cosvm

Secure 360°
Cross-Communication
in a Unified Ecosystem

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INTRODUCTION

Project Overview

CosVM Network is a Decentralized, open-source, energy-efficient public blockchain with high speed and low transaction fees. CosVM is designed to support the creator economy with Web3 applications such as **DeFi** and **GameFi**, ultimately serving as the foundational infrastructure for an open metaverse. CosVM is designed to serve the next billion Web3 users and to help them experience the full promise of self-custody of their digital assets.

CosVM is an **Ethereum-Virtual Machine (EVM)** compatible blockchain powered by Ethermint and built with the **Cosmos SDK** that supports the Inter-Blockchain Communication **(IBC)** protocol. Accordingly, end-users can import cryptocurrencies from the Ethereum, **Cosmos** and other chain families into CosVM, and subsequently use, trade, or invest them in innovative smart contract-based protocols leveraging the rich application ecosystem of **Ethereum/Solidity,** and rapidly port apps & smart contracts from Ethereum and **EVM-**compatible chains.

CosVM is fast, cost-effective, and frictionless. CosVM aims for high transaction throughput **(from hundreds to thousands of transactions per second),** fast transaction finality **(5–6 seconds)**, and low transaction fees **(from one cent to a few dimes).** Its Proof of Authority **(POA)** consensus mechanism combines decentralization with streamlined, scalable, and environment-friendly transaction processing. CosVM can deliver cheaper transactions than Ethereum mainnet, making Decentralized applications **(dApps)** and smart contracts potentially more **affordable, carbon-neutral,** and more user-friendly.

Developers on CosVM can benefit from the support of CosVM Labs, a Web3 startup accelerator and ecosystem development fund. Builders and creators can tap into its **$100m EVM** fund.

CosVM Value Proposition

As an open-source **Layer 1** blockchain, CosVM aims to massively scale the Web3 user community by providing builders with the ability to instantly port apps and crypto assets from other blockchains while benefiting from low transaction fees, high throughput, and fast transaction finality. **Key value propositions of** CosVM **include:**

1: EVM Compatibility:

CosVM is built on Ethermint, which supports rapid porting of apps and smart contracts from Ethereum and other EVM-compatible chains;

2: Scalability:

CosVM aims to deliver faster, cheaper, and carbon-neutral transactions and smart contract execution than proof of work chains;

3: Interoperability:

The Inter Blockchain Communications (IBC) protocol enables interoperability and bridging to other IBC-enabled chains, such as Cosmos Hub, Osmosis, etc.

4: Proof of Authority (POA):

Utilizing POA as a more streamlined and scalable consensus mechanism while still maintaining security through a range of experienced and carefully-vetted validators;

5: Open Source:

High involvement of the community is welcomed to proactively review and provide suggestions to strengthen CosVM.
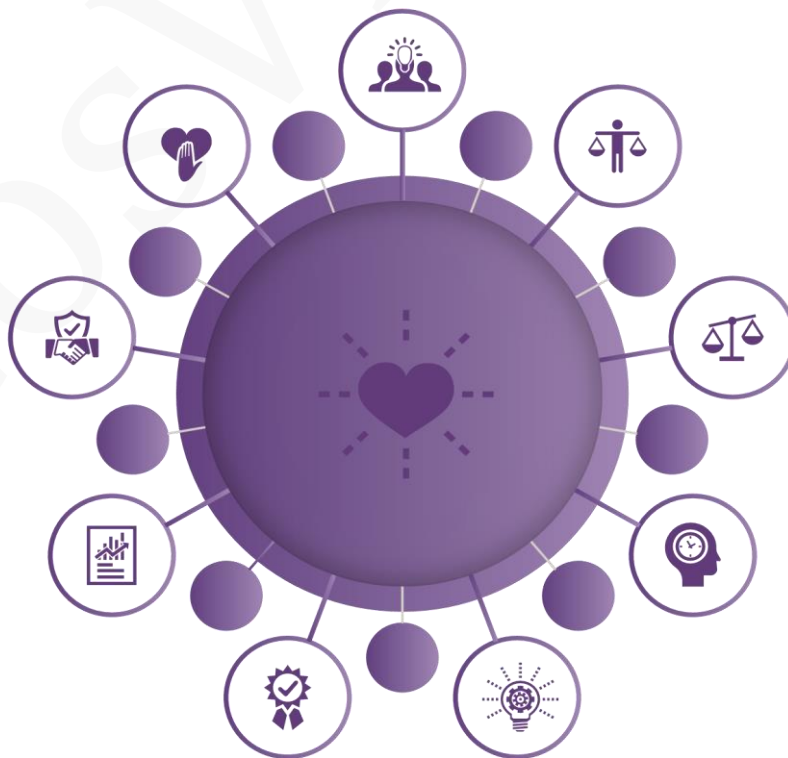
Technology

Overview

CosVM is one of the very few blockchains that exist at the intersection of the Ethereum Virtual Machine **(EVM)** and the **Cosmos** ecosystem. It is an **EVM** compatible Chain built on the **Cosmos SDK,** allowing the chain to exist in the intersection of the **Cosmos** and Ethereum ecosystems while enjoying benefits from both ecosystems.

