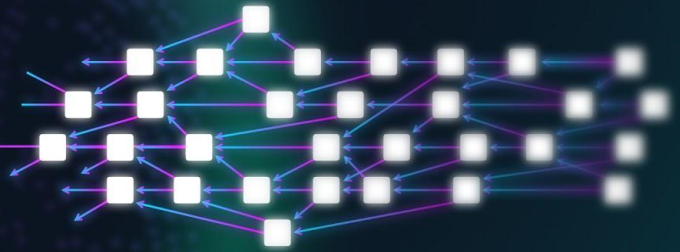
BEYOND THE BLOCKCHAIN



IOTA

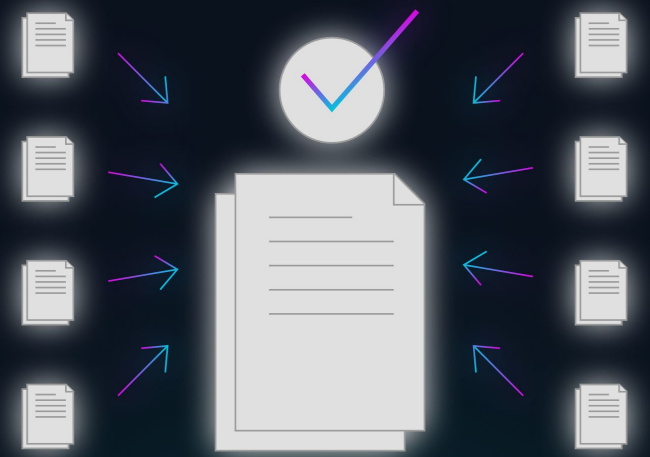
THIS IS
2018

ECONOMY OF THINGS

AUTONOMOUS
ECONOMIC AGENTS

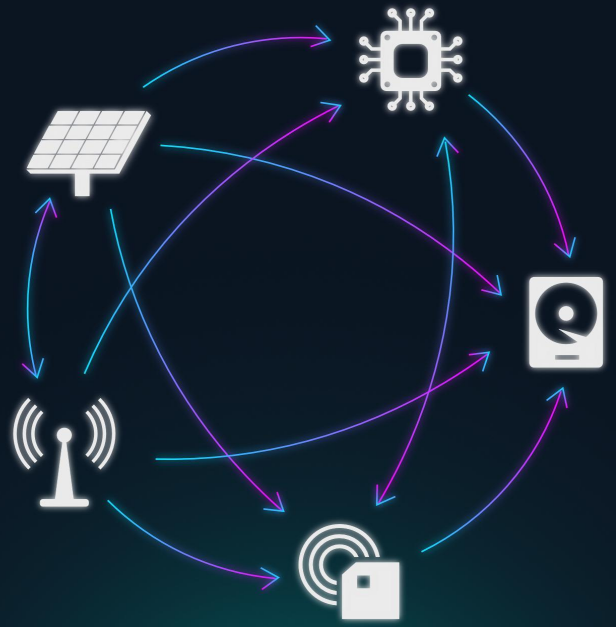
Machine-to-Machine Payments

Today there is no protocol for machines to pay each other. With distributed ledgers, every machine will be able to have a wallet and they can freely transact with each other.



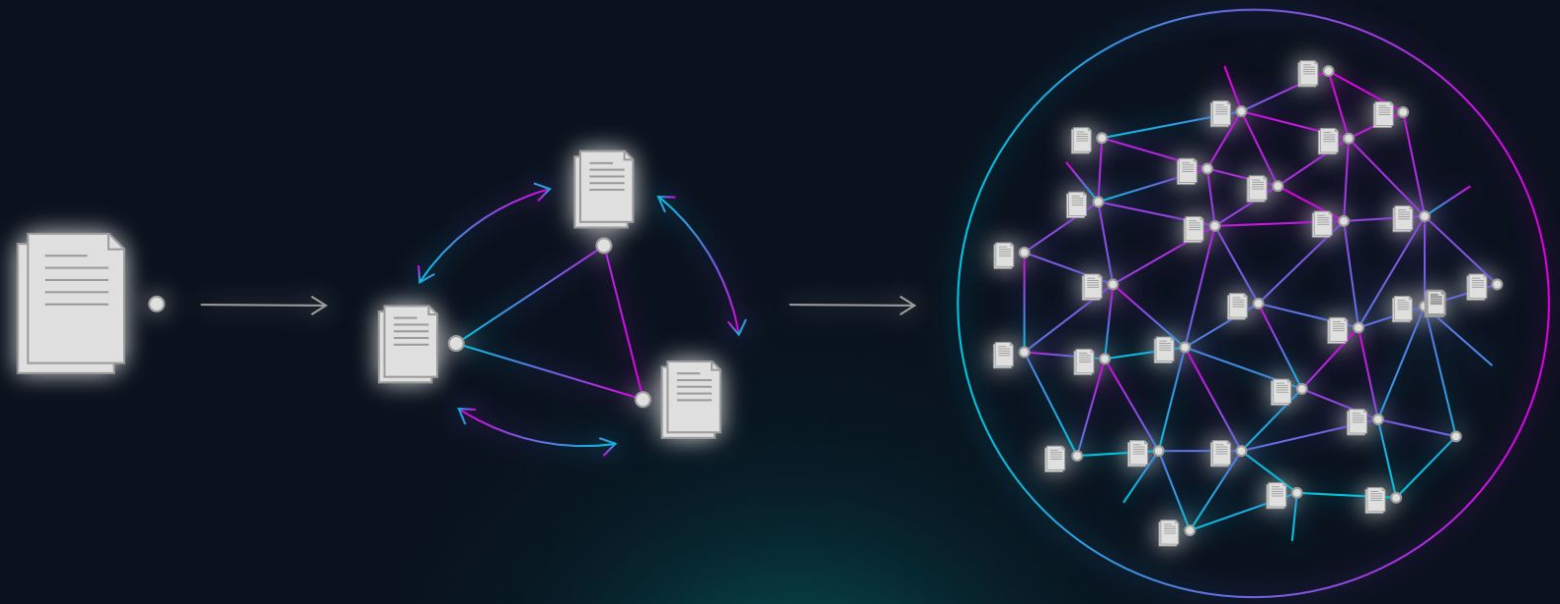
Data Immutability

Feeding data into a distributed ledgers makes it immutable and tamper-proof. Thanks to this data integrity, it is easy to share data with external parties in a verifiable manner.



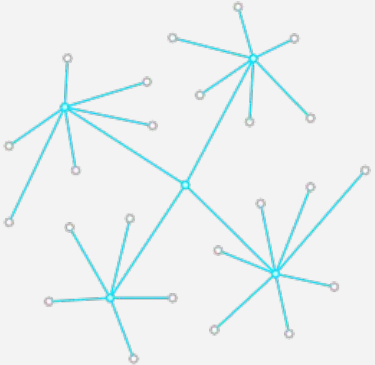
Permissionless Ecosystems are the Future

What are Distributed Ledgers?



