documents.

WHITE PAPER



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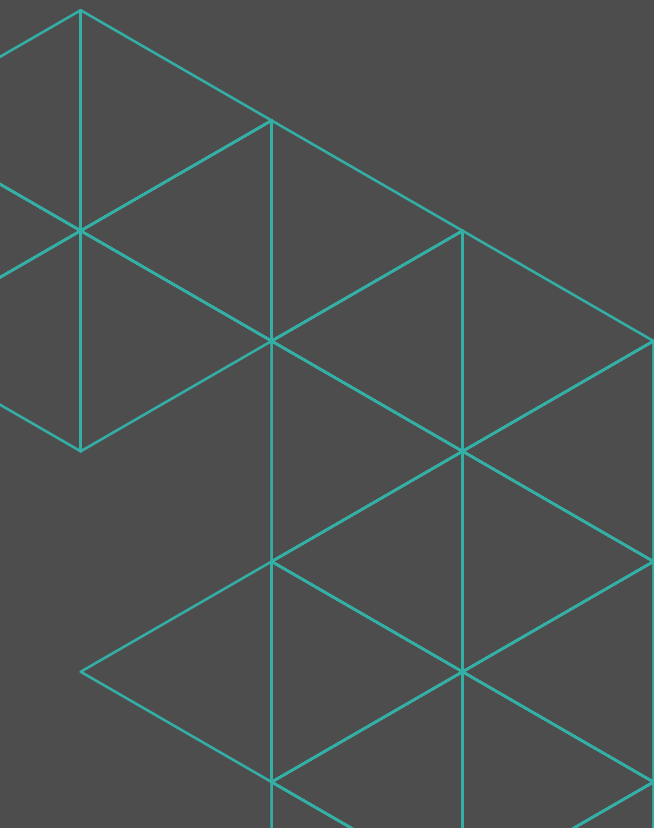
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Introduction

Digital Identity - Why It Matters and Why It Is Important We Get It Right

Digital identities and access systems are foundational elements of our shared digital future. They offer tremendous opportunities for individuals and society. Digital identity is relevant in a wide range of situations that require people and entities to prove who they are.

- World Economic Forum, January 2018

As economies across the world transition to digital societies, the need for a global standard for digital identity is not in doubt. For these globalised, digital economies to enjoy the many opportunities and benefits that frictionless digital services can provide, they need to be fully integrated across borders.

The digital transition also brings significant new personal, commercial and shared risks that could benefit from being managed collaboratively. Paper documents are not fit for purpose in the online world. The false promise of user-created social identities, where an “identity” is just a username and password, is also no longer viable. Massive data breaches have also shown that identities built around large-scale data collection and machine intelligence are also not viable. To mitigate these risks, any global integration project must be centred around a new global standard for robust, high-assurance identity.

The solution must put user privacy at its core, and build public trust through security, reliability and integrity. Identity attributes must be verified by authoritative sources. It is vital that users remain in control of their personal information at all times. Criminals, fraudsters and identity thieves move fast in a digital world, so credentials must be always up to date. In fact, they must be re-verified in real-time at the time of a transaction. Where identities are used in the context of financial services, anonymity is not an option, as the solution must allow for law enforcement access and regulatory oversight. Similar to how the internet is a shared resource, available for everyone to use, a global identity network needs to be available for all to use. It cannot be owned and controlled by a company or a government. It must also be a shared resource, that is governed on behalf of the people who use it.

It is our belief that the Kriptan Network provides the only solution that can meet all these needs and in this document we introduce the key ideas behind the project.



Sedicii

Background to the Kriptan Network

Founded in 2013, Sedicii is the company that pioneered much of the technology behind the Kriptan Network. The company was founded by Rob Leslie, who previously founded Kyckr, which is now listed on the Australian Stock Exchange. Sedicii has received industry recognition as a World Economic Forum Technology Pioneer, along with awards from British Telecom (BT), Ernst & Young (EY), SwiftScale, PricewaterhouseCoopers (PwC) and others. The underlying architecture has been peer tested and audited by independent security experts.



The Sedicii vision is centred around a new, global standard for identity and KYC, that would reduce costs, improve interoperability, reduce crime and ensure privacy. This set of capabilities would facilitate innovations in digital business that haven't been possible before, due to high costs and high business risk.