Solution

CosVM incorporates the **EVM** and is built on top of **Cosmos SDK**. This unique combination enabled CosVM to support:

1: Ethereum Virtual Machine (EVM):

CosVM is powered by Ethermint, which allows rapid porting of smart contracts from **Ethereum** and **EVM** compatible chains. Solidity developers who have prior experiences in building on **Ethereum** or other **EVM** chains can build Decentralized applications on CosVM using Solidity.

2: Tendermint and the Cosmos SDK:

Tendermint and the **Cosmos SDK** are the building blocks making it possible for CosVM to have a secure and consistent consensus engine and a framework for modular blockchain development in the programming language developers are most comfortable with. Interoperability **(IBC + canonical Ethereum-CosVM bridge).**

3: Interoperability (IBC + canonical Ethereum-CosVM bridge):

Inter-Blockchain Communication **(IBC)** allows CosVM to communicate with other **Cosmos SDK**-based blockchains that have **IBC** enabled. It is a cross-chain communication protocol that has many possibilities including asset transfer and cross-chain execution. An upcoming canonical Ethereum-CosVM bridge will makeit possible to bridge **ERC-20** tokens from other **EVM** compatible chains to the CosVM.

4: Proof of Authority (PoA):

Proof-of-Authority **(PoA)** is a more streamlined and scalable consensus built on top of Tendermint' s Proof-of-Stake **(PoS),** while still maintaining security through a range of experienced and carefully-vetted validators.

Consensus Engine

Proof of Authority (PoA)

CosVM is based on Ethermint, which is a scalable, high-throughput proof-of-stake **(PoS)** blockchain, built on top of the **Cosmos SDK** and **EVM** compatible. Ethermint makes use of Tendermint' s **PoS** consensus engine, while having the features of Ethereum at the same time.

CosVM uses a modified version of the Tendermint **PoS.** In the CosVM consensus, validators are vetted by other validators based on their commitment to the CosVM ecosystem, technical ability to implement upgrades flawlessly, track record in operating high availability nodes, and economic viability. Among these permissioned validators, the voting power of each node is determined by the staking token amount that they have been allocated by the validator group. We refer to the CosVM consensus as a Proof of Authority **(PoA)** consensus because the admission of new validator nodes requires existing validators agreeing to donate or delegate staking tokens to these new validators.

In the CosVM consensus, the staking token is not the CosVM token (CVM). Instead, it is a dedicated staking token that is used for governance purposes. This token is not listed and has no market value. Separately, the CosVM (CVM) token is used by end-users to pay network transaction fees which are collected by validator node.

Tendermint

Tendermint is a software used to replicate an application consistently and securely on many machines. There are two important components to **Tendermint,** the consensus engine, Tendermint Core, and the application interface, the Application Blockchain Interface **(ABCI).**

Tendermint core ensures that validators receive the same transactions and in the same order. Validators are running. Byzantine Fault Tolerant **(BFT)** consensus protocol. This means the consensus engine can tolerate

machines failing or becoming malicious. Validators go through a multi-round voting process before coming to a consensus on the contents of a block. When most of the validators agree on this block, this block will be added to the blockchain.

The application interface, **ABCI** makes it possible for developers to use Tendermint for applications in different programming languages and select the development environment suited for them.

On a high level, these are the main reasons why Tendermint is a good fit as consensus engine for CosVM:

- ➢ **Heavily researched and peer reviewed;**
- ➢ **Robustly tested implementation;**

1. Track record of adoption:

Tendermint has been in continuous development since 2014, and has been adopted by several high-profile projects;

2. Modular architecture:

It offers flexibility on which and how applications are developed on top of it.

Cosmos SDK

Cosmos SDK is an open-source framework suited for PoS or PoA blockchains. With the Cosmos SDK developers can create custom blockchains from scratch on top of Tendermint, and natively interoperate with other Cosmos SDK blockchains.

The Cosmos SDK allows for composable open-source modules that can be easily integrated. Developers can use pre-built modules or create custom modules that can be imported into the existing blockchain application.

