CONNECTX™

A private satellite and server network that eliminates the use of the Internet to securely store digital currency wallets and private keys.

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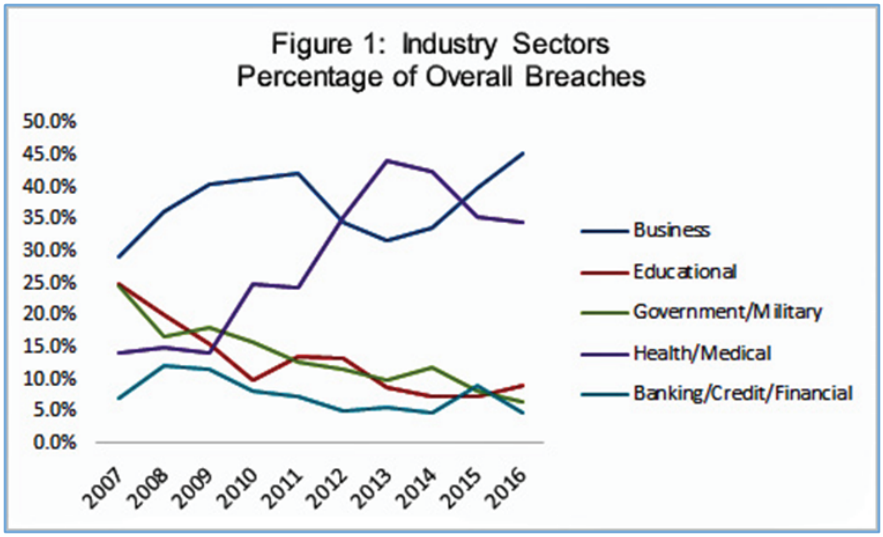
Abstract

The Internet wasn't built with security in mind. Security has always been an afterthought with one solution after another trying to plug the holes. Internet security is cumbersome, expensive and ineffective. Companies and governments have dealt with repeated and horrific data breaches of high value and sensitive information.

This paper details ConnectX's next generation transmission and storage technology that completely eliminates the use of the Internet. This "Internet-less", private network will be used by the cryptocurrency community to store valuable information like digital wallets and private keys. ConnectX is deploying this new network for digital wallets and storage of private keys, which is above government-level security. We will leverage the cost reductions in the space industry to launch a constellation of small satellites in low earth orbit. This is the least expensive way to deploy new infrastructure but also has other advantages such as lower operating costs and the network cannot be physically accessed. This is the secure platform needed to support and protect private keys and digital wallets.

Problem

The most valuable asset a company or individual has is data. Protecting that data is challenging. Data breaches of private and sensitive information are increasing at an alarming rate. The number of U.S. data breaches in 2016 reached a record high of 1,093, up 40% from 2015 of 780.



The financial sector leads in overall breaches at 45%. Social Security Numbers are also a high value target because of their identity theft value with more than 50% of data breaches that compromised SSN's in 2016.

Any enterprise data storage solution has to store, manage, protect and provide access to data in order to support their business. As companies become more distributed and corporate data grows exponentially, demands multiply.

Large enterprises believe it is too risky to let Cloud Service Providers handle their business-critical and personally identifiable information (PII) of their customers. The type of information that companies and individuals lose to criminal hackers are names, addresses, phone numbers, social security numbers, medical records, tax information, passwords and credit card numbers. The amount of customer records stolen by hackers is staggering:

- **Yahoo!:** 1.5 billion records in 2016.
- **Scottrade:** 4.6 million records in 2015.
- **T-Mobile via Experian:** 15 million records in 2015.
- **TJ Maxx:** 45.7 million records in 2007.
- **Home Depot:** 53 million records in 2014.
- **Sony:** 77 million records in 2011.
- **Anthem Insurance:** 80 million records in 2015.
- **U.S. Government (Office of Personnel Management):** 21.5 million records in 2015.
- **JP Morgan Chase:** 83 million records in 2013.
- **AOL:** 92 million records in 2007.
- **LinkedIn:** 100 million records in 2016.
- **Target:** 110 million records in 2013.
- **Equifax:** 143 million records in 2017.
- **UBER:** 57 million records in 2017.
- **eBay:** 145 million records in 2014

