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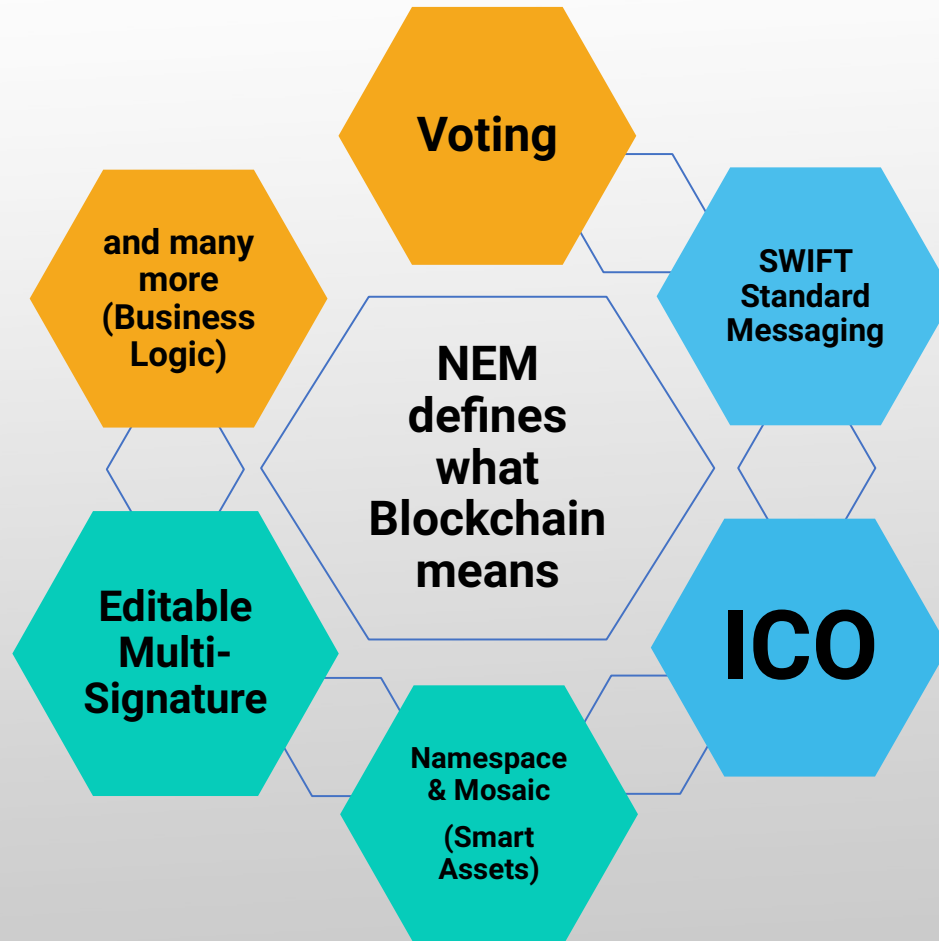
# XEM Digital Smart Assets

**Fernando Ruiz-Tapiador**

**NEM Ambassador**

**A Coruña**

**CIBTC 15-Dic-2018**



# Message

- Swift Messaging Compatible
- Available in unencrypted, encrypted and hexadecimal
- Shared Secret
- Standards

# Multisig

- M-of-N feature
- 64 Cosigners
- Private key of Multisig wallet

## Services



### Multisignature and Multi-User Accounts

Multisig accounts are editable on-chain contracts, the most powerful way to secure funds, enable joint accounts, and are the foundation of DAOs.

[Convert an account to multisig](#)

[Edit an existing contract](#)

[Sign multisig transactions](#)



### Namespaces & Subdomains

Namespaces are domain names. Each namespace is unique and authenticates mosaics (assets) issued on it or on its subdomains.

[Create namespace](#)

[Renew namespaces](#)



### Delegated Harvesting

Delegated harvesting is the feature that allows "mining" even while your account is closed.

[Manage delegated account](#)

[Manage delegated account of multisignature accounts](#)



### Apostille

Use the NEM Apostille service to create blockchain based notarizations to time stamp, follow and audit file authenticity.

[Create](#)

[Audit](#)

[History](#)



### Mosaics

NEM mosaics are assets that expose additional properties and other features. To be able to create a mosaic, an account must rent at least one root namespace.

[Create mosaic](#)

[Edit mosaic](#)



### Changelly Instant Exchange

Use the Changelly widget to buy XEM at the best rates!

[Buy XEM](#)



### Address book

Assign labels to addresses to easily keep track of your contacts.

[Manage address book](#)



### Voting

Create and vote on polls

[See Polls](#)

[Create Poll](#)

**NEM Wallet**  
([www.nem.io/download](http://www.nem.io/download))

# Namespace

- Decentralized DNS
- 3 levels, e.g. nem.malaysia.kualalumpur
  - 1<sup>st</sup> level (a.k.a Root): nem
  - 2<sup>nd</sup> level (a.k.a Sub-namespace 1): malaysia
  - 3<sup>rd</sup> level (a.k.a Sub-namespace 2) :  
kualalumpur



### **NEM is a native Namespace**

- ❑ Namespace is a name, it can represent the name of the organisation.



### **XEM is a mosaic, native currency of NEM**

- ❑ A mosaic is an asset in NEM. Mosaics are good for cryptocurrencies, stocks, coupons, IOU's, fiat pegs, and any other kind of financial asset.