Roadmap

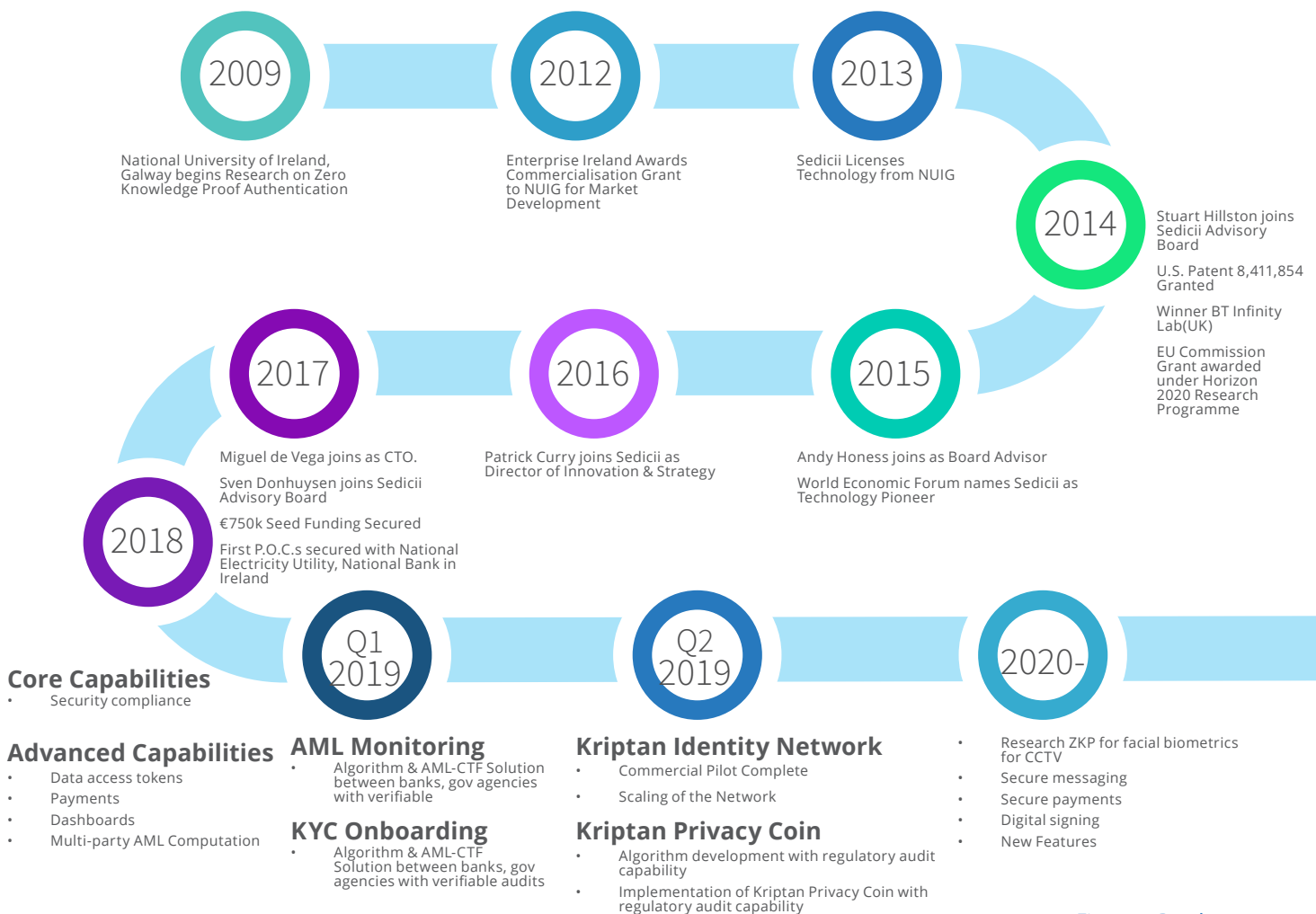


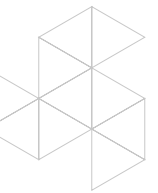
Figure 6: Roadmap



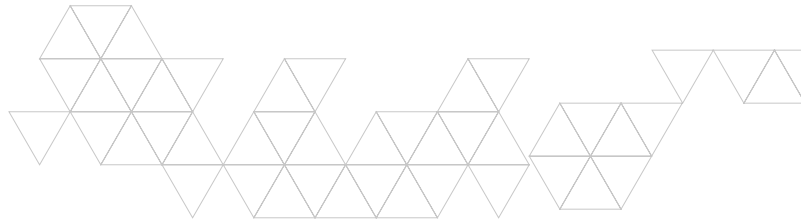
Kriptan

A Network For Everyone

The Kriptan Network is designed to ensure that everyone in society can experience the benefits of a global identity network.



For Business



For too long, businesses have been hampered by fragmented and unreliable digital identity mechanisms, which have placed a limit on growth in the global economy and added to the costs of doing business. Digital relationships need to be based on trust and interoperability. The solutions must be re-usable, scalable, secure, compliant and affordable. The risk of identity fraud makes many new business innovations unviable. By removing the massive cost overhead of fraud detection and remediation, the Kriptan Network will enable new leaner business models.

Banks, telecommunications providers, utilities and airlines will become trusted sources for identity verification, allowing them to generate new revenue streams. The Relying Parties, who will pay for these identity verification services, can also benefit, as they can:

- verify an identity without compromising privacy regulations
- identify fake or synthetic identity, in real-time (passport / utility bill)
- integrate and consume a scalable, fully digital service
- comply with GDPR
- reduce operational costs, especially the cost to verify identities with an authoritative source
- reduce instances of fraud
- avoid compromising competitive advantage as no personally identifiable information is shared
- receive real-time alerts when data changes



For Governments

From the point of view of governments, the Kriptan Network can deliver frictionless economic activity, drive GDP growth and fuel job creation. As we have seen above, reduced costs and frictionless transactions will drive new business services. Governments can support new business activity and new business models by streamlining identity verification.