In cloud computing, users and customers do not have control over their personal data or the ability to audit or change the processes and policies that affect them. The server and data you are accessing belonging to you could be in another state or country under their legal and jurisdictional control.
In July of 2017, $32 million worth of digital currency was stolen by hackers who gained access to a website where the digital currency owner was buying and selling Ether (Ethereum's digital currency). In 2014, Mt. Gox had 850,000 bitcoins lost or stolen by hackers, a value at the time of $620 million when bitcoin was priced at $827 per bitcoin. Some suspect Mt. Gox stole bitcoins it had in custody.

Decentralized Crypto-Storage.

The introduction of decentralized storage using blockchain technology like STORJ or IPFS have their benefits. These systems provide incentives for people to lease unused data storage space on their personal computers to the highest bidder. This is a less expensive way for certain types of data to be stored like unimportant personal files and web content. However, even though decentralized storage is encrypted, consumers and enterprises with very sensitive, high value information will not want to store this on individual computers around the world.

Data Security Problems

When enterprises, governments and individuals lose data, they lose money. What are the risks?
MALWARE: Hostile software designed to cause harm, steal data or shut down devices and servers.
INTERNET OF THINGS: Increasingly connected devices offer many more entry points in to information. IoT will be a part of every industry but it hasn't been designed with security in mind.
CYBER ESPIONAGE: The next world war will be fought on a keyboard.
CYBER THEFT/FRAUD: Stealing financial information/identity is nothing new but opportunities for theft will increase as new ways for paying for goods evolve like mobile payments and digital currency.
INSECURE PASSWORDS: Easy-to-crack passwords are still a big risk and high-profile attacks will continue. Password recovery is flawed as security questions can easily be guessed based on information online.

ONE THING IN COMMON: INTERNET CONNECTIVITY.

Commercialization of Space and Small Satellites

Commercial operations in space have occurred for decades. The biggest example is communication satellites which provide a wide range of services such as telecommunications, data communications such as internet, TV broadcasts, etc.
It is projected in 2017, 449 small satellites (nano/microsatallites) will be launched, an increase of 510% over 2016 . Thousands of commercial small satellites (101-500kg) are planned for launch over the next 15 years. Recent multi-million and multi-billion dollar investments in various ventures confirm the commercial sector's continued interest in the small satellite industry.
The frequency and lower cost of small satellite launches means that the playing field in the satellite industry is leveling. It is enabling new companies to solve the world's biggest problems. Most importantly, a company like ConnectX could go from start up to dominate market position using small satellites to securely store high value data 'off-planet'. The first to do this in the new era of satellites will dominate the growing cryptocurrency market and the $86.4B cyber security market.

Current State of Satellite Deployments

Despite the democratization of space, satellites still must operate under limited power and are severely restricted by data transmissions speeds. Satellite companies overcome these issues by making larger, more expensive satellites capable of generating more power and data transmission throughput. SpaceX, as an example, is providing global Internet with an estimated 11,000 satellites, each weighing 650 pounds and the size of a car. This will be at a cost of $5-10 billion over the next 5-6 years. However, ConnectX is not doing this. We will be taking advantage of the innovations and price reductions happening now in the satellite industry to launch smaller, less expensive satellites with the ConnectX-VPN technology in Low Earth Orbit.

CubeSat 3U Satellite similar to what ConnectX will be launching

Data in Satellites

This is something that is already being done. Satellites are computers that process information, store, transmit and receive data to and from earth. ConnectX is leveraging smaller, less expensive satellites to deploy new infrastructure that is more secure and less expensive. However, there are technology challenges to overcome. Should a galactic event occur (like a solar flare) or a satellite becomes inoperable, the ConnectX system needs to be able to recover so that no data is lost and communication is not interrupted. ConnectX has intellectual property on how the system geospatially distributes and replicates information in the satellite constellation to prevent this from occurring. A ConnectX team member was the inventor and architect of the first satellite mesh network for the U.S. Army. He has designed the system to be self-healing, messages are rerouted during communication failures and nodes automatically replicate and distribute data should there be issues. A secondary group of satellites flying at a higher orbital altitude

will provide another data backup. These backup satellite nodes will also fly in to position to replace inoperable satellites in the main constellation.