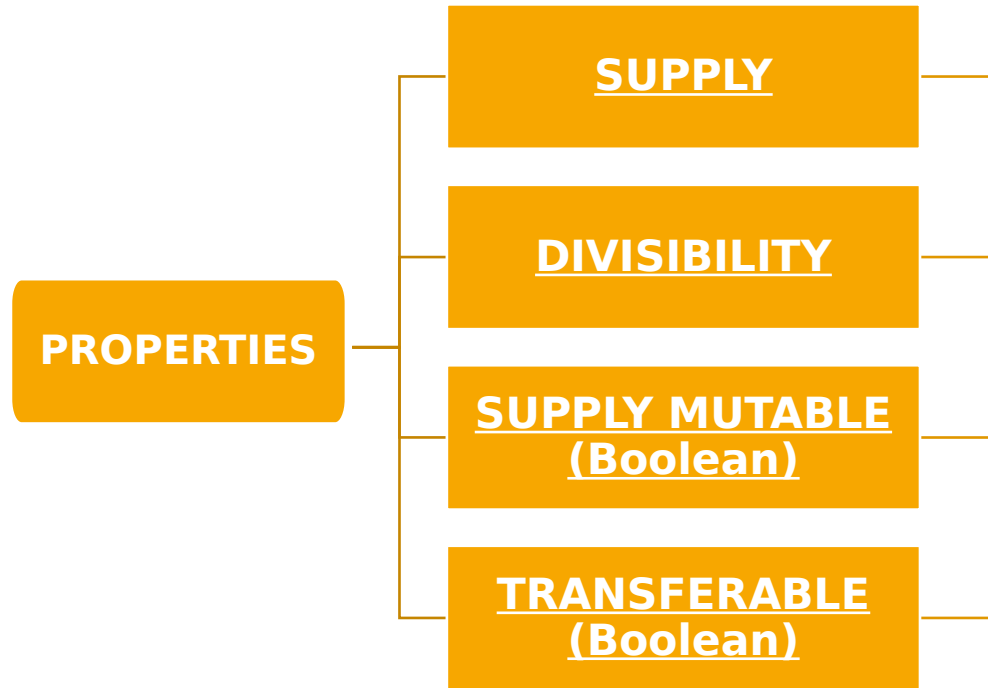
# NEM Wallet Services Station

# Mosaic

- Asset, Token, or Anything present value etc.
- Attached to a namespace and unique on the namespace level e.g.
  - **nem:xem**, **nem:coin**, **nem:token**
  - **nem.malaysia:xem**, **nem.malaysia:coin**
  - **nem.malaysia.kualalumpur:xem**

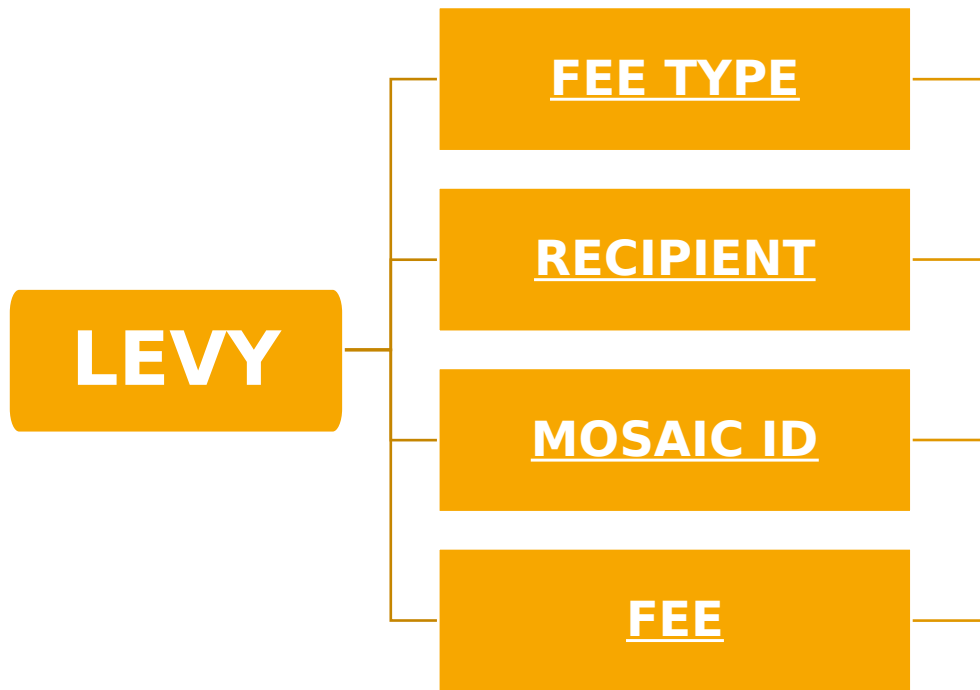


# Mosaic definition (properties)



```
{
  "timeStamp": 9111526,
  "fee": 150000,
  "type": 16385, // Transaction Type
  "deadline": 9154726,
  "version": -1744830463, // Network Version
  "signer": "cbda3edb771d42801a5c6ce0725f9374efade19a8933d6ac22ccfa50c777d0f9",
  "creationFee": 10000000,
  "creationFeeSink": "53e140b5947f104cabcd2d6fe8baedbc30ef9a0609c717d9613de593ec2a266d3",
  "mosaicDefinition": {
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    "description": "precious vouchers",
    "id": {
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      "name": "Alice's gift vouchers"
    },
    "properties": [
      {
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        "value": "0"
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      {
        "name": "initialSupply",
        "value": "1000"
      },
      {
        "name": "supplyMutable",
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      {
        "name": "transferable",
        "value": "false"
      }
    ]
  },
  "levy": {
    "type": 1,
    "recipient": "TD3RXTHBLK6J3UD2BH2PXS0FLPWZ0TR34WCG4HXH",
    "mosaicId": {
      "namespaceId": "nem",
      "name": "xem"
    },
    "fee": 10
  }
}
```

# Mosaic definition (Levy)



```
{
  "timeStamp": 9111526,
  "fee": 150000,
  "type": 16385, // Transaction Type
  "deadline": 9154726,
  "version": -1744830463, // Network Version
  "signer": "cbda3edb771d42801a5c6ce0725f9374efade19a8933d6ac22ccfa50c777d0f9",
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  "creationFeeSink": "53e140b5947f104cabcd6fe8baedbc30ef9a0609c717d9613de593ec2a266d3",
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      "value": "1000"
    }, {
      "name": "supplyMutable",
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    }, {
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  }
}
```

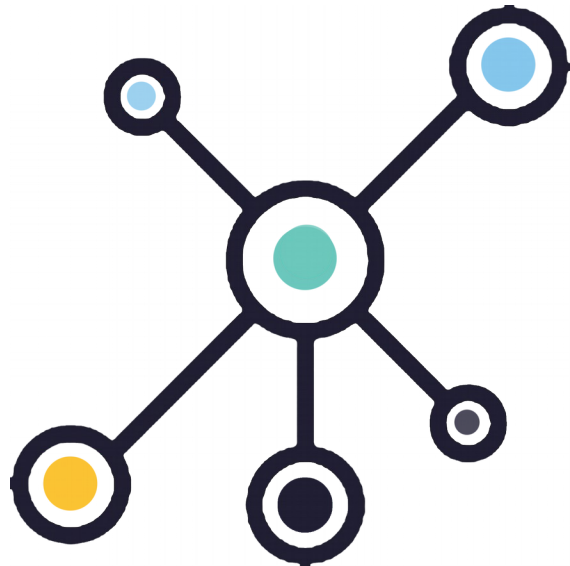
# What is Catapult?