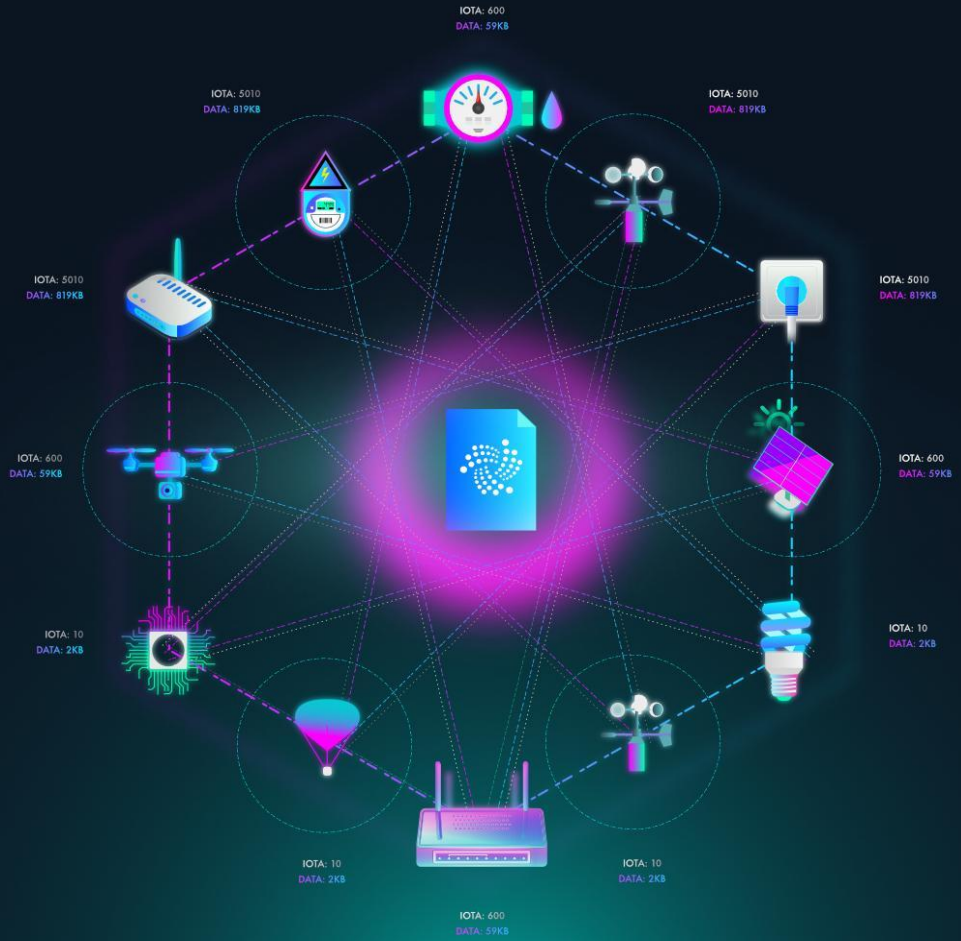
Networks

Centralized



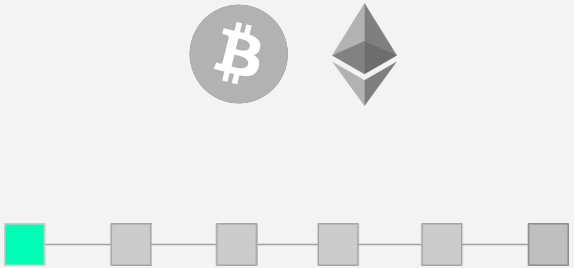
Decentralized
With Intermediaries

Distributed
No Intermediaries

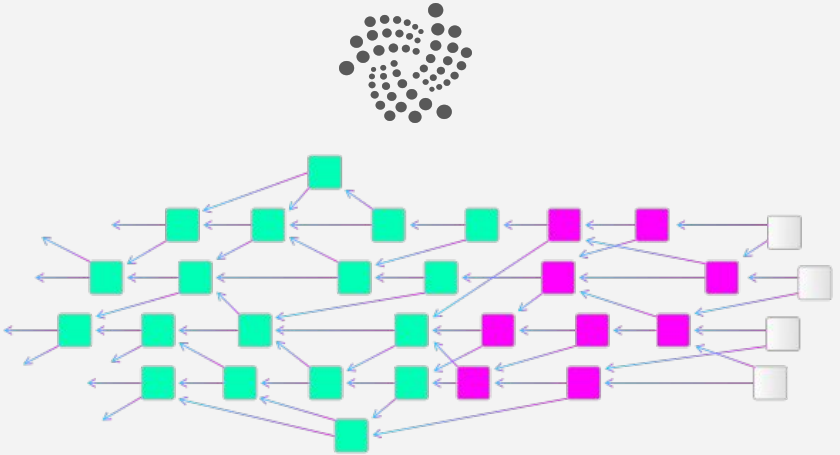

IOTA: 600
DATA: 59KB
IOTA: 5010
DATA: 819KB
IOTA: 5010
DATA: 819KB
IOTA: 5010
DATA: 819KB
IOTA: 5010
DATA: 819KB
IOTA: 600
DATA: 59KB
IOTA: 600
DATA: 59KB
IOTA: 10
DATA: 2KB
IOTA: 10
DATA: 2KB
IOTA: 10
DATA: 2KB
IOTA: 10
DATA: 2KB
IOTA: 600
DATA: 59KB