Why Space?
Less Cost. More Security. Global Accessibility.

Any data storage connected to the Internet is still very susceptible to information security attacks: Equifax, Sony, Target, Anthem and the U.S. Government have all experienced significant security breaches. Through the use of proprietary and patented technology, ConnectX will have a system with security not yet seen in the market. We are deploying new data transmission based on symbolic structures rather than binary code, providing an order of magnitude increase in security. From a security perspective, no one can physically access our system. We eliminate the use of the Internet and provide accessibility anywhere.

Space also gives ConnectX an unfair advantage. Economically, we do not have to pay for real estate, electricity, cooling, staff or security. Because satellites are now much less expensive, this has now become a cost effective way to deploy a new network.

Our Solution

ConnectX was formed to deploy a proprietary data transmission and storage technology ("CONNECTX-VPN") which will be deployed in the first space-based distributed data storage network designed to provide an unparalleled level of security for individuals, enterprises, financial and public sector customers.

ConnectX is developing a proprietary multimode virtual private network (VPN) that operates over low earth orbit (LEO) networks such as Iridium, Globalstar multimode system and existing mobile-cellular public land mobile networks (PLMN) like GSM and CDMA.

The entire global ConnectX financial transaction network will not utilize the Internet in any way. This insures protection from hackers and malware. Your identity, credit file, medical records, sensitive documents etc. in addition to your digital currency wallet will all be stored in the most secure system in the world!

The network is designed to support financial transactions that support our specialized data services that will only be accessible using the ConnectX digital currency hardware wallet. The hardware wallet is a customized data only terrestrial and satellite communication multimode handset.

Proven, Deployed and Commercialized Technology

An early form of this network topology and modulation methods was distributed throughout Australia, Indonesia and Malaysia. The network provided wireless financial transaction services at enterprise locations. However, it only used a land-based network. The network was never hacked, and the ATM machines using this protocol were never

compromised.
ConnectX will deploy fully isolated, distributed network operation centers (NOC) and application service points (ASP) that are designed to provide an unparalleled level of security, performance and ultimately, cost savings to individuals, enterprises, financial, health care and public sector customers.

The Technology

Current transmission technologies are built for a binary environment which is a tremendous security issue. ConnectX is developing transmission technology that is more secure because the network is not connected to the Internet and transmits high value information in a much different way than the way Internet enable devices do. We expect that these advancements will drive substantial security advantages for our satellite and server data storage network.

How it works

Customers pay for our service with our cryptocurrency depending on the amount of data and level of security required. We will also charge a small transaction fee. The private key storage network is designed to work with ConnectX's decentralized blockchain applications and any blockchain protocol.

Our deployment will be done in the following 3 phases with different ways our customers can access the system:

Phase 1 (Secure): Customers will download our ConnectX mobile app allowing secure access to our servers over the Internet. They will then be able to store their wallets in our secure ground-based system. The mobile app uses current state of the art security.

Phase 2 (More Secure): ConnectX will release a hardware device that will communicate with our secure servers using the ConnectX-VPN transmission technology. This eliminates the use of the Internet.

Phase 3 (Most Secure): ConnectX will launch satellites which will store your digital currency wallets and private keys. The hardware device will use the same ConnectX-VPN symbol transmission technology directly connecting to our satellites. This not only eliminates the use of the Internet but your wallet cannot be physically accessed.

Infrastructure Components

Prior to the satellite launch and hardware availability, ConnectX customers will be able to store high value data in our terrestrial-based secure system.