## The Blockchain Optimized for Business Data

Catapult is a full-featured blockchain engine that can power both private and public networks with its unique built-in features.

These features enable bulletproof digital asset creation, decentralized swaps, advanced account systems, and business logic modeling.

In its next phase, Catapult will become the core NEM engine.



# What's new?

Besides making great improvements to speed and scalability, Catapult introduces:

- **Aggregated Transactions**
- **Multi-Level Multisignature Accounts**
- **Cross Chain Transactions**

# Aggregated Transactions

- Aggregated Transactions merge multiple transactions into one, allowing trustless swaps, and other advanced logic.
- Catapult does this by generating a one-time disposable smart contract.
- When all parties have approved the transaction, all of them are executed at once.

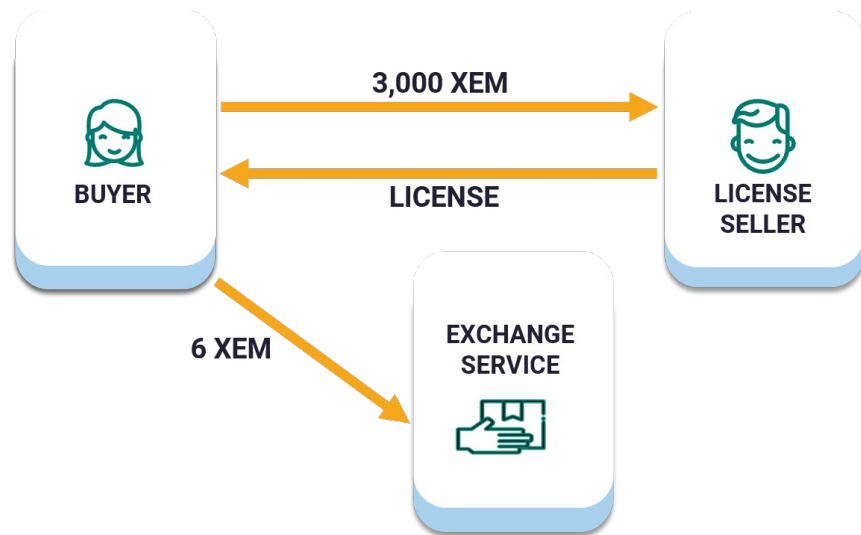
# Aggregated Transactions

## Decentralized Swaps

In this example, a buyer wants to purchase a license (such as media usage rights) for 3,000 XEM.

The license is listed for sale on an exchange, but she prefers to keep all her private keys off exchanges.

Catapult automatically creates three transfers needed to make a trustless swap.

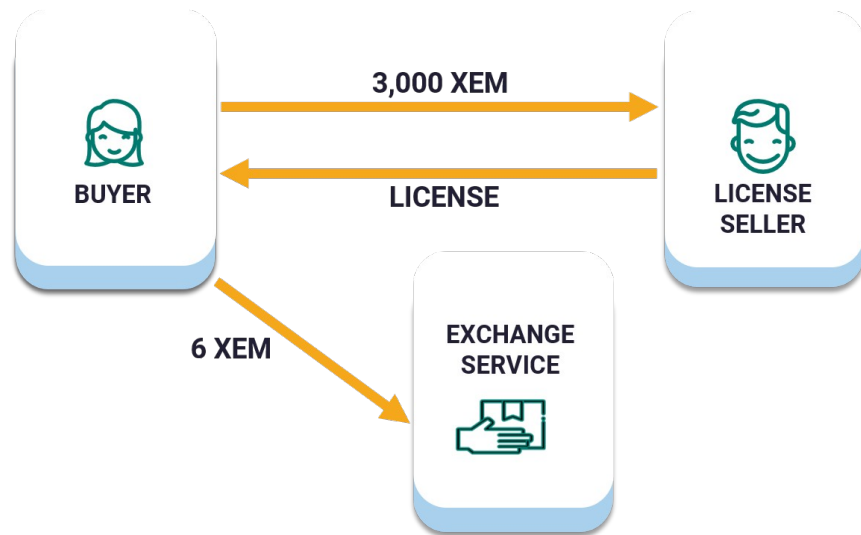


The exchange receives its fee even though it never held either party's property.

# Aggregated Transactions

## Decentralized Swaps

- 3,000 XEM transfers to the seller
- The license transfers to the buyer
- An exchange fee of 6 XEM transfers to the exchange



The exchange receives its fee even though it never held either party's property.

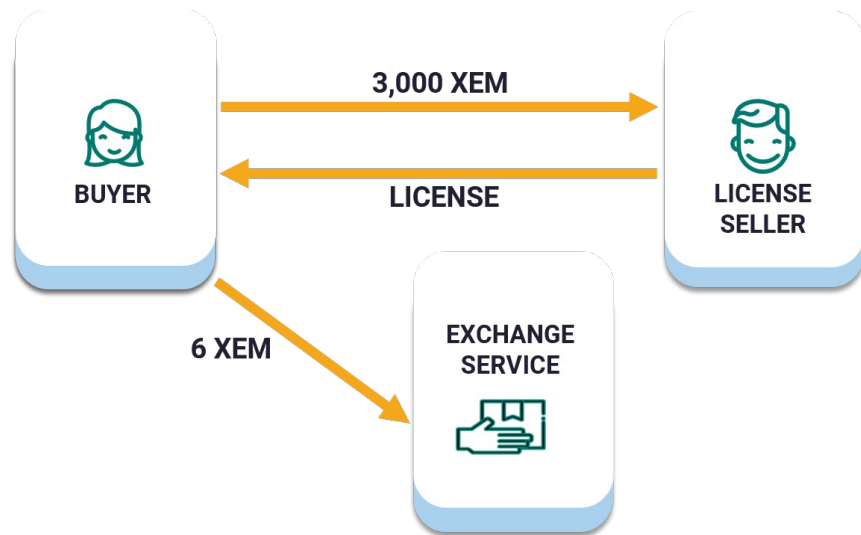
# Aggregated Transactions

## Decentralized Swaps

Catapult executes all these transfers simultaneously as one transaction.

This built-in escrow means all the transfers succeed together or they all fail together.

Note that while transactions may be facilitated by exchanges, they never hold your keys, so the funds can't be seized or interrupted.



The exchange receives its fee even though it never held either party's property.