IOTA

Blockchain vs. Tangle



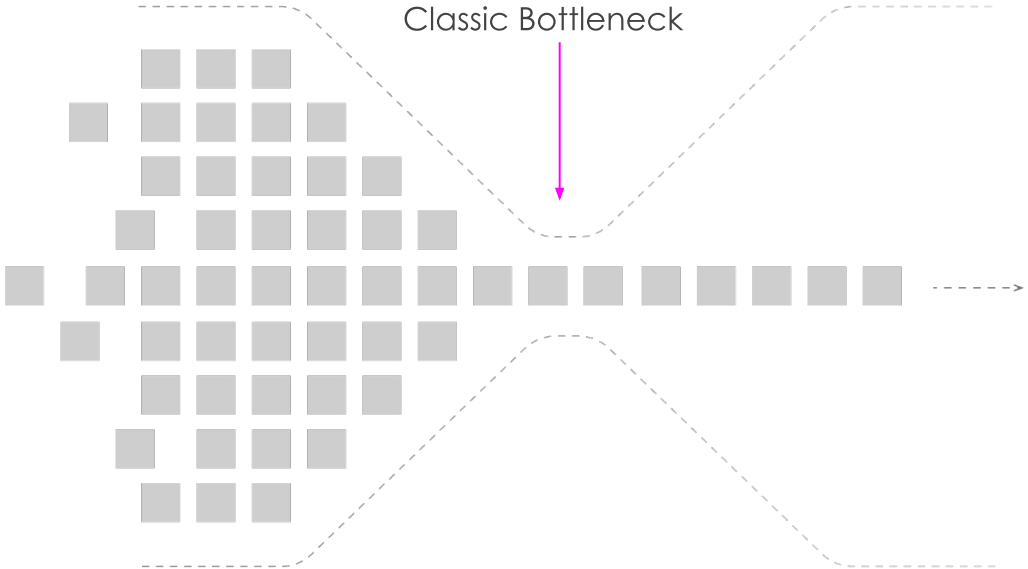
Blockchain



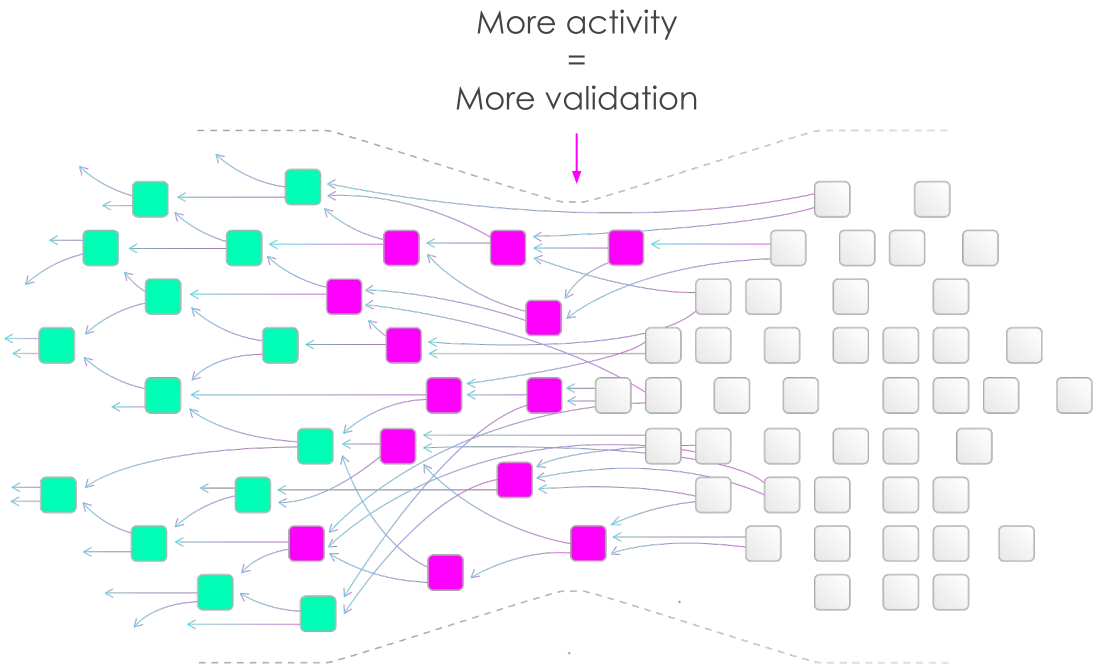
Tangle
(DAG / Directed Acyclic Graph)

The Blockchain Bottleneck

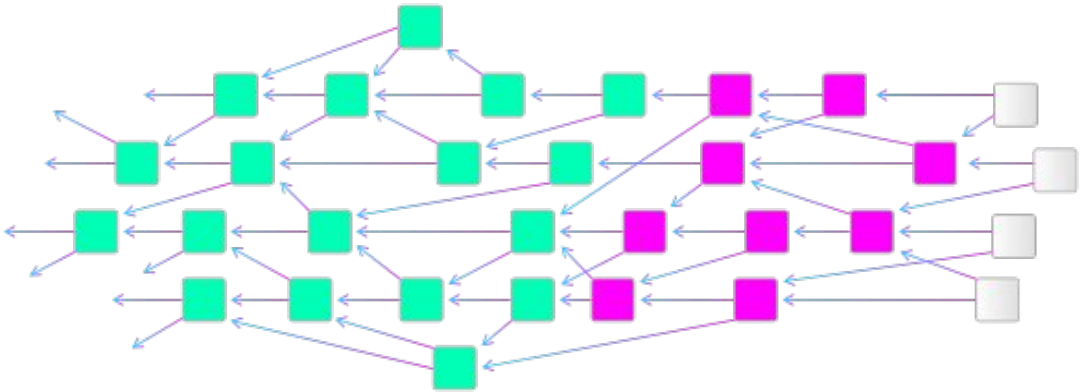
Blockchain Bottleneck



Tangle scales!



Consensus in IOTA



Each transaction validates at least 2 other transactions

- Chosen by Markov Chain Monte Carlo Random Walk algorithm

Signed with private key

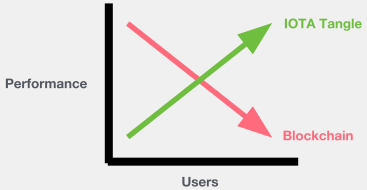
Small amount of Proof of Work

- Similar to Hashcash, not Bitcoin
- Spam and Sybil-resistance

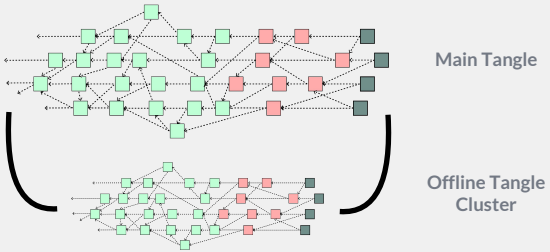
Tangle vs. Blockchain

No Transaction Fees

Scalability



Offline Transactions (Partitioning)



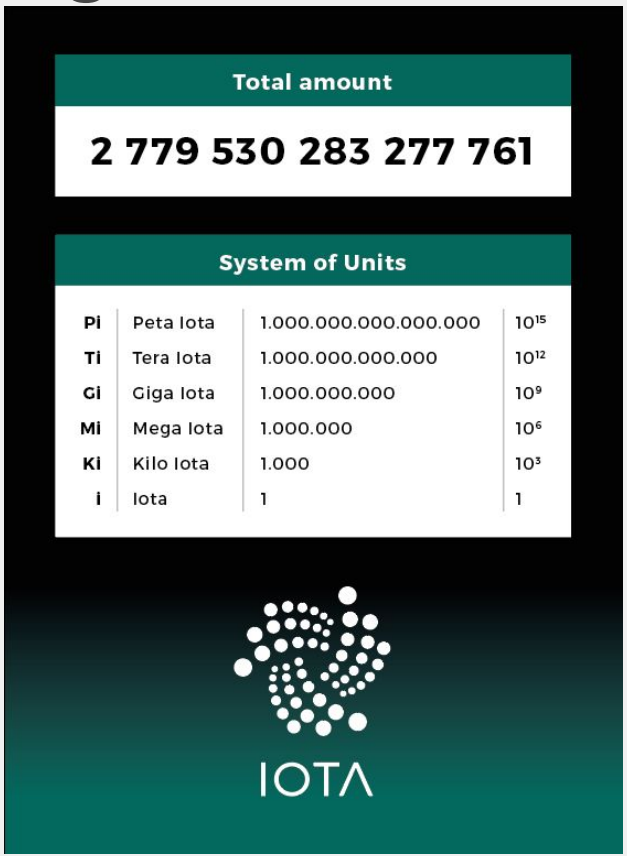
Other Benefits:

- No Miners
- Quantum immune

Disadvantages:

- Need a large enough network to be self-sustainable

Tangle vs. Blockchain



Other Comparison:

BTC has:
2,100,000,000,000,000 Satoshi

The IOTA Tangle today has
2,779,530,283,277,761 IOTA

So almost 3 Quadrillion IOTAs and only a difference of roughly **680** trillion units

A word of caution:

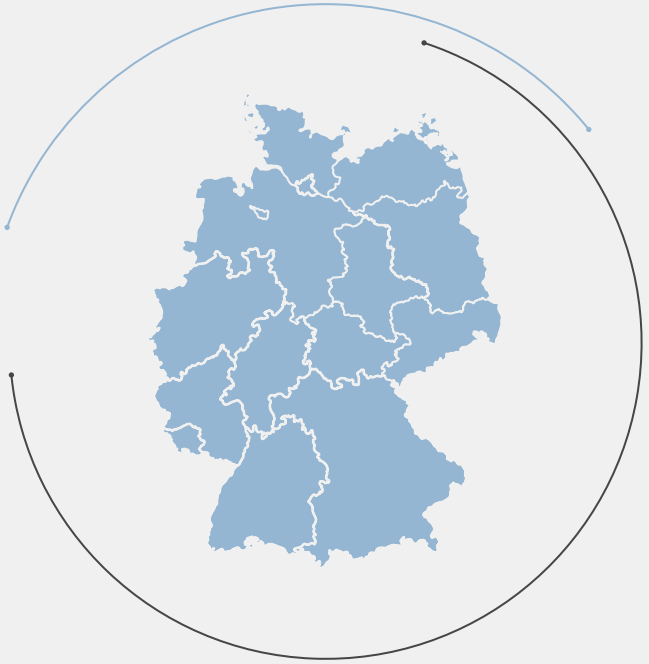
Exchanges work with **MIOTA**s don't let people scam you!