The Cosmos SDK is inspired by a capabilities-based security model, allowing developers to think more about the security of interactions between modules. Leveraging the experience from different previous blockchain state machines, the Cosmos SDK is a secure environment to build block chains.

Inter-Blockchain Communication (IBC) Protocol

The **Inter-Blockchain Communication protocol (IBC)** is an end-to-end, connection oriented stateful protocol used for reliable, ordered, and authenticated communication between heterogeneous block chains.

This interoperability is achieved by specifying a set of data structures, abstractions, and semantics such that they can be implemented by a distributed ledger satisfying this set of requirements.

The IBC is used for **cross-chain** applications such as token transfers, atomic swaps, **multi-chain** smart contracts and data and code sharding.

Fee Structure

CosVM has lower transaction fees than a typical Proof of Work (PoW) chain thanks to the design architecture and consensus engine. It allows for a higher transaction execution capacity with a lower cost.

Each transaction on CosVM consumes gas during execution based on the computational effort needed. The transaction fee is calculated as the total of gas consumed during transaction execution multiplied by the unit gas price.

CosVM adopts a fee market module with a dynamic fee structure. At each block, a common base fee is calculated dynamically for the next block, depending on the whole network utilization.

Specifically, the fee market module has been designed to support **Ethereum's EIP-1559** transaction format to make CosVM integration simpler for wallets and Decentralized applications. The module's formula to calculate the base fee at each block is also like the formula used by **EIP-1559.** This means that transaction fees will increase when the network is congested, and they will decrease when the network has spare capacity.

Security & Performance

In contrast with **EIP-1559,** the fee market module implemented on CosVM does not burn any of the base fees. The base fee and priority fee continue to be collected by the validators.

CosVM is powered by the Tendermint consensus engine, which is a Byzantine-Fault Tolerant **(BFT)** protocol. It has the following characteristics:

1: Instant finality:

Transactions are confirmed immediately once they are included in a block.

2: Scalability:

Tendermint can process more transactions per minute than the **EVM,** making it faster, cheaper, and carbon-neutral to execute smart contracts.

3: Security:

BFT can tolerate up to **1/3** network node's failure and includes detection of explicit malicious behavior.

Instant finality

A typical **PoW** consensus does not provide fast finality in the sense that blocks could be re-organized to a certain block height given a **51%** attack. The probability of a transaction being revoked goes down as the number of confirmations goes up, so typically users need to wait at least 6 confirmations before their transaction is added to the blockchain. In CosVM instant finality refers to the fact that transactions are finalized once they have been included into a block.

Scalability

CosVM can run more transactions per second than a typical **PoW** chain, as it is based on Tendermint's **PoS**, providing fast finality. The advantage of having higher throughput in the network is that it becomes cheaper to run smart contracts. As transactions are processed up to **20x** faster, there is less backlog driving up the fees, which in turn helps saving transaction fees.

Security

As CosVM utilizes Tendermint's consensus engine, a **Byzantine Fault Tolerant protocol,** it is resistant, even if up to ⅓ of the nodes fail or decide to act maliciously.

Validators currently are **invitation-only** and are selected based on security and performance criteria, including background check, to ensure they are of highest standards. On the technical side, validators are expected to comply with a security checklist and follow best practices when running their nodes.

This includes having:

➢ A secure operating data center.
➢ Backup and redundant hardware to ensure high availability and reliability.
➢ Sentry node architecture for **DDoS** prevention.
➢ Intrusion detection / prevention system installed.
➢ General security checks, including automated patching.
➢ Account security, remote access controls and **KMS** e.g. **HSM** System monitoring and alerting.

The Sentry node architecture is one example of how to set up a validator node to mitigate risk of **DDoS** attacks. A sentry node is like a full node, but uses one or more peers to connect to. These peers can be either a validator or a node. The sentry node serves as a protection layer, like a frontend/backend separation. In case of **DDoS** attacks, multiple sentry nodes with the ability of dynamic scaling can make it much harder to impact the validator node.

The validator uses private connections and is not directly exposed to the public internet. This approach together with proper networking and security best practices such as multiple subnets, firewalls, and redundancy devices, are expected of validators. Below is a solution example on a cloud provider, but one can use any other solution that suits.

The Ethermint implementation of Tendermint has also been thoroughly audited by **Kudelski Security,** and was found to be of high standard. This audit consisted of the following tasks:

➢ Security analysis and architecture review of the original protocol.
➢ Review of the code written for the project.
➢ Assessment of the cryptographic primitives used.
➢ Compliance of the code with the provided technical documentation.