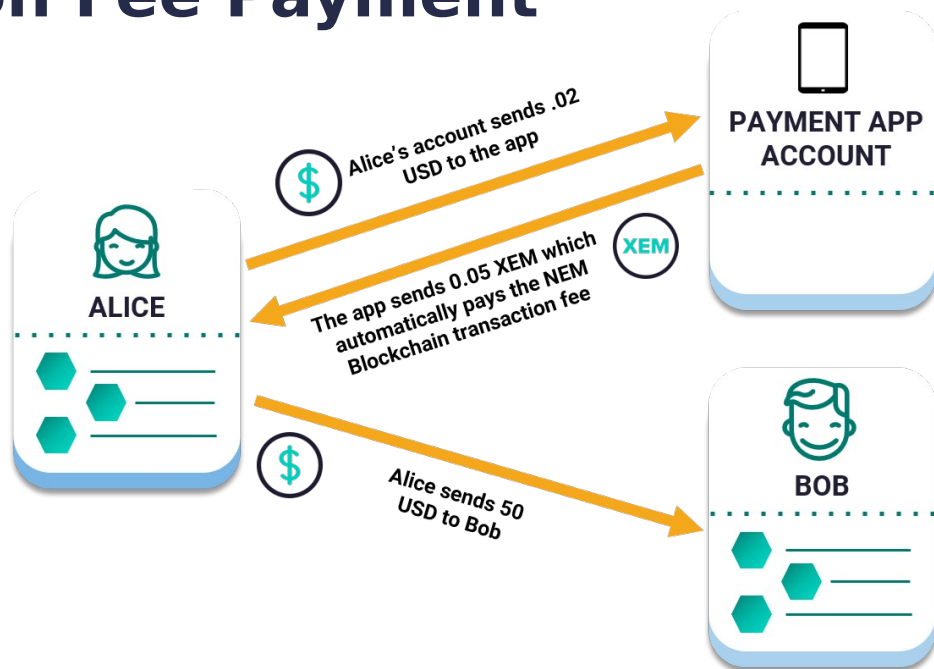


# Aggregated Transactions

## Automatic Transaction Fee Payment

Alice sends \$50 USD to Bob using a payment app, but she doesn't have any XEM to pay the blockchain transaction fee.

Catapult can automatically convert USD to XEM to pay the fee.

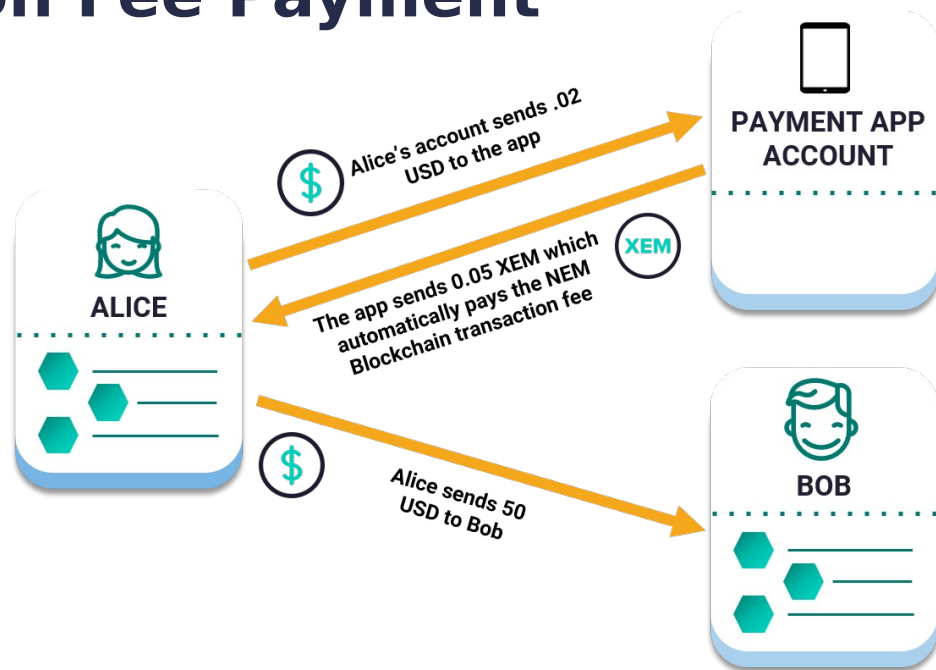


# Aggregated Transactions

## Automatic Transaction Fee Payment

Now Alice and Bob can use the Catapult blockchain without ever having to buy or hold XEM.

Since the app creator can put their own branding on the open source payment app, Alice and Bob may not even know they are using Catapult.

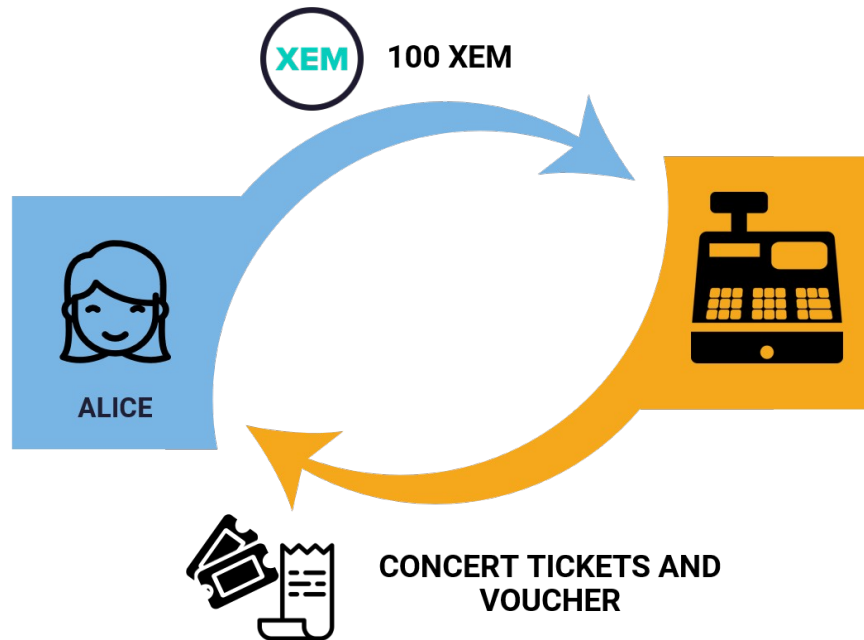


# Aggregated Transactions

## Multi-Asset Escrowed Transactions

In this example Alice is buying concert tickets with XEM. Since she is buying during a special promotion, she also gets a voucher for a concert T-shirt.