Who and What

IOTA Foundation

// gemeinnützige Stiftung

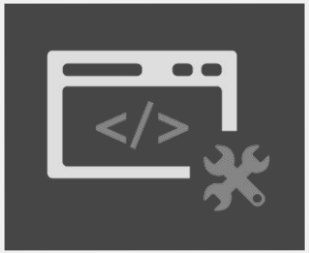
IOTA is run by a non-profit Foundation registered and headquartered in Berlin with the purpose of **developing** and **standardizing** new DLT technologies.



Research

Exploring the unknown

Going beyond IOTA and developing solutions for the Machine Economy requires the brightest minds to work together and research new solutions.



Development

Cutting edge technology

Development of production-ready software will make it possible for the Foundation's members to easily adopt and integrate the developed solutions.

Education & Promotion

Show your Competence

Educating members and non-members through seminars, educational materials and even larger events will ensure the Foundation's success in achieving its goals.

Standardization

Of Core Protocols

Interoperability requires standardization. A major effort of the IOTA Foundation will be to standardize the core protocols that we're developing.

Use Cases & Industries

Cooperation

Bosch

Bosch XDK110 and
Masked Authentication Messaging

IOTA MAM can run on Bosch XDK (32-bit cortex)

Secure sensor data transmission to the Cloud via IOTA

Micropayments to the Cloud

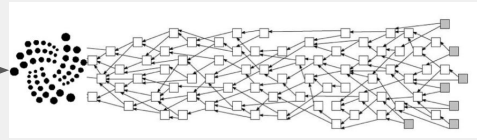
Proof of Concept funzionante – Trasferimento dati da sensore a DLT IOTΛ/Tangle via MAM

Bosch XDK

Broker

MQTTtoMAM

IOTΛ/Tangle



Sensore Bosch XDK per raccolta dati:

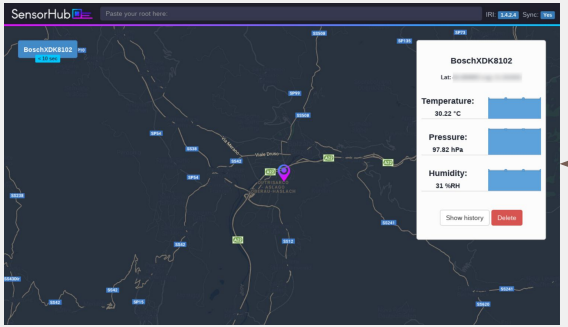
- ID
- Temperatura
- Umidità
- Pressione

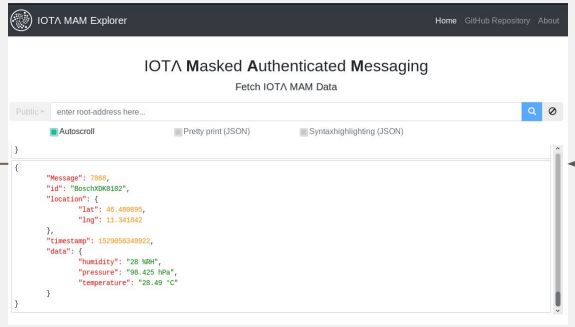
Trasmissione dei dati in formato JSON via mqtt al broker sul server

NodeJS sul server per invio dei dati su ledger distribuito IOTA/Tangle via MAM

Trasmissione crittografata dei dati su nodi distribuiti del Tangle via MAM (Masked Authenticated Messaging)

Esclusivamente gli enti con la **RootKey** adeguata hanno la possibilità di vedere/raccogliere i dati





Fujitsu

Fujitsu with IOTA at
Hannover Messe 2018

Industry 4.0

Smart Factories of the future & AI

Smarte Mobily and Co-creation

Volkswagen

VOLKSWAGEN - PROOF OF CONCEPT

FIRMWARE / SOFTWARE UPDATE OVER THE AIR

IOTA

By 2020 industry experts expect more than 250 million connected vehicles on the road. The need to perform frequent remote software updates of car components increases with the level of automation – especially with autonomous cars. IOTA envisions becoming the underlying protocol for car makers and suppliers to ensure secure updates and transparent access to audit trails.

THE CHALLENGES TODAY

Centralized ownership of data makes it difficult to ensure that the data are not tampered with. This lack of transparency leads to limited trust between parties and extensive documentation processes. Multipartner ecosystems create an intransparent audit trail and proof of untampered data can't be ensured easily.

THE PROJECT GOALS

1. Documentation of over the air update (OTA) process steps on an immutable data storage medium and audit trail, where data integrity can be ensured.
2. Integration of IOTA technology into the existing legacy system to prove interoperability and production readiness.

CORE BENEFITS FOR VOLKSWAGEN

- Establish transparency and digital trust with customers, authorities and third parties.
- Ability to provide an evidence to external parties.
- Handle product recalls efficiently.
- Ability to record high volume of (incremental) updates and different software versions
- Tamper proof & transparent statistical recording

MORE OPPORTUNITIES

- **On Demand Features:** Request and configure car related features
- **V2V and V2I Communications:** Exchange information, data and resources
- **Ecosystem:** Use secure and immutable data to customize services like usaged based insurance

Johann Jungwirth, Chief Digital Officer of Volkswagen and member of the Supervisory Board of the IOTA Foundation:

"Distributed Ledger Technologies (DLT) are crucial for the future of trusted transactions. IOTA has great potential to become a DLT leader with the Tangle approach."

VOLKSWAGEN

The Volkswagen Group is one of the world's leading automotive manufacturers. The Group maintains 120 production facilities in 31 countries, where it produces vehicles for customers in more than 150 countries. In 2017, the Volkswagen group delivered 10,741 million vehicles.

The IOTA Foundation was established in Germany as a formal, non-profit organisation ('gemeinnützige Stiftung') in 2017.
To learn more about IOTA visit **iota.org** or reach out to **contact@iota.org**.

Documentation of OTA Firmware updates

Integration of IOTA into legacy system

Transparency and trust with authorities and 3rd parties

Volkswagen

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Other Cooperation

Outlier Ventures	Investor
Volkswagen	Automobile Company
Innogy	Energy Company
F6S	Online Tech Startup Incubator
Luxoft	International Software Development Company
St. Petersburg Polytechnic	University
Ecologie.io	Environmental Protection Incentivization Company
QUANTITEC	Indoor Navigation Localization Company

RuuviTag Founders	OpenSource Bluetooth Sensor
Cleantech21 Foundation	Climate Change
The Government of Thailand	Government Sponsored Event
Evernym	Online Identity
Paragon	Decentralized Marijuana Token
BitDice	Online Casino
REFUNITE	Assists Refugees Find Family Members
Imperial College London's Centre for Cryptocurrency Research and Engineering	IC3RE

Other Cooperation (Medical)

Olso Medtech
The Norwegian Centre for E-Health Research
Oslo Cancer Cluster
Alpha Venturi

Other Cooperation (IoT Alliance)

BNY Mellon	Banking Services
Cisco	Telecommunications
Gemalto	Digital Security
U.S. Bank	Banking Services
Bitse	Blockchain as a Service Company
Chronicled	Creates Block Chain Ledgers for Physical Things
ConsenSys	Block Chain Consulting Company
Skuchain	Cryptography Entrepreneurs
Slock.it	Implements IoT Tracking for Business

HCM International of Foxconn Group	Technology Company
Oaken Innovations	Self Proclaimed: Crossroads of Blockchain and IoT
Qtum	Merges Bitcoin and Ethereum Tech
Chain of Things	IoT Identity and Security
Big Chain DB	Scalable Blockchain Database Powering IPDB

Other Cooperation (IoT Alliance)

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Latest Cooperation

DNB is Norway's largest financial services group and one of the largest in the Nordic region in terms of market capitalisation.