More details on the report can be found in the **security audit report**. Note that this audit was based on the code as of **11 Feb 2022.**

Sustainability

In terms of sustainability, **PoS/PoA** networks are generally less energy-intensive than **Proof-of-Work** networks because validators do not need to solve complex puzzles as in **PoW,** hence their required processing power is much lower.

Furthermore, CosVM nodes can be hosted with ARM chips, compare to standard intel **x86_64** architecture, it further reducing carbon footprint of hosting a node from around **1380 kgCO$_2$eq** to 240 **kgCO$_2$eq per year.**

Compared to **74.95 kgCO$_2$eq** for Ethereum and **823.96 kgCO$_2$eq** for Bitcoin, CosVM has an approximate value of **~0.005kgCO$_2$eq** emissions per single transaction, making it much more sustainable with its low carbon footprints.

Governance

CosVM validators hold two types of tokens: **CVM,** which validators collect from users in the form of transaction fees; and the CosVM Staking Token, which is allocated to validators as part of the Proof of Authority governance of the CosVM chain and represents their voting power in the consensus and other on-chain decisions.

The CosVM community may make governance proposals as they see fit. **For example,** when there is a request to change blockchain parameters or community spending, community members can draft an initial proposal with feedback from the community. To officially submit a proposal on the mainnet, a minimum amount of **CVM** needs to be deposited during the deposit period, which lasts **14 days** or until the minimum amount of deposit is reached. After which the voting period starts, and voting power is counted depending on bonded stake. A governance proposal is passed when the deposit requirements are met **(i.e. 33.33% of the network's voting power has voted and most of the voting power has backed the "yes" vote).**

Reward/Penalties

Validators are expected to maintain a stable infrastructure and help to secure the network. If the validators fail to achieve this, they are subjected to certain forms of punishment depending on the severity. **Such punishments include**

Jailing - Liveness Faults (Low availability)

Validators are **"jailed"** if they do not sign blocks for a certain period. During the jailing period, validators are excluded from the active validator list and are not allowed to sign any blocks. The jailing period provides validators a chance to recover their infrastructure

without further impacting the network stability. At the same time, the exclusion from signing blocks is a punishment to the validator because they cannot obtain any rewards during this period.

Byzantine Faults

A validator makes a byzantine fault when they sign conflicting messages/blocks at the same height and consensus round. **Tendermint** has mechanisms to publish evidence of validators that signed conflicting votes so they can be punished by being slashed.

When byzantine faults are detected, validators are immediately slashed and jailed. Their stake will be deducted and validators who commit this **double-signing** fault will also be put into the **"tombstone state"**, which means they are blacklisted and jailed forever.

Protocol and Storage Optimizations

There is significant potential to increase the scalability of CosVM by increasing block size and reducing the time between blocks, which were **10 million** gas and **5-6 seconds** respectively when CosVM went live in **November 2021.** As of **mid-2023,** block size has already been increased to **40 million** and tests are under way to reduce block time to potentially **3-4 seconds.**

The CosVM team is constantly working with the **Cosmos SDK** community to identify ways to optimize data storage to increase node efficiency. Improvements in data storage technology have, and will continue to deliver drastic increase in node start-up and execution

speed. Examples of upgrades completed or planned include: introduction of **RocksDB** and **VersionDB**, optimization of **IAVL** and introduction of **MemIAVL**, and address recovery caching.

The CosVM **blockchain** can deliver increased scalability through the deployment of **layer-2** blockchains sharing CosVM as the **layer-1** settlement layer. Optimistic rollup technology is currently the most mature **layer-2** technology, to be followed by **zk** rollup technology. With **layer-2s**, the CosVM ecosystem can support hundreds or even thousands of transactions per second **(10x to 30x** the **TPS** of CosVM as of **mid-2023).**

Looking ahead at **2024,** CosVM will continue to leverage innovations from the Ethereum and the **Cosmos SDK** communities **(while also contributing to them)** to deliver further scalability.

Connectivity and Interoperability

Users can transfer CRC-20 tokens from and to other IBC-enabled chains in a Decentralized manner, which means that the transfers are confirmed by validators and enjoy the same level of security as Additional IBC channels and features will also be introduced.

Users will be able to transfer crypto assets from other chains of the Cosmos ecosystem, or other IBC-compatible chains, to CosVM. Other transactions on the CosVM chain. Upcoming Cosmos SDK and IBC interoperability modules will bring several functionalities to CosVM.

