



## About Orbs

Orbs is a hybrid blockchain that scales base-layer protocols. It is the first customizable public blockchain designed to provide flexibility for the ever-evolving needs of real businesses. With built-in interoperability, Orbs serves as a “middleware” solution for dApps with millions of users looking for a sustainable stacking solution. Our *Ethereum Interoperability* architecture strategy allows dApps to enjoy the best of two chains: uncompromising security, liquidity and ecosystem integration, production-ready scalability, suitable fee structures, business model flexibility and speed that does not compromise on security. This combination of Ethereum and Orbs is the optimal hybrid solution for apps looking to adopt blockchain, today. Orbs is one of four companies named by Gartner as a “Cool Vendor in Blockchain Technology” in 2018.

## Designed for Real Business.

Orbs is built by developers, for developers, with real business needs in mind. Design strategy is driven by:

### Efficiency

Orbs’ requirement-driven architecture is guided by our “Don’t Reinvent - Partner or Innovate” approach. This is the driving force behind the hybrid model: **interoperability with base-layer blockchains**. Led by our *Ethereum Interoperability* strategy, adopting Orbs alongside Ethereum is the optimal solution for real businesses looking to adopt blockchain, today.

### Flexibility

Orbs enables **customizable dApp hosting**. Infrastructure providers should enable—not limit—app design. The innovative architecture of **virtual chains** provide the benefits of a dedicated blockchain while running on top of a shared network, thus enjoying the same security and decentralization provided by the shared environment.

### Sustainability

Designing decentralized ecosystems requires a strong economic base alongside technological innovation. Governance must provide checks and balances, as well as incentivization models, that sustain prosperity for all actors and stakeholders. Orbs’ Helix RPoS is designed by expert developers, economists and political scientists to align interests in an evolving system.

## Building a New Scaling Standard.

Scaling dApps does not end with speed, and infinite TPS (transactions per second) is futile without providing a comprehensive solution for the needs of real businesses. Orbs is building a new global standard of comprehensive scalability:

### Speed

The combination of Intelligent Sharding and RPoS block creation consensus provides the TPS requirements of commercial-grade dApps without compromising security and decentralization. Moreover, Orbs’ virtual chains facilitate a dedicated hosting environment where dApps are not affected by traffic elsewhere in the network.

### Fees

Real businesses require *predictable* fee models that are competitive with centralized providers. Current blockchain infrastructure solutions exemplify the *diseconomy of scale* where transaction costs go up with usage. This doesn't work in the real world. Orbs introduces a monthly subscription model similar to that of cloud service providers like AWS.

### Business Models

Infrastructure services should accommodate varying business models, not dictate them. An absence of flexibility restricts dApp design. For example, base-layer blockchains require users to pay transaction fees, hindering user adoption (tantamount to cloud servers deciding how, when, and in what currency users should pay for app services). Orbs leaves these decisions up to developers.



## The Hybrid Model - Interoperability powered by two chains.

Base-layer blockchains that have organically developed a liquidity ecosystem are a superior solution for token-issuance. dApps prefer an already accepted token-standard, and we prefer not to invest resources into an artificial liquidity ecosystem. Thus, guided by our “Don’t Reinvent - Partner or Innovate” design strategy, Orbs is built as a scaling blockchain alongside base-layers protocols.

### *Ethereum Interoperability First: bringing business-grade scale to Ethereum.*

Ethereum has become the de facto standard for token issuing. It has an unmatched combination of decentralization, liquidity and ecosystem. However, it comes with high and unpredictable gas fees, low TPS capacity with inflexible business models which hinder apps from onboarding users. Thus, an ethereum token requires an overlay network optimized for microtransactions in order to perform high-scale, low-fee operations. Rather than replacing Ethereum, Orbs comes to leverage and complement it. The two platforms are specifically designed and optimized for fundamentally different use cases, making them a powerful and efficient hybrid. Orbs will therefore act as middleware Blockchain between Ethereum and dApps.

### How does it work? Autonomous Atomic Swaps

Autonomous Atomic Swaps are the most efficient and pragmatic strategy on the market for advanced cross-chain conversions. They also allow dApps to keep their base-layer (ERC20) token standard.