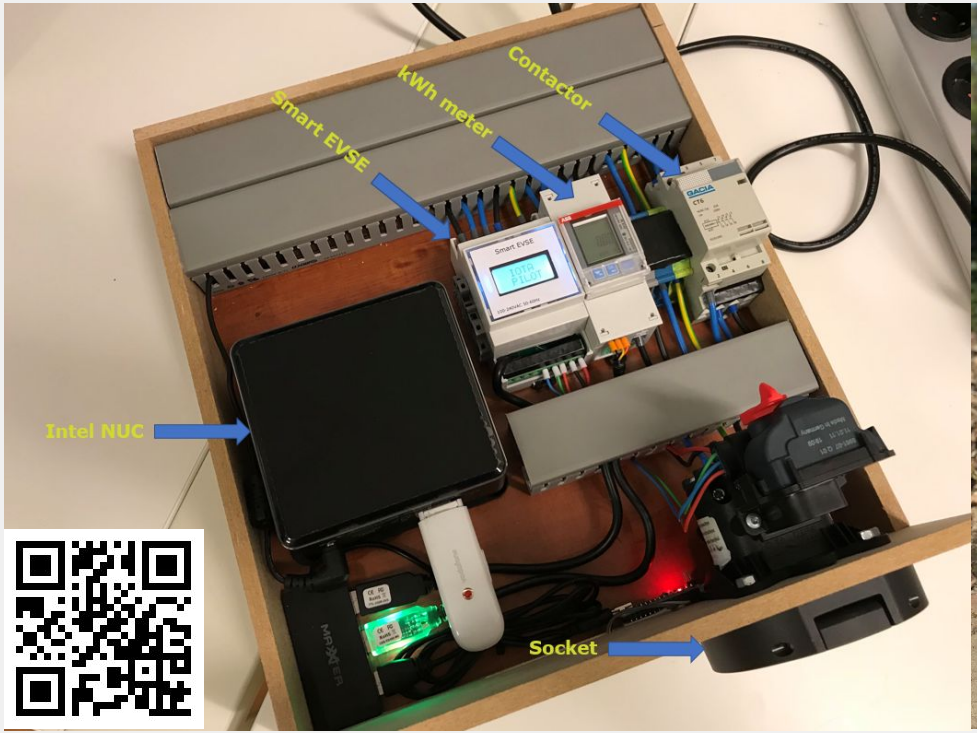
The Economy of Things and MyData / ‘GDPR as an opportunity’

IOTA

What is going on

ENEXIS

Elaadnl

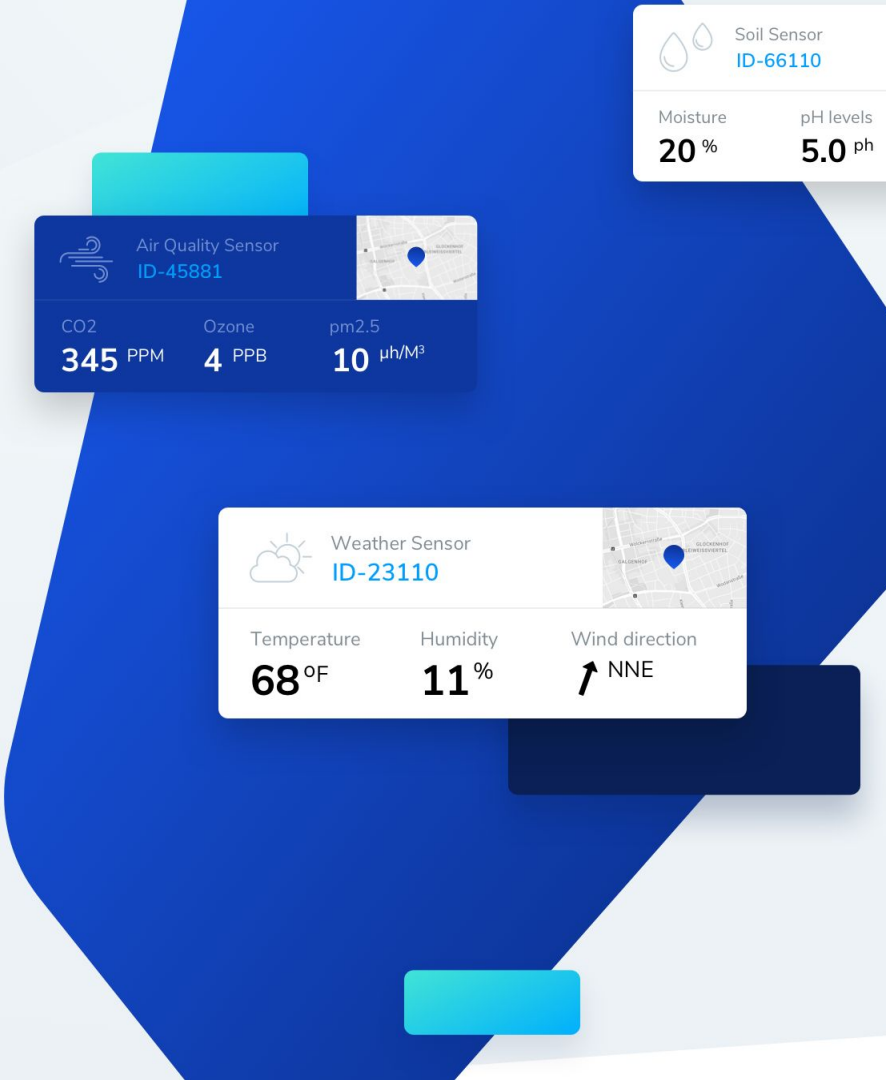


IOTA

IOTA makes it possible to securely store, sell, and access data streams.