1: Interchain accounts (ICS-27):

This module allows an account on CosVM chain to securely control an account on another **IBC-**compatible chain and to get it to send transactions on its behalf.

2: Relayer Incentives (ICS-29):

This module makes it possible for the operator of an **IBC** bridge relayer to charge end-users flexibly, which enhances the economic viability of the bridge. **As a result,** the number of relayers between CosVM and other **IBC-**compatible chains will grow.

3: Non-fungible token standard:

This module will support the transfer of **NFTs** between CosVM and other chains that support **NFTs (e.g., OmniFlix, IRISnet, Pylons).**

4: EVM packets over IBC:

This module will allow CosVM users to interact with proxies of smart contracts that live on another **EVM-**compatible blockchain (e.g., Evmos, Umee).


Tooling and Infrastructure

Many of the development frameworks, libraries, and tools used by blockchain developers are already available on CosVM. **Examples** of developer tools include Truffle Suite, Hardhat, Open Zeppelin contract libraries, **web3.js**, **ethers.js** and **web3.py**.

Most of the tooling that **dApp** developers have come to expect from a leading **EVM-**compatible chain are available on CosVM**:**

- ➢ Highly reliable commercial **RPC** endpoints for access to **on-chain data,** plus additional protocols, and vendors to query large numbers of on-chain data points.
- ➢ More than **15 self-custodial** wallets.
- ➢ Several analytics **platforms** to better understand on-chain data **(e.g. Debank, vFat.tools, Defillama, Ape Board, NFTScan, dAppradar).**
- ➢ Oracle protocols **(eg. Pyth, Band Protocol, Witnet).**

Decentralized Applications (dApps)

CosVM is an open ecosystem supported by a wide range of more than **500 contributors**, **validators**, and **dApp** developers. Moving forward, ecosystem-bootstrapping initiatives will continue to be launched to raise awareness of CosVM among **dApp** developers and support builders working on innovative **DeFi**, **NFT**, and **Metaverse** projects.
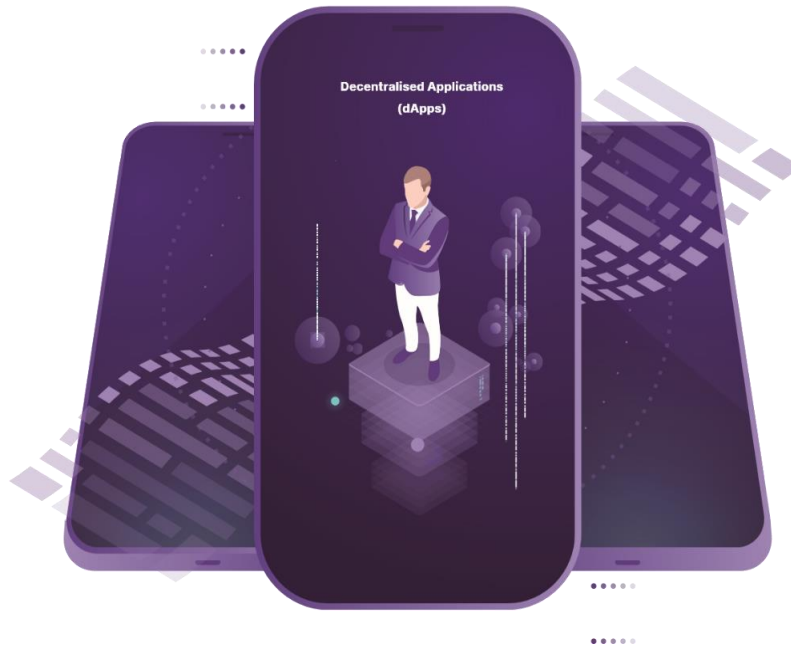
Ecosystem Support

CosVM Labs

CosVM Labs is a blockchain startup accelerator that focuses on Decentralized Finance, blockchain games, and the CosVM chain ecosystem development.

CosVM Ecosystem Development

CosVM Labs helps builders create user-friendly applications on CosVM and drive mainstream adoption of **Web3**.

Ecosystem programs include financial incentives, technical support, marketing support and investor introductions.

1: CosVM Ecosystem Grants:

The ecosystem grant program focuses on accelerating the implementation of infrastructure components, developer tools, product integrations and user/developer education programs that are critical for the development of the CosVM ecosystem.

2: CosVM Accelerator:

The accelerator program is a structured **10-week** launchpad that helps app builders to achieve product market fit and significantly increases the effectiveness of their fundraising efforts.

3: CosVM Labs Incubator:

CosVM Labs incubates talented **dApp** product development teams and provides them with the means and tools to create outstanding **DeFi** and **GameFi** applications.