The ConnectX satellite system will consist of:

ConnectX Hardware Device – Device that connects directly to the terrestrial network and the ConnectX satellite system. This uses the ConnectX-VPN symbol data transmission technology with no connection to the Internet. This device eliminates the use of the Internet entirely.

As the ground-based solution is operational, we will be deploying our satellites that will store digital currency wallets and private keys. This is the number of satellites required to achieve the following:

12 Satellites: Completes one orbital ring giving 24/7 access.

108 Satellites: Global Accessibility and 24/7 access.

ConnectX Advantages/Unique Value Proposition

- Game-changing data storage and transmission technology.
- Unparalleled information security advantage enabled by CONNECTX-VPN technology.
- Space gives us drastically lower operating costs and energy consumption.
- Physical access is prohibitive and there are no cross-border legal or jurisdictional issues.
- Eliminates the use of the Internet.

Market Trends

Cryptocurrency: It is becoming common that blockchain companies can issue their own digital currencies. This is an important part of the solution for ConnectX as it allows our customers to make easy, frictionless payments for our data storage and commodity trading transaction fees.

Satellites: No longer is it large companies and governments that can launch satellites. College students and startup companies are now launching less expensive and smaller satellites called CubeSates (10cm cubes). This means that the playing field in the satellite industry is leveling. For ConnectX, this provides a network that cannot be physically accessed and a much more cost effective way of deploying new network technology.

The Blockchain: The global market capitalization of bitcoin supply in circulation, as calculated by the daily average market price across major exchanges, was $252 billion at the start of 2018, up from $16.5 billion at the start of 2017 and $6.4 billion at the start of 2016, according to Blockchain Luxembourg. On February 4, 2018 the total market capitalization of all 1512 crypto assets reported across 8569 markets, according to CoinMarketCap, was $392.8 billion, with BTC dominance at 35.3%.

Currenct blockchain technology has limitations in scaleability, security and is resource intensive. ConnectX will be deploying a "blockchain-less" immutable ledger within our ground and satellite network that solves these problems.

Cyber Security: Data security is a $86.4B per year market with breaches on the rise. Financial transactions, digital wallets and private keys will increasingly become the target for hackers.

Challenges		**Existing Solutions**	**ConnectX Enabled Satellite Nodes**
Information Security and Consumer Privacy	Increasing digitization and automation of more devices across different areas of modern urban environments.	The number of U.S. data breaches hit a record high of 1,093 in 2016, exposing more than 85M records.[8]	Level of security not yet seen in the market by eliminating the use of the Internet.
Security (physical)	Focus on protection from man-made and natural disasters.	Limited access, isolated bunkers, surveillance, etc.	Satellite nodes that cannot be physical accessed.
nterprise Storage Management	Data growth increases security complexity and impacts availability requirements; demand for more storage capacity	The incorporation of more data into traditional IT has proven more difficult than anyone expected.	Unparalleled data security.
Energy Efficiency	Rising energy prices and energy consumption	Account for 70% of operating costs; 1 data centers energy use can equal that of 180,000 homes	Cooling is a non-issue and power is generated by solar panels at no metered cost.

CONNECTX'S MISSION

To store every cryptocurrency wallet and private key in our system.

Blockchains: Public vs. Private vs. Autonomous Satellites

Blockchains are accounting ledgers that cannot be changed and are shared by many people and computers that have a method of agreeing on new transactions.

There is an ongoing debate on whether it is better to have a private blockchain or one that is open and shared with the public.

The advantages of PRIVATE blockchains are:

1. The consortium or company running the private blockchain can, if needed, make changes if something goes wrong, change the rules of the blockchain or revert transactions. However, this could be viewed as a disadvantage as the company in control "is in control".
2. The computers and people validating the transactions are known so an attack on the ledger by a group or majority of validators does not apply.
3. In general, you remove a number of attack scenarios by keeping the network/blockchain private.
4. Transactions are less expensive since fewer nodes need to verify transactions. Private blockchains use much less computing and electrical power than their public blockchain counterparts.
5. Nodes can be trusted in a private blockchain/network.
6. Private blockchains have a high degree of privacy and provide greater scalability.