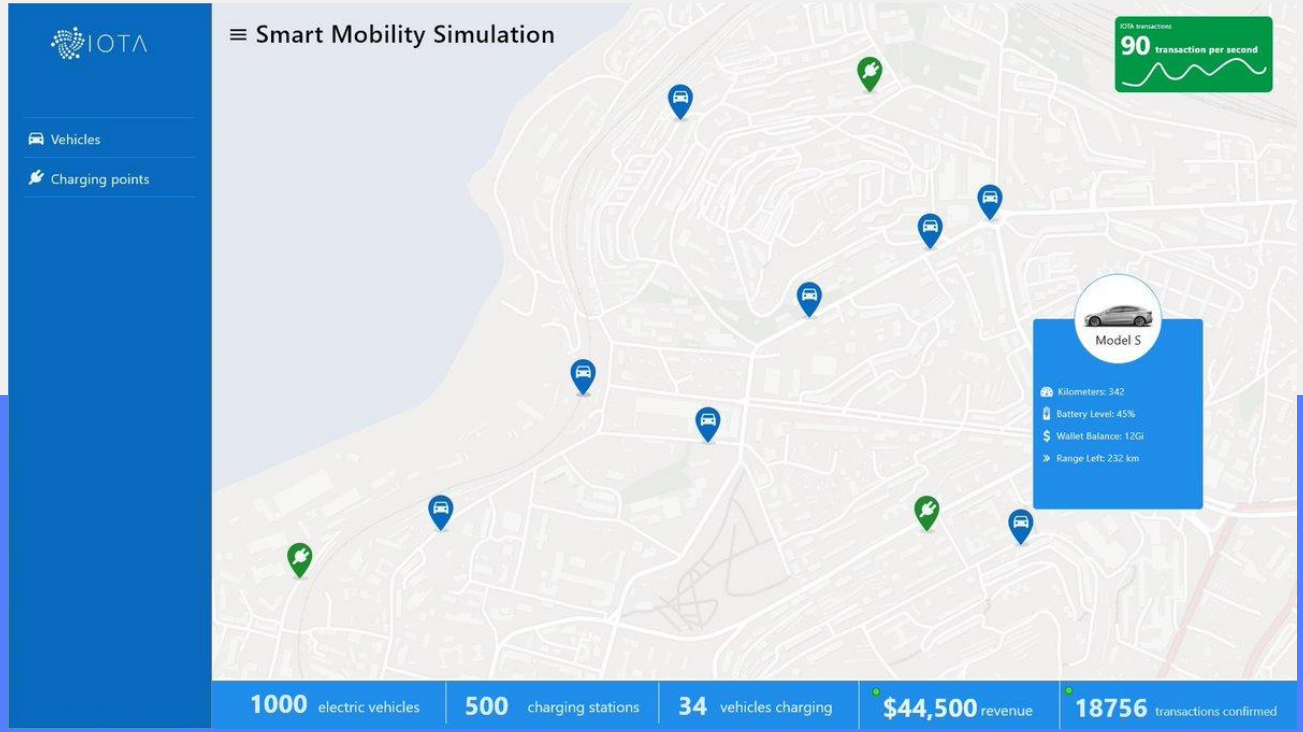
Never has getting access to diverse, fine-granular data been this easy!

TRY IT YOURSELF



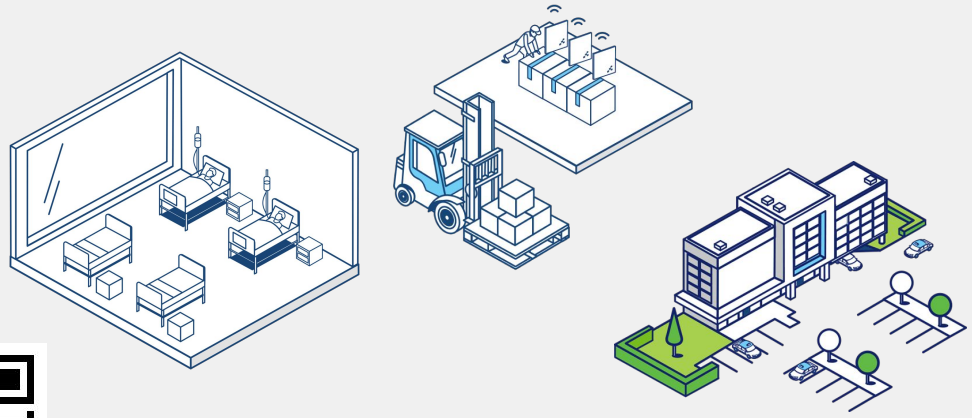
IOTA FOUNDATION

Smart Mobility Simulations



Kontakt.io

kontakt.io



Bluetooth Beacons

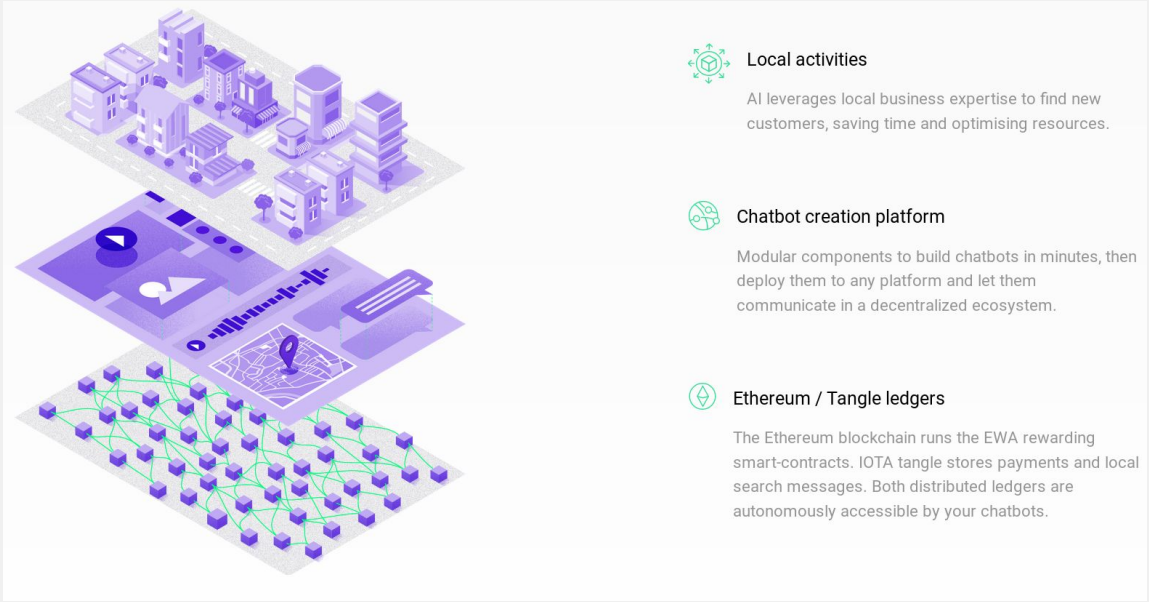
Location Managers

Healthcare

Supply Chain

Public Spaces

Localflow



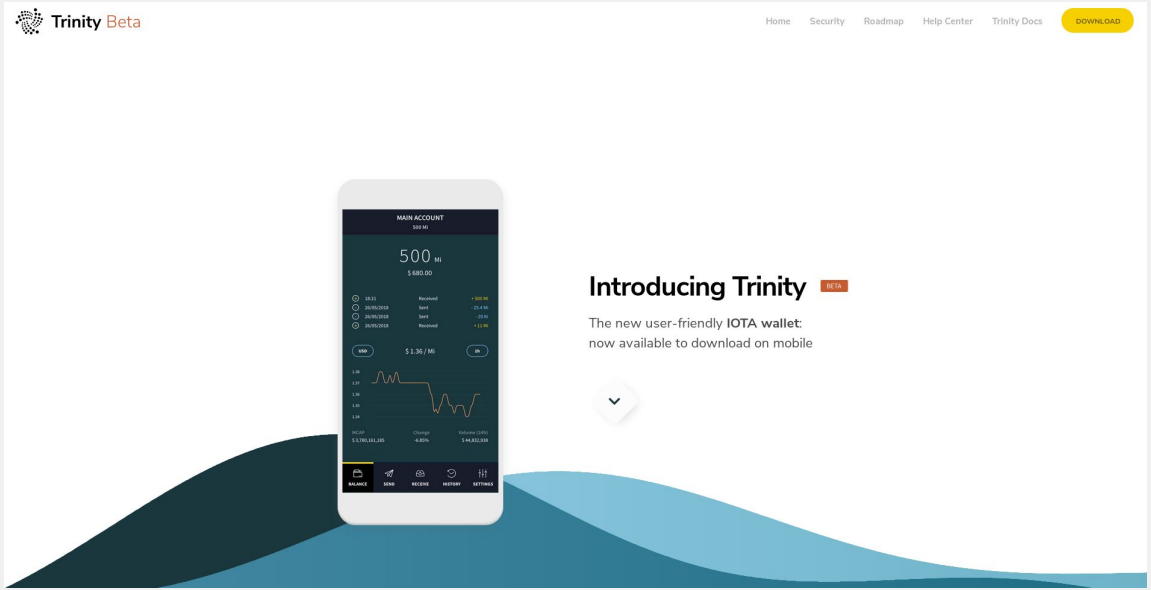
The AI chatbot platform for local economy