4: Strategic Partnerships:

CosVM Labs establishes ad-hoc partnerships with proven founders, Web3 protocols and technology companies who can significantly advance the user and developer experience on the CosVM chain.

5: Hackathons:

CosVM Labs supports several hackathon programs as organizer, sponsor, or judge.
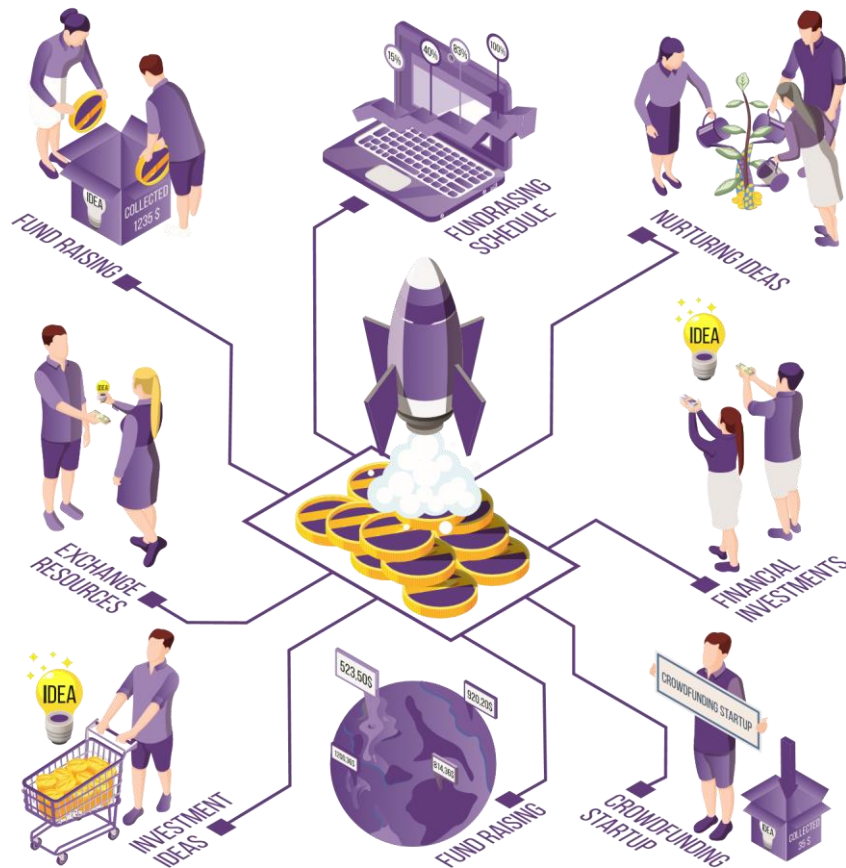
CosVM Ecosystem Grants

Purpose

The CosVM **Ecosystem Grants** program aims to support early-stage projects on CosVM by bootstrapping initial product development and providing technical support. We aim to align incentives with new builders and teams by helping their projects grow with the broader ecosystem.

Program Benefits

1: Milestone Incentives:

The CosVM **Ecosystem Grants** is not a source of venture capital funding but rather a form of monetary support provided by CosVM Labs. Project recipients would be awarded grants based on the quality of the team, the potential of the project execution capabilities, and its contribution to CosVM. Grants will be awarded based on certain **pre-agreed** milestones **(for example, delivery of MVP, beta launch).**

2: Technical Support:

To reduce the friction of producing a well-functioning Minimal Viable Product **(MVP)** on CosVM, grants recipients can expect technical support and assistance from CosVM developers.

3: Marketing Support:

Projects may receive marketing support across social media channels on CosVM.

4: Ecosystem Introductions:

Projects may relate to ecosystem partners who could potentially decide to support future development of the projects.

Requirements

Projects should be following these standards and guidelines to qualify for funding consideration:

1. Projects must be building an application directly on the CosVM blockchain

2. Projects must be building an application that fall within the following categories:

- **DeFi** (AMM/DEX, lending, structured finance, yield aggregators, derivatives, liquid staking)
- **NFT** (NFTs, NFT marketplaces, Inter-NFT applications)
- **Gaming & Metaverse** (Metaverse, Play-To-Earn game, Play-And-Earn game)
- **Tools & Analytics** (DeFi protocols tools, charting solutions, dashboards, analytics, developer tools) **Critical Infrastructure Projects** (Oracles)
- **Social Goods and Community Engagement Projects** (community forums, governance tooling's, DAO projects, educational YouTube videos, dedicated medium articles)
- **Other Web 3.0 Applications** (Decentralized storage, Decentralized social media, Decentralized IP management)

3. Project must uphold high security standards, such as code audits and verification of smart contract code on the CosVM can block explorer.