- The practical use of atomic swaps for protocols is to allow the transition of different tokens between networks. In the context of transferring tokens between blockchains, the asset usually doesn't change hands but is frozen and released according to the agreed upon contract.
- Native solutions use a custodian that holds both tokens and conducts the swaps among clients. This however, relies on a centralized entity and may be subject to rates.
- Orbs’ autonomous atomic swaps automate this process, which relieves the network of relying on a third-party to monitor the transactions and making sure duplication did not occur.

Tokens are first anchored on Ethereum. A smart contract on Orbs reads the anchoring and automatically releases the relay token on Orbs, and sends the proof of release to the lock on Ethereum that will complete the action. The smart-contracts assure there is always a 1:1 swap ratio to avoid double-spending.

### Middleware blockchain vs. L2

Layer 2 solutions rely on a layer-1 blockchain for security. Layer 2 can be off-chain solutions, or side-chain mechanisms that require similar maintenance to private blockchains. This can be an effective solution for a number of use cases. Orbs, however, is built for different clients. Orbs serves as a middleware solution between base-protocols and dApps, providing public, on-chain transaction processing at low maintenance while providing the flexibility of a dedicated network.

**Flexibility:** Orbs will accommodate L2 features for dApps to apply on their virtual chain if they chose to.

**Efficiency:** Delegation of computations to base-layer blockchains will be conducted where it is cost-effective, such as Distributed Key Generation over Ethereum.



## Virtual Chains - Customized blockchain solution for real-business needs.

### Virtual Chain technology on Orbs provide horizontal scalability, insulation security and customized hosting in a shared resource environment.

Orbs is the **first customizable public blockchain** allowing flexibility for the ever-evolving needs of real businesses. In addition to business-grade speed, Virtual Chains provide the benefits of a dedicated blockchain while running on top of a shared physical infrastructure, thus enjoying security and decentralization provided by the shared environment.

In the Orbs architecture, Virtual Chains serve three primary features: Intelligent Sharding for speed, Insulation for Security and Customization for flexibility.

#### Speed - Intelligent Sharding

Intelligent sharding and isolation allow for enhanced traffic or viral dApps to run without impacting the network traffic.

#### Security - Isolation

On Orbs, security problems will be contained per virtual chain. Each dApp remains isolated from any hazards that impact another dApp on the network.

#### Flexibility - Customized Blockchain

- Different apps have different needs, and these are ever evolving. dApp infrastructure requirements today will differ from their needs in 2-3 years. Changing infrastructures when requirements evolve, especially with a token, is inefficient at best.
- While enjoying the benefits of independent virtual chains, apps still have the decentralization and security of the Orbs common infrastructure, without the need to maintain their own chain.
- Orbs allows each dApp the autonomy to determine some parameters of the virtual chain it is running on, and for its governance to be separate from that of the entire network. Each dApp can customize its governance model, elastic resource capacity like dedicated storage needs, compliance features and security requirements.
- The Orbs virtual Chains Plug & Play includes flexibility on Consensus, smart-contract coding language, base-layer connectivity features and a choice of base-layer. Developers simply need to choose which features work for them.
- Blockchain Virtualization allows for autonomous governance for each dApp. For example, while other protocols require the approval of the base-layer governance for unforeseen changes in an individual app's smart contracts, on Orbs such changes can be made on the virtual chain without the consent of the entire network or equivalent mechanism.



## Orbs Scaling Standard: Achieving speed without compromising decentralization and security

Orbs developed groundbreaking technologies to scale: Virtual Chains and Randomized Proof of Stake

### Intelligent Sharding with Virtual Chains

**Virtual Chains are intelligent sharding. Unlike current sharding solutions that randomly split traffic, virtual chains optimize (lane) usage by allocating one per app.**

- Current sharding solutions are “simple” – the network’s users and resources randomly split into lanes in order to reduce traffic. However, users often transact with other users randomly placed in different lanes, which reduces sharding’s efficiency.
- Virtual chains are the “intelligent” version of sharding: users are grouped by their likelihood to transact with each other. Virtual Chains are individual lanes created for every application on the Orbs Network. Since users transact within applications, efficiency and speed are maintained.
- Virtual chains protect and insulate dApps from hazards elsewhere on the general network. For example, the DAO bug, which compromised the entire Ethereum network, would have only affected its application with the bug had it been run on Orbs. Moreover, if a bug were to occur, the governance decision on how to address it can be taken within the virtual chain, by its stakeholders.