Easy-to-use local social network

Fintech infrastructure for local microservices

Taking away any middleman from traditional search engines, sharing economy platforms and payment methods

Trinity



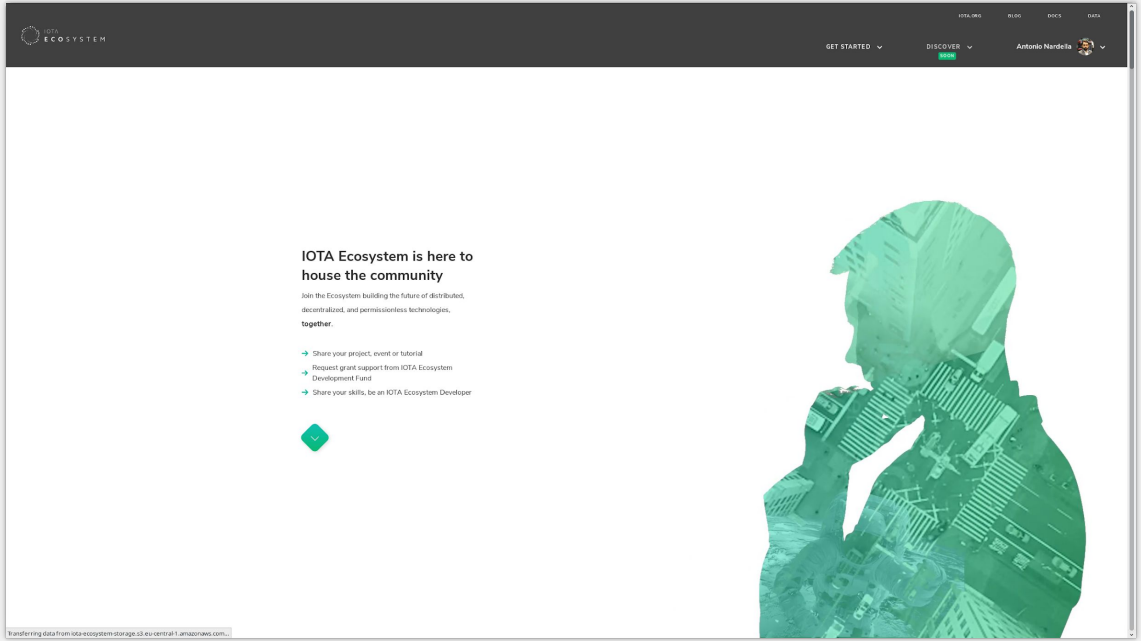
User friendly wallet

Android

iOS

Windows/MacOS/Linux soon™

Ecosystem



Tutorials

Projects

Events

Developers

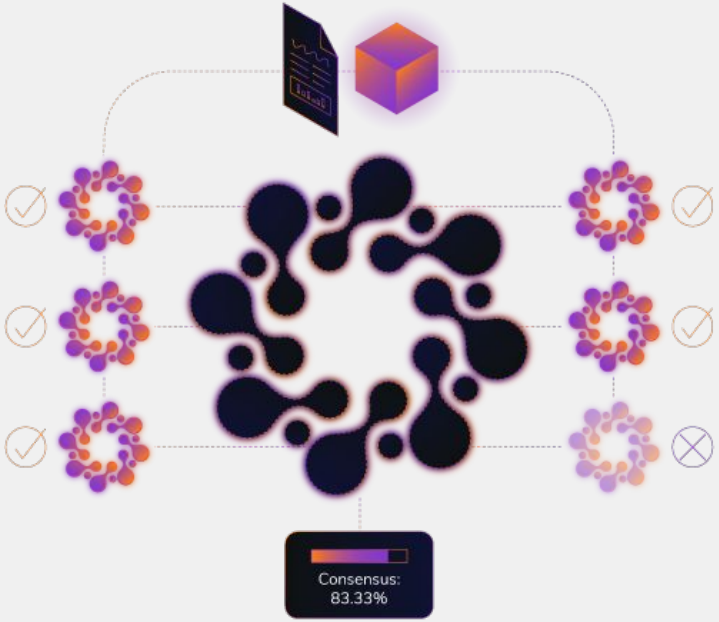
The IOTA Ecosystem Development Fund

Official IOTA Ecosystem

21.69 TI

$ 26.507.662

Qubic



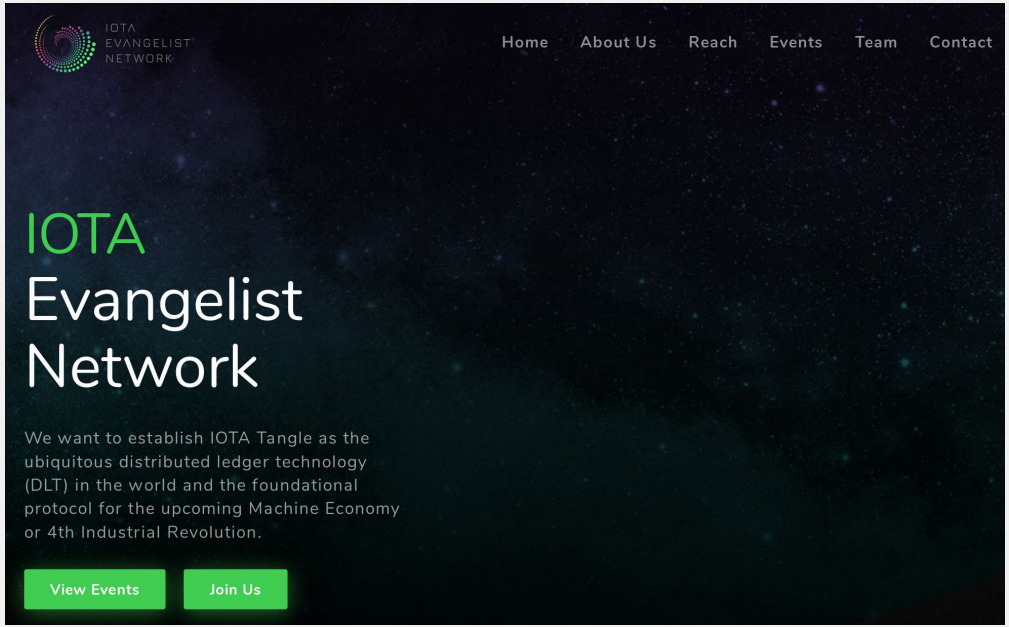
Quorum Based Computing

Oracles

Smart Contracts

Distributed Computing

IOTA Evangelist Network



A world-wide strong community of IOTA enthusiasts.