A nation state that is integrated into the Kriptan Network will be able to verify digitally the data in a passport, driving license, or national ID in real-time, and at scale. This not only significantly reduces the delivery costs of providing government services, it will reduce criminal activity, reduce tax fraud and simplify regulatory oversight.



For Individuals

Without a trusted digital identity, the private information of individuals ends up being replicated across thousands of databases. These databases evolve into large data siloes, where one data breach can release the personal information of billions of people.

The Kriptan Network puts users in charge of their own personal data. At any time, they can grant or revoke access to their data.

The Kriptan Network gives individuals the ability to:

- prove their identity without compromising their privacy
- increase convenience when proving who they are
- declare once, prove many times
- query, manage and update their personal information and who has access to it
- provide and withdraw consent
- receive alerts and notifications when their identity is verified
- have a genuine digital identity built into their mobile device
- prove their age for age-restricted services, without exposing other personally identifiable data
- to receive financial rewards when their identity is verified



An Insight Into Zero Knowledge Proof Technology

“I know something you know. I can prove it without telling you what I know.”

Before we describe the Kriptan Network, we need to introduce a technology called Zero Knowledge Proofs (ZKPs). ZKPs are a form of advanced cryptography that allows two entities (people, organisations, devices) to prove to each other that they have the same data without the need to transmit, replicate or expose that data to the other party. The technology can be applied to a wide range of information, in particular to personal identity data such as passport details, birthdate, gender, nationality and address details.

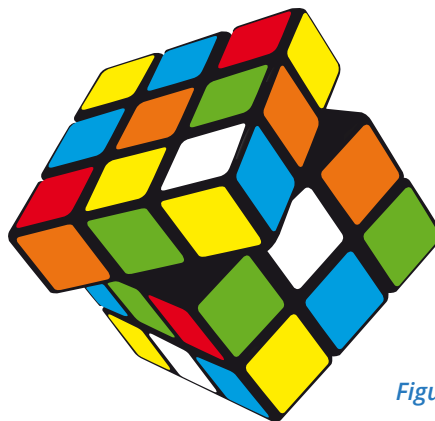
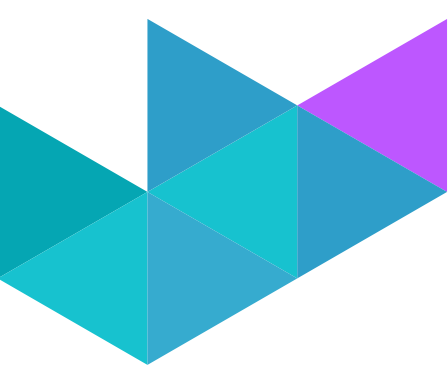