The advantages of PUBLIC blockchains are:

1. Promotes freedom, neutrality and openness.
2. Public blockchains provide a way to protect the users of a cryptocurrency from the developers by restricting what the developers can do to the blockchain.
3. Because public blockchains are open, they are likely to gain from the network effect.
4. Everyone can see every transaction. However, this could be argued as an issue for some users who prefer privacy.

The ConnectX satellite constellation which is a private blockchain run by autonomous satellites brings to the market most of the advantages of both PUBLIC and PRIVATE blockchains. It has the following characteristics and advantages:

1. Satellites, acting independently, running a blockchain do not have a company which could "take control" of the ledger.
2. There are no "miners" that could team up to commit a 51% attack. A 51% attack is where someone or some entity gain control of 51% or more of the computers in the blockchain network and are able to change the ledger and transactions.

3. Each node is trusted as it only talks to others in the closed, private network which eliminates the use of the Internet. This removes attacks from untrusted nodes and Sybil attacks, etc. A Sybil attack is when a computer or node in a network is used to falsify multiple identities in attempt to cheat or hack the system.
4. Because it is private, there are fewer nodes lowering the need for large amounts of computing and electricity, increasing scalability.
5. It does not get more sovereign or private than Outer Space. Furthermore, there are no laws or jurisdictional issues 'off-planet'.
6. The satellite nodes execute on the ledger and are completely neutral.

Applications

The ConnectX system attracts a segment of the marketplace that performs very large transactions that can take a long time with lots of people involved, privacy and security are paramount and where the parties in the transaction don't trust each other.

Operating Plan and Path to Commercialization

	Phase I	Phase II	Phase III	Phase IV
Financing	$7M	$13M	$20M	$180M
Milestones	• Completion of middleware database development and satellite blockchain ledger software. • Fly our satellite payload in high altitude balloons to demonstrate the system working in space. • CONNECTX-VPN transmission prototype is in place and proven in terrestrial environment and space • Exportly Product Module released on terrestrial blockchain and generates revenue. Hardware device for Storage is released.	• 3 satellites launched to demonstrate one orbital ring with 9 connected nodes on earth to the 3 in orbit. • Commence sales and marketing initiative • CONNECTX-VPN transmission is further proven in space environment • Data is sent, received and stored in our satellites via our ground stations from our network operation centers.	• Launch of the remaining 9 earth connected nodes to complete one orbital ring with 1 ground station, 24x7 access and data entirely off-planet. • Continue sales and marketing initiative • Commence licensing program of the chip/device for transmission and storage technology connecting to the ConnectX satellite constellation. • Release of the hardware device which connects directly to our satellites.	• Commence rollout of remaining satellites to complete global 108+ satellite distributed network. • Continue satellite rollout. • Continue sales and marketing initiative. • Continue licensing program.

Tokenomics

For digital wallet storage, there will be a small storage fee for storing your digital wallets and private keys in our system. These private keys can also store more sensitive information like passwords, passports, credit card numbers, investment and bank account information, birth certificates, and Social Security Numbers. ConnectX will only accept our cryptocurrency as payment for data storage. Data storage space can be leased or owned. If customers purchase data storage, that space is tokenized as ownership and can be sold to others whenever they like.

Key Partnerships

Zero2Infinity – High Altitude Balloon launches to test satellite payloads prior to satellite launches. With their system, we are able to test our payloads at 30 Kilometers/100,000 feet at a fraction of the cost of satellite launches.

Cannae – Propellant-LESS engine for satellites. With this technology, we do not need to include propellant in our satellites to keep them "on station" (in a specific orbit). This extends the life of each satellite node, lowers the initial altitude during launch and allows us to change the satellites orbit altitude during operation.

Spacecraft Manufacturer – We have partnered with a well-known small satellite manufacturer and can release this information under NDA.

Launch Provider – Depending on the pricing and launch location of the various providers, we will choose the best option in time to share the rocket payload to deploy our satellites in incremental steps.