Content Creating

IOTA Demo

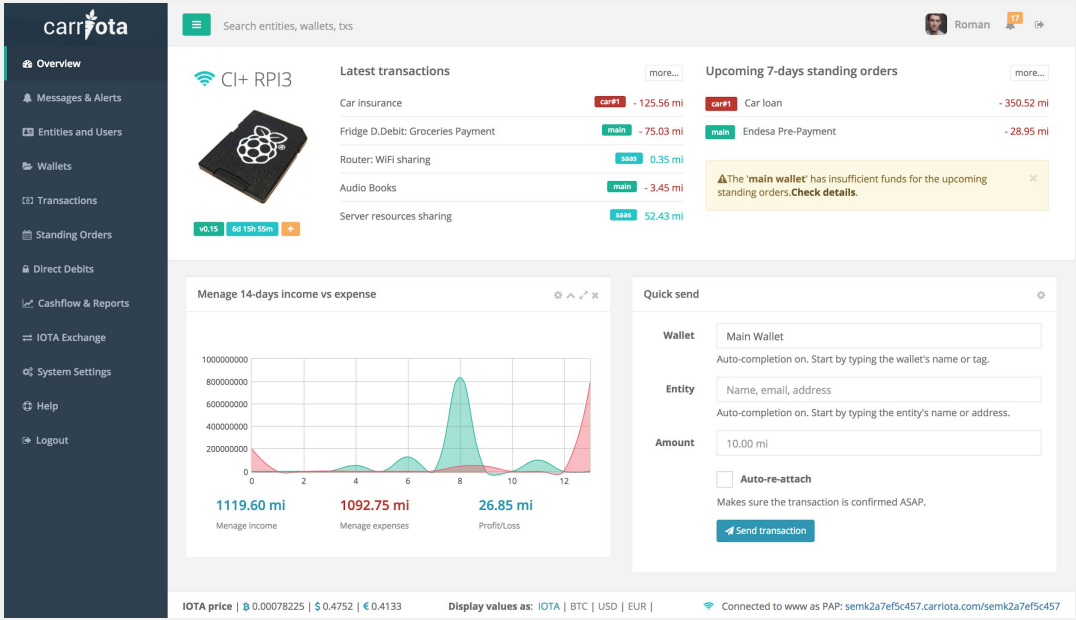
IOTA PoCs

108 members so far

IOTA

Projects

CarrIOTA



IOTA Finance Manager

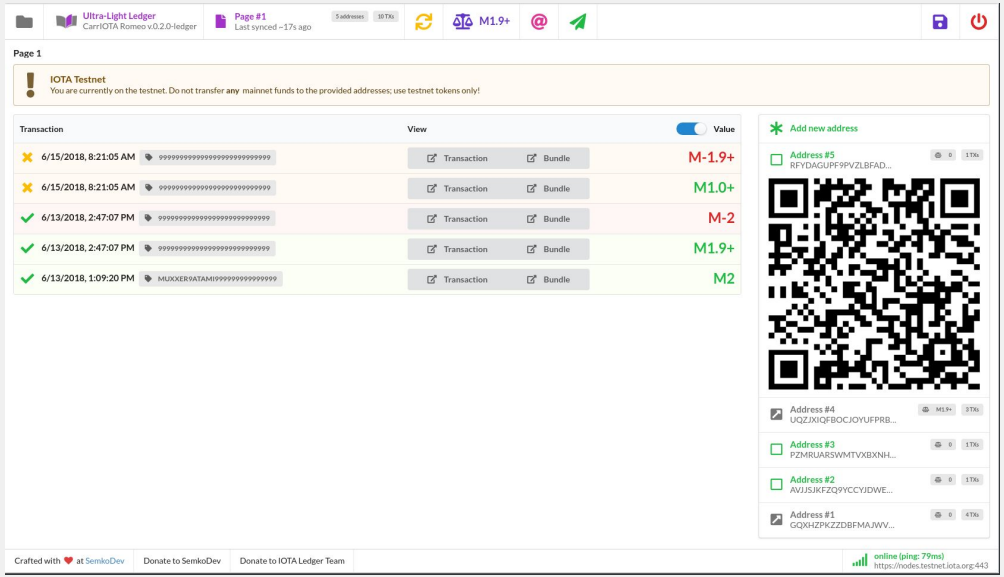
Nelson:
Automatic peer discovery

Field:
Distributed node field with donations

Romeo:
Wallet

Hercules:
IRI node in GO(lang) for SoC (Raspberry Pi Zero, Beaglebone)

CarrIOTA Romeo



Browser Wallet

A wallet in a browser

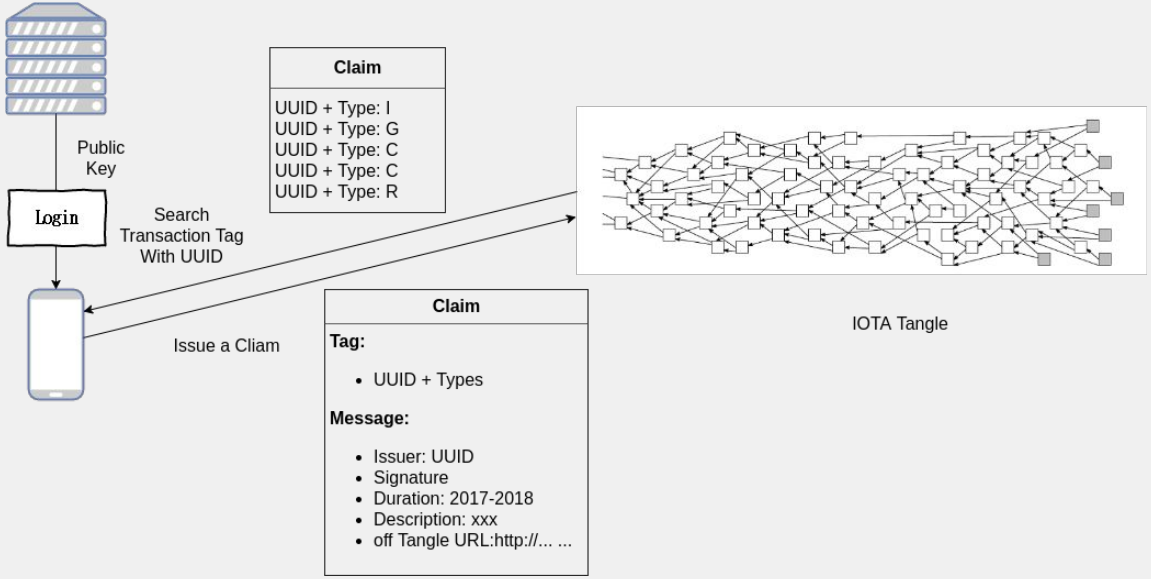
Lightweight

First to support Ledger Nano S Hardware wallet thanks to the **IOTA Ledger Team**

Live demo after the presentation

BEWARE: STILL ALPHA SOFTWARE

TangleID - BiiLabs - Taipei - Taiwan



TangleID is a secure, easy-to-use system for self-sovereign identity, built on IOTA/Tangle

Identity cryptographically linked to offline data stores storing the hash of data blob (Google Cloud, Azure, AWS, Dropbox..), where data is stored

Identities update themselves

Can grant others temporary permission to read or write specific files

TangleID identities can control digital bearer assets such as cryptocurrencies or other tokenized assets

Let’s innovate with

Contacts:

IOTA

progetti@antonionardella.it
https://antonionardella.it
https://twitter.com/antonionardella
https://www.linkedin/in/antonio-nardella-bz

Links

IOTA

IOTA Blog

Qubic

Ecosystem

IEN

Trinity Wallet

Marketplace

Fujitsu Hannover

Bosch XDK

Kontakt.io

Elaad

TangleID

AN - Qubic (IT)

LocalFlow

AN - Bosch XDK

Developer Videos

SemkoDev