CosVM Play

CosVM **Play** is a comprehensive modular suite of developer tools and services to streamline the creation of gaming and **GameFi** applications in the CosVM ecosystem. CosVM Play is an essential pillar of CosVM's strategy to bring tens of millions of end-users to **Web3.** The developer platform will consist of integrations, developer products, and services supporting multiple game platforms and languages such as the Unity engine, the Unreal Engine, and the **C++** programming language.

ChainSafe Integration

ChainSafe is a leading blockchain research and development firm specializing in infrastructure solutions for **Web3**. Alongside its contributions to major ecosystems such as **Ethereum, Polkadot, Filecoin, Mina, Cosmos,** and more, ChainSafe has a growing portfolio of Web3 products — Files, Storage, the **Gaming SDK**, and ChainBridge. As part of its mission to build innovative products for users and improved tooling for developers, ChainSafe embodies an open-source and community-oriented ethos to advance the future of the internet.

CosVM **Play** can be integrated with Chain Safe's **Gaming SDK**, W**eb3.unity, an** open-source software developer kit maintained by ChainSafe, a leading blockchain **R&D** firm specialising in infrastructure solutions for **web3.**

ChainSafe's **Gaming SDK**, **web3.unity,** enables mobile, web, and desktop games created with the Unity engine to easily interact with common Web3 smart contracts such as **ERC20** and **CRC20** token contracts and **ERC721** and **ERC1155 NFT** contracts. Game developers can access on-chain data in-game, fetch user wallet addresses, connect to the CosVM **chain**, query cryptocurrency and **NFT** balances, send transactions, and transfer **NFTs** as part of the suite of out-of-the-box functionalities.

Roadmap

The CosVM **Play roadmap** includes integration with many open-source libraries and connectivity to commercial services such as **Crypto.com Pay**. Games will be able to receive payment cards and crypto payment processing easily. Users will be able to sign blockchain transactions via the **Crypto.com DeFi** wallet, the **MetaMask** wallet, or other wallets compatible with Wallet Connect.
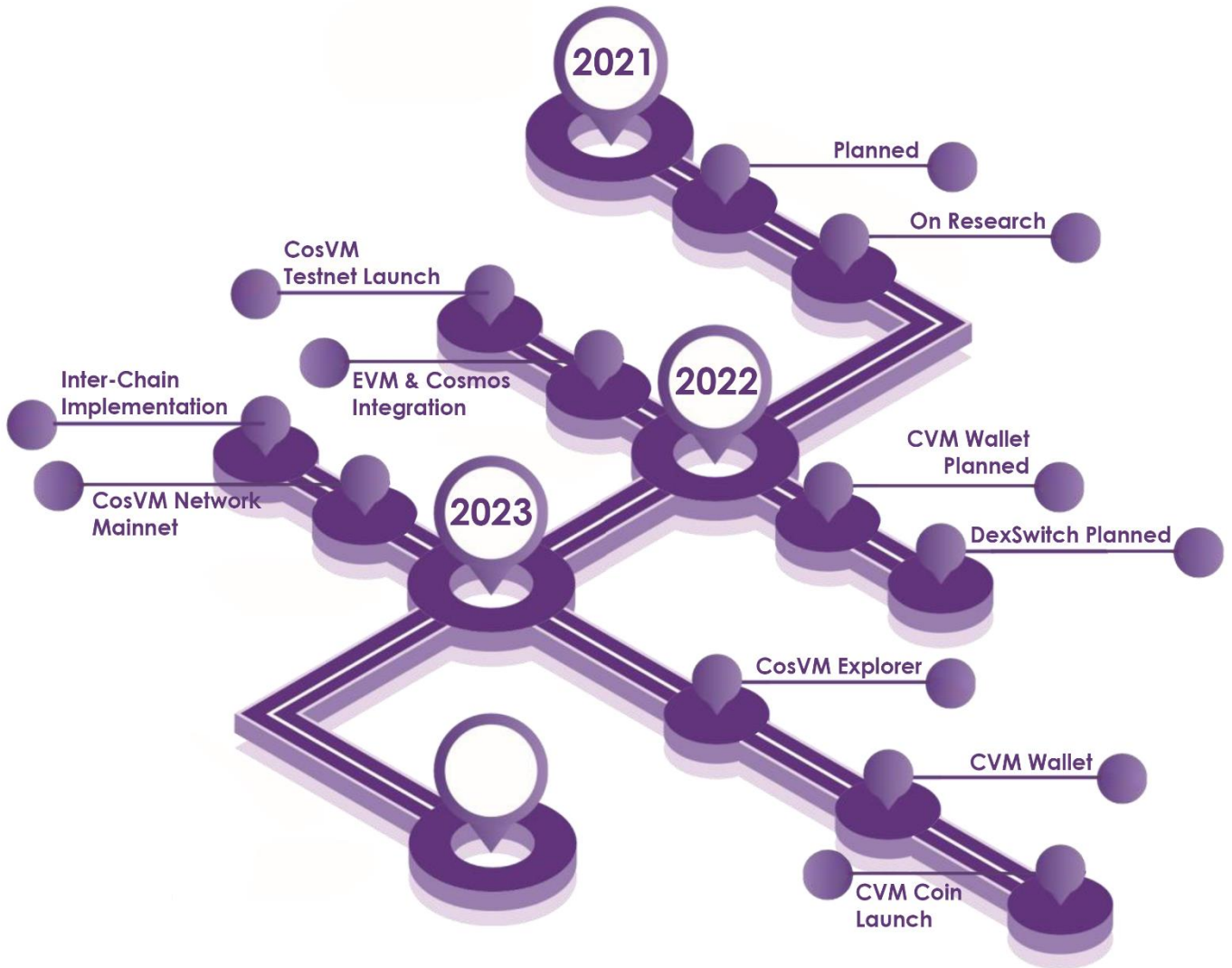
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Graphics