Figure 1: The Rubik's cube analogy

Both sides create codes from the original data, then they interactively check that the other side has the same codes. The analogy we use is the Rubik's cube. You can check if the middle square on the top surface is yellow, the bottom-left square on the right hand surface is white etc. The more checks you do, the more you can be convinced that the other party has the same Rubik's cube configuration as you. In the case of Kriptan ZKPs, the cube is created from the personal information, so both sides will only have the same cube configuration if they both started with the same data.

The key idea here is that the data only needs to sit in two places. An Identity Provider e.g. a government who has issued a driving license, will know your data. The individual will also have their personal data stored securely in their wallet. This allows a third-party, which we call the Relying Party, to verify data about the individual without ever being granted access to the data. This process can be repeated, so that many Relying Parties can know facts about you, without ever being able to access your personal data. A digital service may now confirm that you are over eighteen, an accredited investor under US Securities law and a resident of Maine, all without knowing your date of birth, your bank balance or your address.



The Kriptan Network

As we have seen, the Kriptan Network enables real-time identity updates from trusted identity providers (governments, banks, telcos, utilities), ensuring that businesses can react quickly to new information. At the same time, it is designed to provide the highest possible levels of privacy, where personal data is verified using ZKP technology so that data is never exchanged or copied. The digital asset economy requires a new foundation for public trust. Only public blockchains can engender that trust, by providing a shared, provably-secure ledger. Our ground-breaking ZKP privacy technology underpins this new trust model, by guaranteeing that no personally identifiable information or private business data is ever recorded on the blockchain.

The enforcement of laws and the preservation of basic rights is entrusted to law enforcement agencies and the courts, operating on a mandate from government. Applying the norms of traditional oversight to the blockchain is the key to allowing global adoption of blockchain technologies for governments, businesses and individuals.

We also believe that anonymity is not the way forward. We accept that there are legitimate reasons to allow financial regulators, tax officials and law enforcement agencies to audit the financial ecosystem and that they should have the power to investigate wrongdoing where there is reasonable grounds for suspicion. When this is the case, our platform provides regulators with the capabilities they need to investigate asset transfers with appropriate judicial oversight.



Figure 2: Capabilities of the Kriptan

Kriptan is also more than an identity verification network. The combined capabilities shown in Figure 2 work together to build one compelling feature that truly sets it apart: it allows any business or government to create their own fully-regulated digital asset. The identity network is foundational here: without it, regulated digital assets wouldn't be possible, as the principle of Know Your Customer (KYC) is a core requirement of all regulated financial services. We build on the core identity / KYC capabilities to enable on-chain privacy with off-chain auditability.

The Kriptan Network is governed by a Swiss, non-profit foundation called the Kriptan Foundation. This ensures that the network can reliably provide a shared infrastructure for businesses, governments and individuals, as the foundation will act as a neutral guardian, ensuring the network is governed in the interests of all of its participants. This requires a very specific business model to ensure the long term viability of the foundation. It is, after all, an enormous challenge to build a global identity network. The hardest part of that challenge is at the start, when there are few users and a small number of relying parties (who need to verify identity-related data) and identity providers (who can verify that data). The challenge is to find ways to reward those who embrace the risks involved in being the earliest to join. The Kriptan Token provides that mechanism. The companion document, "White Paper - Kriptan Token Design", includes more details on the incentives provided by the tokens and how we will reward early participants for helping to build the network.

Within the Kriptan Network, the same mechanism we use to ensure the on-chain privacy of all Kriptan Token transactions, can also be used by any third-party digital asset. We ensure that Kriptan Tokens are fully regulated in any jurisdiction and the same approach can also be applied to any digital asset. What is common across all new digital assets is that they will require robust identity capabilities, advanced privacy capabilities, tools for regulatory oversight and public trust. Today, only the Kriptan Network can provide all of these.