On other blockchains, these kinds of combined trustless transactions are impractical. Catapult makes them easy and secure.



# Multi-Level Multisignature Accounts

- Another new Catapult feature is multi-level multisignature accounts, this adds “AND/OR” logic to multisignature transactions.
- You can also think of this as “nested signatures.” This allows a wide variety of business logic.

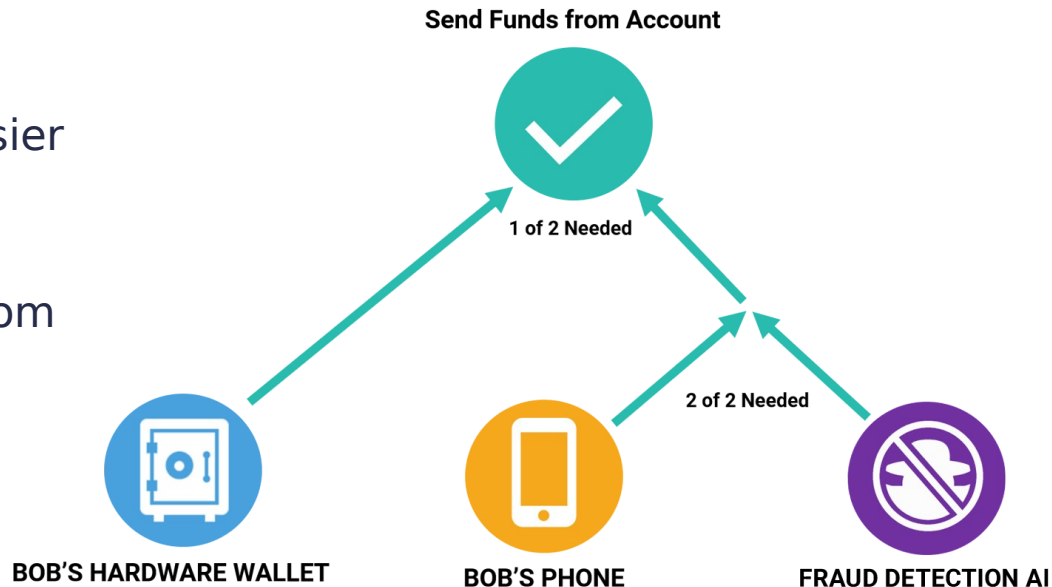
# Multi-Level Multisignature Accounts

## Fraud Detection

This example shows how a high security account can be made easier to use.

Transactions are only approved from a hardware wallet OR your phone AND a fraud detection AI.

This allows a variety of security configurations at the protocol level to keep businesses and their customers hack-free.

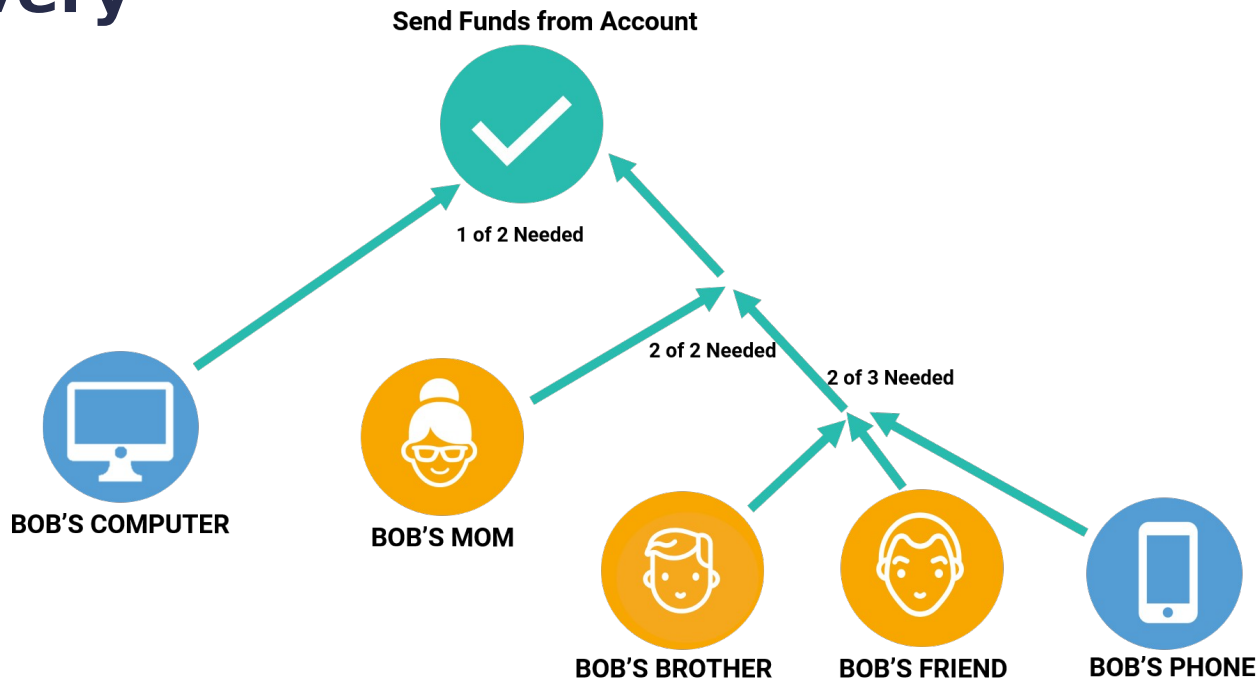


# Multi-Level Multisignature Accounts

## Account Recovery

You can set up your account so it can be recovered only with the approval of signatures from specified accounts, such as your friends and family.

Combine the branches any way you like.