All graphics included in this whitepaper are for illustrative purposes only. **Graphics** with price references do not translate into actual pricing information.

Risk statements

Purchasing **CosVM**-supported tokens or interacting with **CosVM**-supported applications or protocols involves substantial risk and may lead to a loss of a substantial or entire amount of the money involved.

Prior to purchasing **CosVM**-supported tokens or interacting with **CosVM**-supported applications or protocols, you should carefully assess and consider the risks, including those listed in any other documentation. A purchaser should not purchase **CosVM**-supported tokens for speculative or investment purposes.

Purchasers should only purchase **CosVM**-supported tokens if they fully understand the nature of the **CosVM**-supported tokens and accept the risks inherent to such tokens, their relevant applications and protocols, and the CosVM Network itself.

Cryptographic

Tokens may be subject to expropriation and/or theft; hackers or other malicious groups or organizations may attempt to interfere with the CosVM Network or relevant applications or protocols in various ways, including **malware attacks, denial of service attacks, consensus-based attacks, Sybil attacks, smurfing,** and **spoofing** which may result in the loss of your cryptographic tokens or the loss of your ability to access or control your cryptographic tokens.

In such event, there may be no remedy, and holders of cryptographic tokens are not guaran -teed any remedy, refund, or compensation.

The regulatory status of **cryptographic tokens** and digital assets is currently unsettled, varies among jurisdictions and is subject to significant uncertainty. It is possible that in the future, certain laws, regulations, policies, or rules relating to **cryptographic**.

Tokens, digital assets, blockchain technology, or **blockchain applications** may be implemented which may directly or indirectly affect or restrict cryptographic token holders' right to acquire, own, hold, sell, convert, trade, or use cryptographic tokens.

The uncertainty in tax legislation relating to cryptographic tokens and digital assets may expose cryptographic token holders to tax consequences associated with the use or trading of cryptographic token.

Digital assets and related products and services carry significant risks. Potential purchasers should consider all the above and assess the nature of, and their own appetite for, relevant risks independently and consult their advisers before making any decisions.

Professional Advice

You should consult a lawyer, accountant, tax professional and/or any other professional advisors as necessary prior to determining whether to purchase CosVM -supported tokens or operate applications on top of the CosVM Network.

Caution Regarding Forward-Looking Statements

This whitepaper contains certain forward-looking statements regarding the business we operate that are based on the belief of CosVM Labs as well as certain assumptions made by and information available to CosVM Labs. We do not purport to make any statements with respect to the conduct or operations of any third parties whose actions (including commercial activity) may affect the CosVM Network.

Any forward-looking statement speaks only as of the date of which such statement is made, we undertake no obligation to update any forward-looking statements to reflect events or circumstances after the date on which such statement is made or to reflect the occurrence of unanticipated events.

Forward-looking statements, by their nature, are subject to significant risks and uncertainties. Forward-looking statements may involve estimates and assumptions and are subject to risks, uncertainties and other factors beyond our control and prediction. Accordingly, these factors could cause actual results or outcomes that differ materially from those expressed in the forward-looking statements.