The Four Pillars of The Kriptan Network

The Kriptan Network is built on the following four pillars:

Public Trust

As it's currently impossible to verify the identity of a person you are transacting with online, today's approach is to use third-party services to mediate trust on our behalf. This makes much of our economic activity highly inefficient. The Kriptan Network removes these inefficiencies by building a layer of public trust. When users know the real identities of the people that they transact with, the risk of fraud and other criminal activities will be greatly reduced.

Identity and KYC

Robust KYC hinges on verification of identity from authoritative sources. The ability to verify in real-time is necessary, we believe, to eliminate fraud and other forms of criminality. KYC is a very expensive and complex process for any organisation dealing with financial transactions. The Kriptan Network simplifies this process and greatly reduces the costs involved by standardising KYC services. The Kriptan Network adds real-time verification and syncing so that information always remains up to date and is verified when it is used.

Regulatory & Judicial Oversight

Kriptan is designed to be private by default, but where traceability and accountability can be re-introduced when there is probable cause that illegal activity may have taken place. As no one entity on the Kriptan Network controls the full set of information required to trace transactions, this provides an extra level of data protection against both hacking attacks and also any attempts to by-pass due legal process. However, we do provide the capabilities to ensure that once the necessary judicial orders are in place, the data can be recovered by a law enforcement agency. It is important to point out that this lawful access process requires the authorities to request the *specific* data they require from the *multiple* parties that hold it. Only by rebuilding the full set of linked data, from these multiple sources, can they trace the specific transactions authorised by the courts.

Privacy

The Kriptan Network ensures that personal data is never copied or exchanged. By using an advanced form of cryptography called Zero Knowledge Proofs, it allows Identity Providers to confirm information about an individual, without sharing that data with a third party. It is privacy-preserving by default. The user is always in control and can choose to share their data if they so wish.



The Architecture Of The Kriptan Network

Figure 3 below shows the architecture of the network.

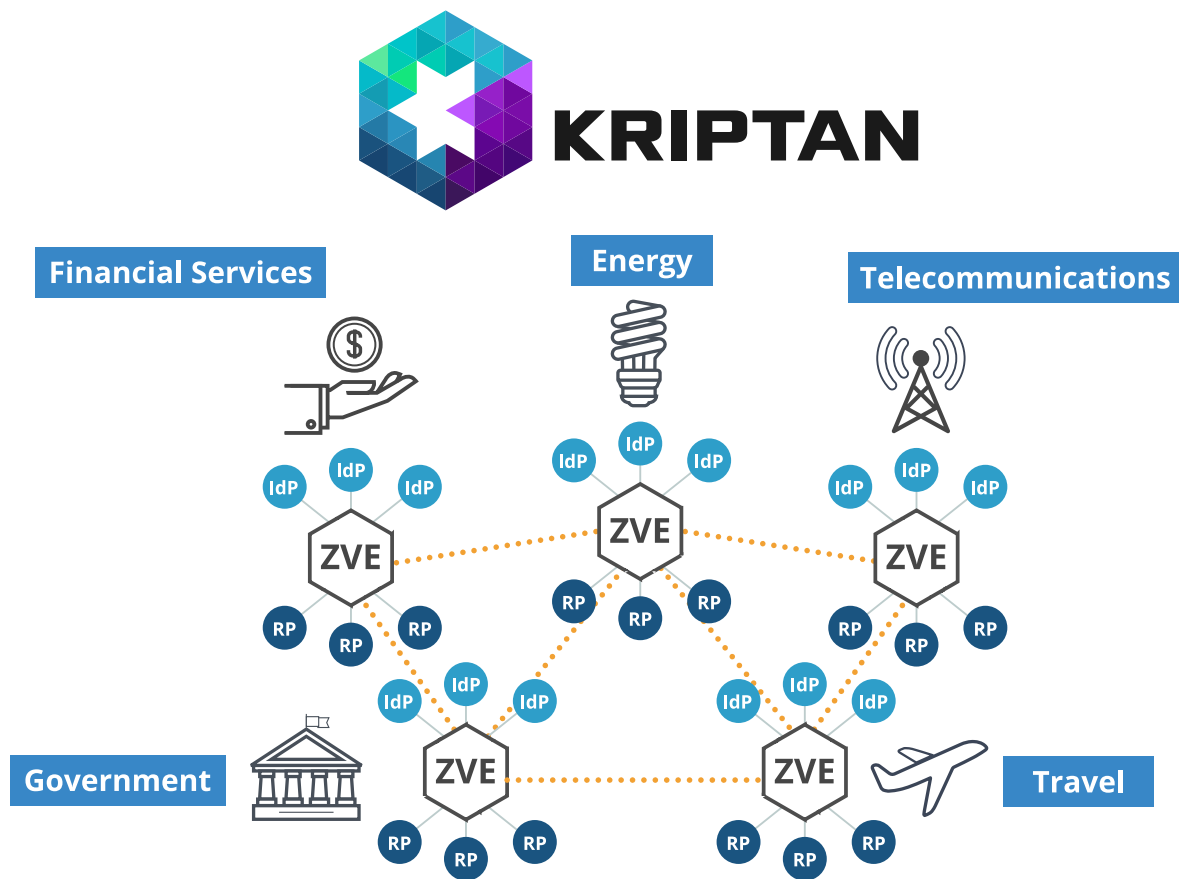
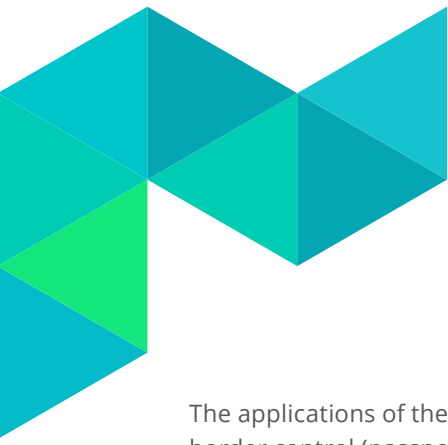