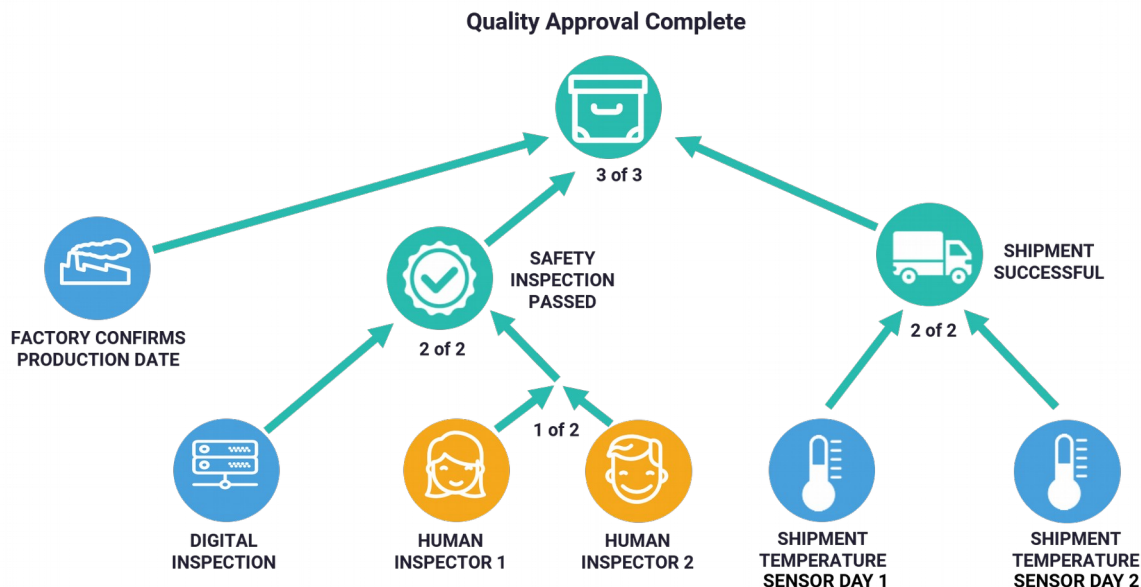


# Multi-Level Multisignature Accounts

## Manufacturing & Supply Chain

In this example, a manufacturer is shipping a pharmaceutical product.

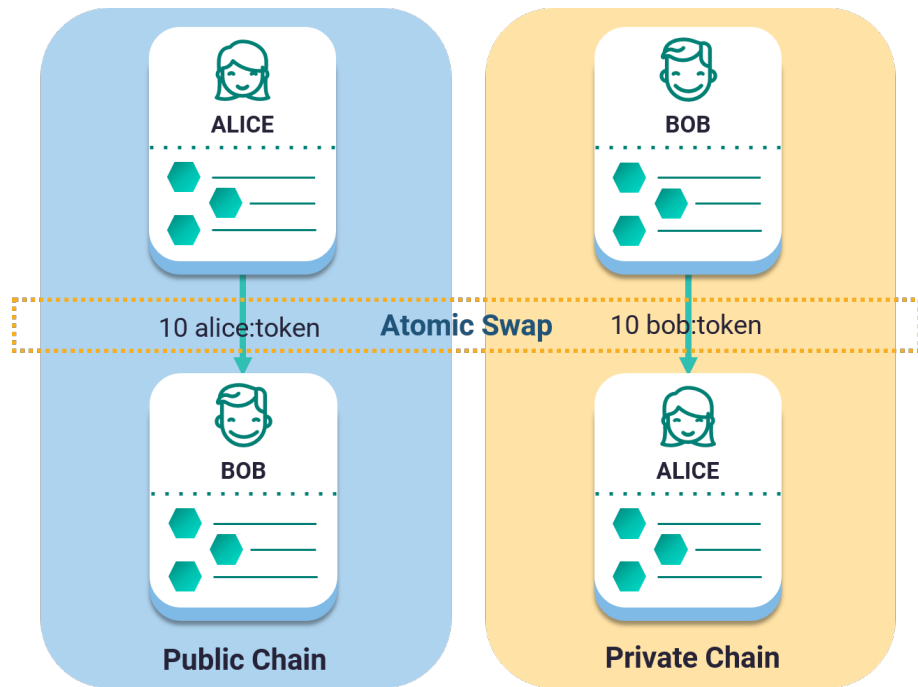
The product receives its quality approval only when its blockchain record shows it has a production date, safety inspection, and was shipped at the correct temperature.



# Cross Chain Transactions

## Secret Lock Transactions

- Alice and Bob want to exchange assets in different Catapult blockchains.
- They don't trust each other nor a third party.
- Catapult provides secret lock / proof mechanism, allowing atomic cross chain transactions.





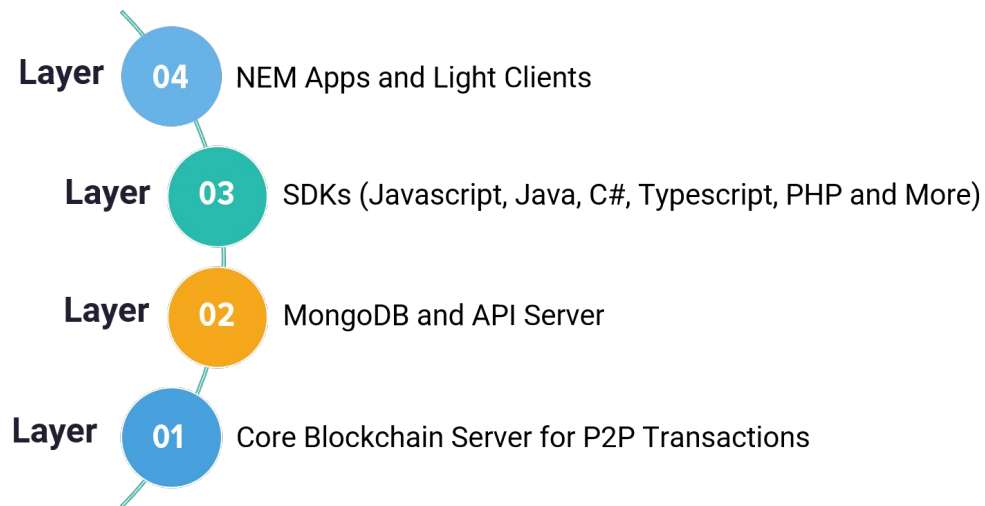
# Catapult's Performance Advantage

## A Four-Layered Architecture



The four-layered architecture keeps each layer free from being slowed down by the others, so API calls and data queries can respond quickly even with high traffic.

Developers can update any of these tiers without disrupting the others, improving security.