### Randomized Proof-of-Stake (RPOS)

**The Orbs consensus allows for the security and decentralization benefits of 1,000 nodes while enjoying the speed and efficiency of 21 nodes.**

- How? Randomization for security. While the Orbs network could comprise of thousands of independent nodes, a randomized committee of a smaller number of nodes is generated to reach consensus for each block, making it mathematically impossible to know which nodes will be chosen.
- RPOS VS dPoS:
  - Basic Proof-of-Stake means those with more tokens win. This contradicts Orbs’ vision of creating a platform that puts the needs of app developers first. The Orbs RPOS ensures network performance and node trustworthiness, as well as stake.
- Our RPOS is comprised of 3 elements of merit:
  - Minimum Stake
  - Reputation: Other nodes vouching for trustworthiness
  - Compliance level: positive behavior of nodes (such as allocating committed resources, updating protocols, signed transactions, fairness etc).



## Partners:



A subsidiary of Kakao, Ground X is a blockchain technology and service firm developing a public blockchain platform for the Asian market. Based on its technologies and experience in implementing various global services (e.g., KAKAO), Ground X platform will provide an enterprise-friendly development environment, optimized computation speed and scalability, as well as UX / UI that is convenient for general users.



Terra is a price-stable cryptocurrency that will power the next-generation payment network and grow the real GDP of the blockchain economy. Terra will disrupt the everyday digital commerce through its Terra Alliance and connections to the e-commerce industry, with co-founder Daniel Shin, founder Korean e-commerce giant TMON, which has a market value of USD 4 billion.



The Zinc app allows users to customize which data they share with advertisers and get Zinc tokens as rewards. Zinc is powered by IronSource, an advertising technology powerhouse with a global reach of over 1.5 Billion monthly active users, 850 employees in over 10 countries and a SDK integrated into more than 70K applications.



PumaPay is a blockchain-based pull-payment protocol - a decentralized alternative to PayPal. Among its launch partnerships are businesses interacting with hundreds of millions of users and processing billions of dollars worth of payments, such as lifestyle media company FashionTV and adult media giant Vivid Entertainment.



The Endor.coin Protocol, offers the world's first automated, self-served, predictive platform. It allows business users to ask complex predictive questions and obtain high-quality results in minutes, aiming to democratize the field of Data Science, that today is reserved mostly for Fortune500 companies. Endor.coin is based on the novel science of Social Physics developed at MIT.



Built on Nasdaq's market-leading matching technology, DX.Exchange is the first crypto community that allows institutions and individuals to purchase cryptocurrencies with fiat, trade cryptocurrencies, & convert crypto back to fiat.



ATOMIC is a cross-blockchain infrastructure allowing for a dramatic improvement in transaction approval speed without exposing users to any custodian-risk. It's building the future protocol for decentralized exchanges, centralized exchanges, e-Commerce sites and point-of-sale solutions



## Team:



Daniel is the co-founder and CEO at PayKey, an Israeli Fintech startup with investors such as MasterCard and Santander InnoVentures. He is also a veteran member of the Israeli Bitcoin community and the first person in Israel to ICO a blockchain company. Daniel holds a LL.M and BS in Economics.



Uriel co-founded Visualead, a AR/VR startup acquired by Alibaba. He is a former team leader at Mellanox, a leading Israeli high-tech company. Uriel holds a BSc summa cum laude in Electrical Engineering from the Technion.



Tal co-founded Appixia, a mobile app startup acquired by Wix.com, and was Wix.com Head of Mobile Engineering. He is an expert in blockchain consumer applications, as Head of Engineering in Kin by Kik Interactive. Tal is an open source enthusiast, contributor to the React ecosystem and conference speaker. He holds BSc summa cum laude in Computer Engineering from the Technion and is a veteran of an elite section of the IDF 8200 unit.