Figure 3: The Kriptan Network

The IdP's in the diagram above represent Identity Providers, and RP's denote Relying Parties, who, need the information IdP's hold to enable transactions. The intermediate nodes are called, ZKP Verification Engines (ZVE), which provide the transaction verification and privacy-preserving capabilities.

The technical details of the Kriptan Network are out of scope for this document, but can be found in the companion document, "Kriptan Network - Technical White Paper."



Opportunities

The Perfect Storm

The applications of the Kriptan Network cover almost every industry. Identity is key for travel, including border control (passports, visas), airport / airline employees and passengers, hotels and car hire. All areas of finance require robust KYC, but identity requirements also cover corporate compliance / employee IDs, facilities access, payments, settlements and regulatory compliance. There are various government requirements for law enforcement, cyber intelligence, justice, military and emergency services. In health, use cases include patient and employee authentication and data management, prescriptions and patient record management.

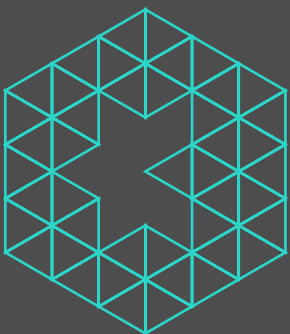
These vast industries have always had these requirements, so an important question to ask is “why now?” Why would governments, businesses and individuals make the changes required to support digital identities today? What has changed to make this a compelling event for all involved?

The answer is that the Kriptan Network takes advantage of a perfect storm of market forces:

- GDPR regulation has had a worldwide impact since it was enforced in May 2018
- There has been a dramatic increase in the number of major data breaches at corporations around the world
- Consumers are demanding more control over their data
- New technology trends, especially blockchains, decentralised networks and digital assets, provide a major disruptive force that will reconstruct the internet over the next five to ten years
- Governments now understand that digital identity is the key to unlocking GDP growth and reducing fraud; they now realise that it is up to them to play their part, through a privacy-preserving integration of citizen information into the digital economy
- Up until now it hasn't been possible to verify personal data without copying this private information; the Kriptan Network's ZKP technology allows this to happen with full privacy protection

In summary, only the Kriptan Network provides all of the capabilities required to deliver public trust, where identities can be verified in real-time by authoritative sources. This is enabled through advanced privacy-protecting capabilities, while facilitating the appropriate regulatory oversight.

To find out more please visit <https://kriptan.org> or email us at contact@kriptan.org.



KRIPTAN