# More Catapult Use Cases

**Together, all these features make Catapult a complete blockchain solution for a huge number of use cases:**

- Cryptocurrencies
- International Remittance
- Exchanges
- Bank Accounts
- Securities Trading
- Registrations
- IOT Micropayments
- Insurance
- ICOs and Utility Tokens
- Loyalty Rewards Points
- Inspection Records
- Notarizations
- Copyright Management
- Sharing Economy
- Trading Cards
- Voting
- Customer Relationship Management
- Compliance and KYC Records
- Logistics Tracking
- Telecom Accounts
- Medical Records
- Automatic Accounting
- User Identity Verification
- Time Logs
- Scientific Data Records
- Encrypted Messaging and Storage
- Social Media



Page 1 of 4



Pantos

An open-source, innovation-driven research project that brings all major blockchain platforms closer together, setting new standards for decentralized cross-chain token transfers



XPOS

An ecosystem that aims to empower a new economic model driven by cryptocurrencies, blockchain, loyalty programs, and a crypto-payment gateway infrastructure

choice

Choice

A payment gateway that aims to redistribute half of the transaction fee to a charity of your choice

giving ledger

Giving Ledger

A blockchain-based solution that brings transparency and sustainability to impact-driven philanthropy, offering the most worthwhile way to donate and invest your crypto asset



Free Market Token

A powerful utility token enhancing the e-commerce experience while rewarding and protecting both shoppers and merchants on Ecryptostore.com



Xarbon

The world's first digital carbon assets that are fully reserved 1-to-1 by traditional carbon instruments



Cache

A platform that builds tools to make blockchain usable for developers and businesses



Blockstart

A platform that helps developers build mobile apps and games on the blockchain



Agrello

Provides an AI-powered interface allowing you to build smart contract-based legal agreements on the blockchain



ProximaX

An advanced extension of the Blockchain and Distributed Ledger Technology (DLT) with utility-rich services and protocols



Devslopes

An effective platform for beginner to advanced developers to learn how to code on the blockchain



COMSA

Comsa

A one-stop solution for centralized businesses to adopt blockchain technologies



NEMWILL

A will-writing platform that preserves your crypto assets so that you can leave your beneficiaries with sizeable digital fortunes and assets after you pass on

ENVIRONMENT

E-COMMERCE



Pillar Project

Aims to develop a decentralised solution for data management and return control over personal data back to its rightful owner—you

COLLABORATION

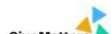
nem  
USE CASES

PLATFORM

PAYMENT

CHARITIES/  
DONATIONS

MUSIC



GiveMatters

A free application that connects charitable organizations by providing a community hub to share news, initiatives, projects, and success stories



Tune

A blockchain software development company that powers the music collaboration ecosystem Cre8tor.app (formerly RecordGram)



Eroiy

A blockchain-based cryptocurrency, specifically designed as an anonymous payment method to protect the privacy of the buyers from the online entertainment industry



TravelbyBit

Provides digital currency payment platform to a network of merchants around Australia



Graft Network

A global, open-source, blockchain-based, decentralized payment gateway with real-time authorizations



PundiX

Empowering blockchain developers and token holders to sell cryptocurrency and services at any physical store in the world



Paytomat

A platform to incentivize transactional usage of crypto through a decentralized network of point-of-sale terminals





Page 2 of 4



**Mhub**  
Transforming the property sector through blockchain-powered property registration and verification



**C-Estates**  
A one-stop shop for real estate transactions



**EMPLEOS**  
A new technology platform that brings blockchain, machine learning, and rewards system into the online recruiting market



**LocationCore**  
A product of Digital2Go that rewards users who share their location data



**LoyalCoin**  
A product of AppSolutely Inc. that allows you to earn and spend loyalty points anytime, everywhere



**Breeze**  
A private social platform to communicate with the people you care about



**TokenPost**  
Provides news and analysis on trends, technologies, and companies in the blockchain ecosystem



**ShelterDAO**  
Aims to decentralize real estates and build crypto communities by implementing blockchain technology

## SOCIAL MEDIA

## REAL ESTATE

## LOYALTY/REWARDING

## RHOVIT

**Rhovit**  
A blockchain-based streaming media platform that incentivizes both content creators and users



**Brifs**  
Bringing mass US adoption of the NEM blockchain with a discount gift card marketplace



**Cachout**  
A platform where developers can be rewarded by helping others solve their code problems



**Qchain**  
Building a blockchain-powered branded content, influencer marketing, and sponsorship purchasing platform



**Brifs**  
Bringing mass US adoption of the NEM blockchain with a discount gift card marketplace



**Cachout**  
A platform where developers can be rewarded by helping others solve their code problems

## ZEUS

**Zeus Exchange**  
A hybrid trading platform that enables anyone to invest in financial markets and crypto



**Zaif**  
A major regulated Japanese cryptocurrency exchange with notable features such as instant exchange, margin trading, Bitcoin futures, and interest payouts



**Token AI**  
Enables crypto traders to harness the power of its proprietary AI-driven toolkit to maximize portfolio performance



**NEMChange**  
An exchange platform where users can sell and buy NEM-based tokens (mosaics)



**Bistox**  
An advanced semi-decentralized cryptocurrency exchange for traders with different levels of knowledge



**ATUMChain**  
A decentralized cryptocurrency trading platform that provides client to client trades without depositing funds in the exchange, and provides clearing of these settlements



**Adara**  
A regulated hybrid securities and digital assets exchange built for community-driven algorithmic trading



**Watermelonblock**  
Provides real-time actionable insights and detailed contextual analysis for investors, at the press of a button

## EXCHANGES/TRADING

## AUTHENTICITY



**Open Apostille**  
A service with which you can share your blockchain-notarized file created on the NEM Apostille



**Apostille**  
Blockchain notarizations that are transferable, updatable, branded, and jointly-owned

## PROVER

**Prover**  
An independent assistant that helps authenticate and verify video content



**CopyrightBank**  
Copyright registration and verification platform for digital works



**LuxTag**  
Provides proof of ownership and authenticity using blockchain technology

# nem USE CASES

## SECURITY



**Safekee**  
The world's first secure decentralized cryptokeys cold-storage service, made available to the masses via a multi-currency crypto wallet



**Brifs**  
Bringing mass US adoption of the NEM blockchain with a discount gift card marketplace



**Cachout**  
A platform where developers can be rewarded by helping others solve their code problems



Page 3 of 4



Sernez

A peer-to-peer student education lending and scholarship platform



Day by Day

An asset registry management solution built on the blockchain, targeting the insurance industry



Bankera

A digital bank that aims to reduce the number of counterparties, thus lowering the cost of banking for the end users



myCoinvest

A smartphone app that features automated savings accounts, online marketplace, currency exchange, gift card redemption, and remittance tools



Chronobank

A blockchain project aimed at disrupting the HR/recruitment/finance industries



PolicyPal Network

A twofold vision of addressing key issues that overlap the fields of both insurance and cryptoassets in the world



LATTICE80

Building an ecosystem, called KAYA Network, to connect the various stakeholders in fintech and blockchain



Bankorus

Formerly MiCal, Bankorus is an AI-powered, crypto-wealth management platform, and security token marketplace built on the blockchain



DarcMatter

An award-winning global fintech investment platform that provides transparent and direct access into alternative investments



Ethyl

Decentralizes the internet of things and supports open standards such as Z-Wave, ZigBee, and general RF, as well as IP-based APIs for existing smart home devices



Ministry of Community Development

Seeks to improve the social development in Emirates by achieving the objectives of national agenda for the Emirates Vision 2021AD



VERSES

An integrated blockchain-based protocol for Web 3.0 that enables the secure authentication, interaction, transaction, and transfer of virtual assets across devices, platforms, and virtual or geo-locations



ScanetChain

A decentralized open platform that uses AR to provide a space where users can freely define and sell their content and products for royalty and disclosure fees



Fluffr

A reward token protocol for building, promoting, and engaging in augmented reality experiences



Mobi

A ride-sharing app that connects neighbors and colleagues with each other to carpool to work or university



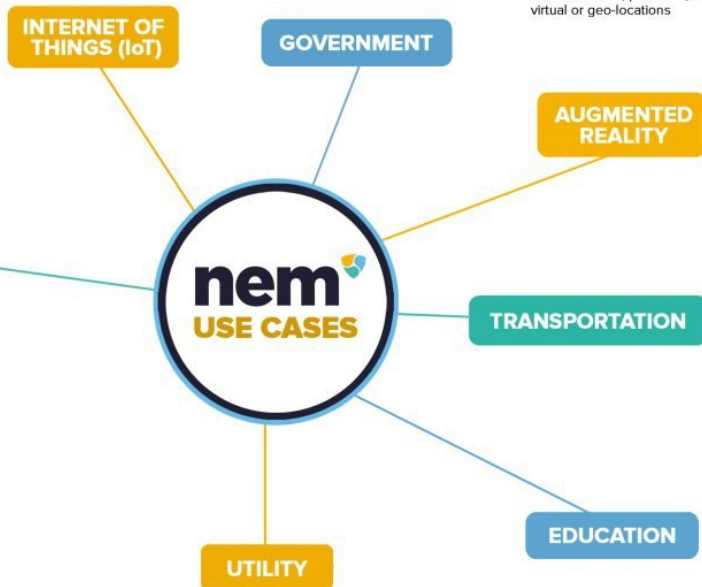
Tutellus

A platform that pays the user for learning



Skillonomy

An online educational DAO and skill monetization platform for IT, e-Sports, poker, and cryptotrading



Solo

Building the power plant of the future—the Virtual Power Plant, a connected system of distributed batteries and electric vehicles in homes and businesses across the grid



Bitlumsens

Building a decentralized, blockchain-based micro power-grid for the 1.2 billion people without access to electricity and banking



Rocketshoes

An educational platform designed with a learner-centric approach, providing powerful tools to manage content in a decentralized way







Page 4 of 4



#### ReadyPlayGo

A revolutionary, fully regulated gaming platform that offers unique gaming experience for its players and net new revenue opportunities for game developers and publishers



#### GameFix

A product of CerebralFix that is integrated into the NEM blockchain through the use of the Xarcade SDK



#### Pac-NEM

A free and open-source node.js autonomous game inspired by Pac-Man



#### Japan Gibler Promotion Association (JGPA)

Streamlines the meat supply chain process, enabling consumers to trace the history of the meat, from the hunting grounds to the dinner plate



#### Hit Foundation

An equitable and sustainable healthcare enabled by a decentralized marketplace for personal health data



#### InstaPract

A blockchain-based telehealth platform that supports and scales healthcare institutions, from personal clinics to chains of hospitals



#### Gem3s Technology

A professional software development and services company that creates innovative, value-centric technology solutions for customers across the globe



#### Aequalis

Provides custom software solutions and services to meet the ever-evolving needs of the business community



#### PeerStream

Formerly SNAP Interactive, helps clients identify advantageous distributed technology strategies and integrate public and private blockchain solutions to advance their business objectives



#### Asta Solutions

An end-to-end blockchain solution provider capable of delivering solutions across the globe



#### 482 Solutions

A solid technology team that builds the infrastructure, applications, and practices that enable a decentralized world

#### Poliilo9

##### PoliPoll

A platform project that aims to meet the needs of both politicians and voters by creating economic zones using token economy



#### Chainzilla

A 4th gen blockchain as a service provider for NEM, Komodo, QTum, and Ethereum network



#### CerebralFix

A gaming studio, in collaboration with Xarcade, that envisions creating web and mobile games based on NEM blockchain technology



#### He3 Labs

An elite technology consultancy and development firm focused on architecting, prototyping, and deploying system solutions to real-world business and social needs using blockchain technology



#### Tech Bureau

A fintech and cryptocurrency group company in Japan, the U.S., and Europe, which develops software and services for blockchain technology

## HEALTH

## GAMING

## SUPPLY CHAIN



## SYSTEM INTEGRATORS



#### Digital2Go

Connecting physical and digital behaviors, and translating consumer behavioral patterns into a useful context for marketing



#### Kchain

A leading global professional blockchain services company, providing a broad range of services and solutions in strategy, consultation, digital technology, and operations



#### RapidCube

A next generation, disruptive technology solutions provider leveraging blockchain, IoT, big data, and cognitive technologies, helping organizations across industries in adapting to the digital shift

## APPSOLUTELY

### Appsolutely

Helps businesses improve their ties with customers by setting digital strategies and creating rewards programs, websites, and apps that make customer loyal, engaged, and valuable



#### GoBlock

A leading blockchain consulting and software development boutique providing an engine that allows organizations to implement blockchain solutions on a 'plug and play' basis



#### Isarq

Optimizes computer processing, bandwidth, and hardware resources with the use of innovative technologies and blockchain technology



#### Origins

A platform that enables transparent sourcing and authentication of raw materials in global supply chains

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@ourNEM



**TWITTER**

@NEMofficial



**REDDIT**

/r/nem



**INSTAGRAM**

@nem.io



**MEDIUM**

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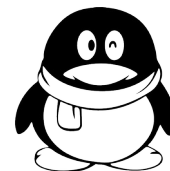
**YOUTUBE**

/c/NEMofficial



**WECHAT**

nemxem



**QQ**

121037425

# Join the Conversation



**nem**



**@nemred**

For topics  
related to NEM



**nem**



**@nemberia**

For general and  
price talks



**nem**



**@nemhelpdesk**

For tech support  
and queries

See more: <http://bit.ly/nem-telegram-channels>



# THANK YOU!

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