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Intro to FVM - Filecoin Virtual Machine

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Filecoin Virtual Machine

The FVM project delivers on-chain programmability to the Filecoin network.

https://fvm.filecoin.io/

Let’s Start with WASM - aka Web Assembly

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WA

A Run-time Environment for the browser

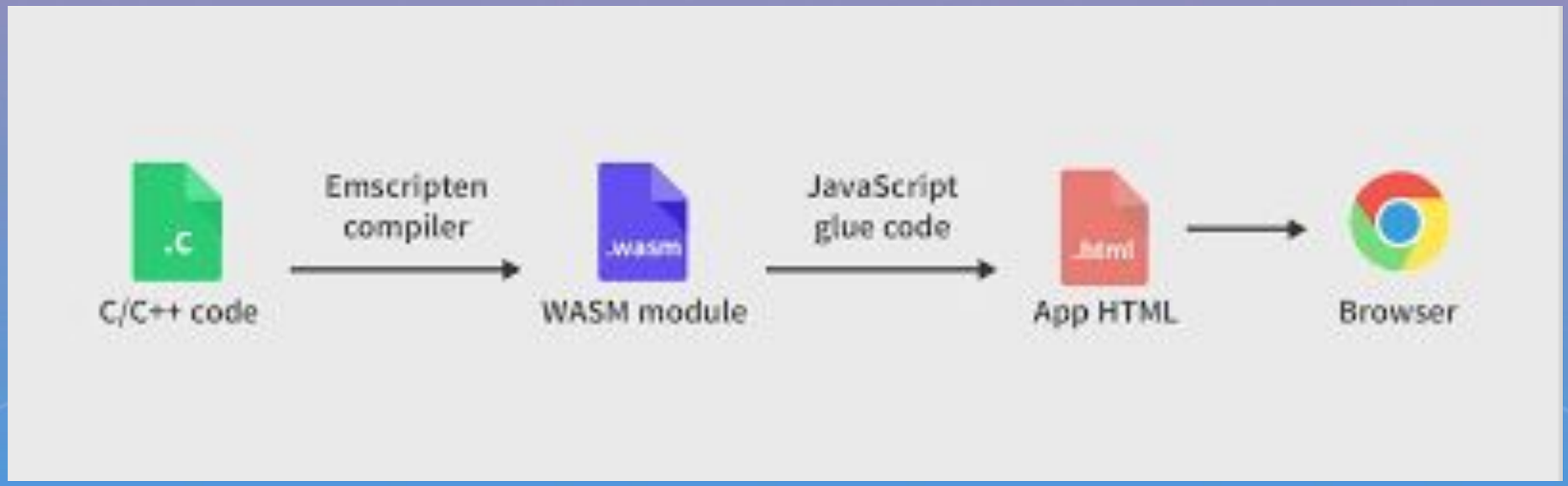

Image Credit:
https://tapadoo.com/wasm-the-future-of-the-web-and-how-affect-the-app-market/

Micro-Service Architecture

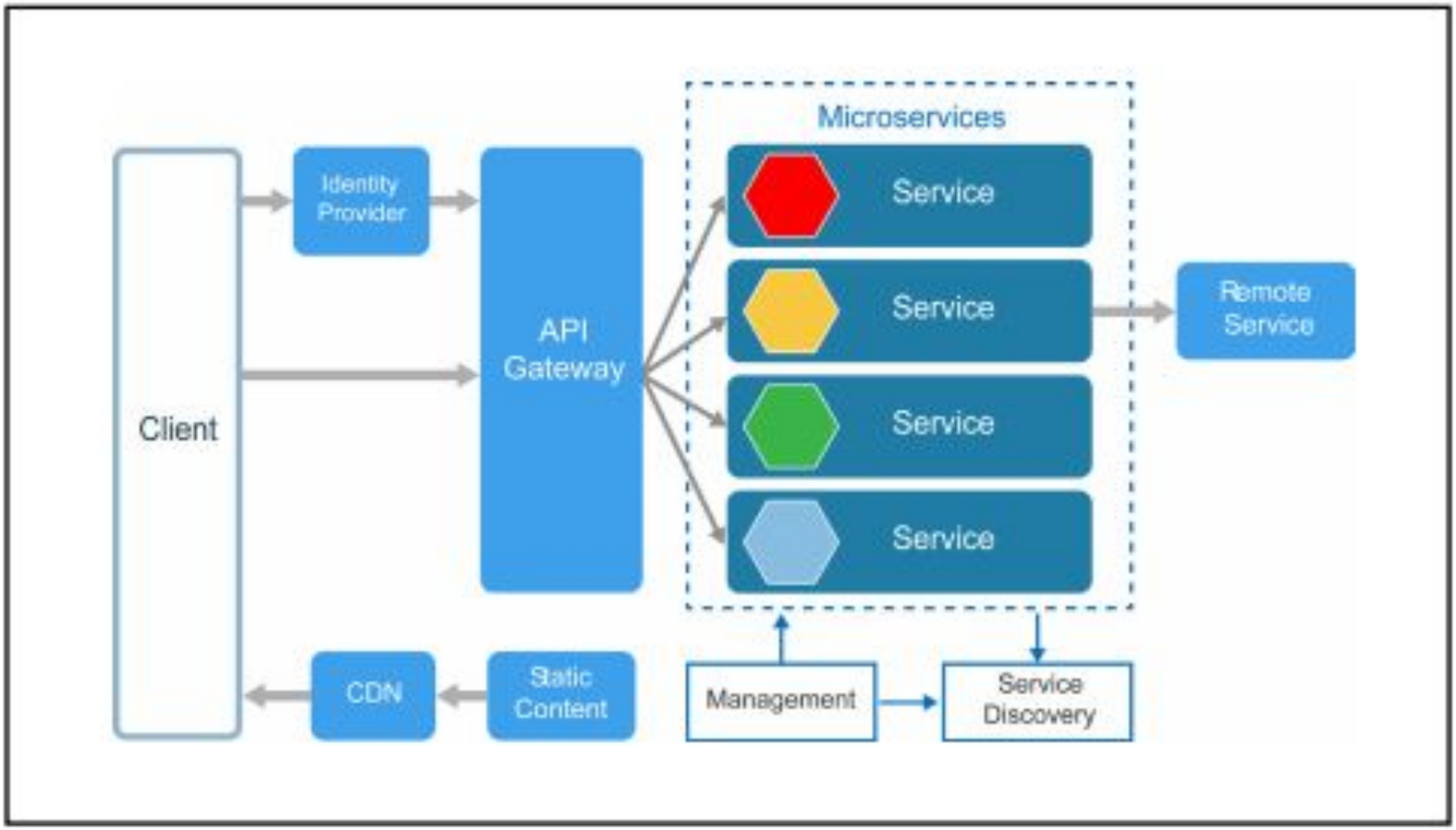

Image Credit: https://azure.microsoft.com/en-in/solutions/

FVM Architecture

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Based on WebAssembly
using wasmtime under the hood

Built to support multiple runtimes
EVM, Wasm (passthrough), SES, LLVM IR, BPF, etc.

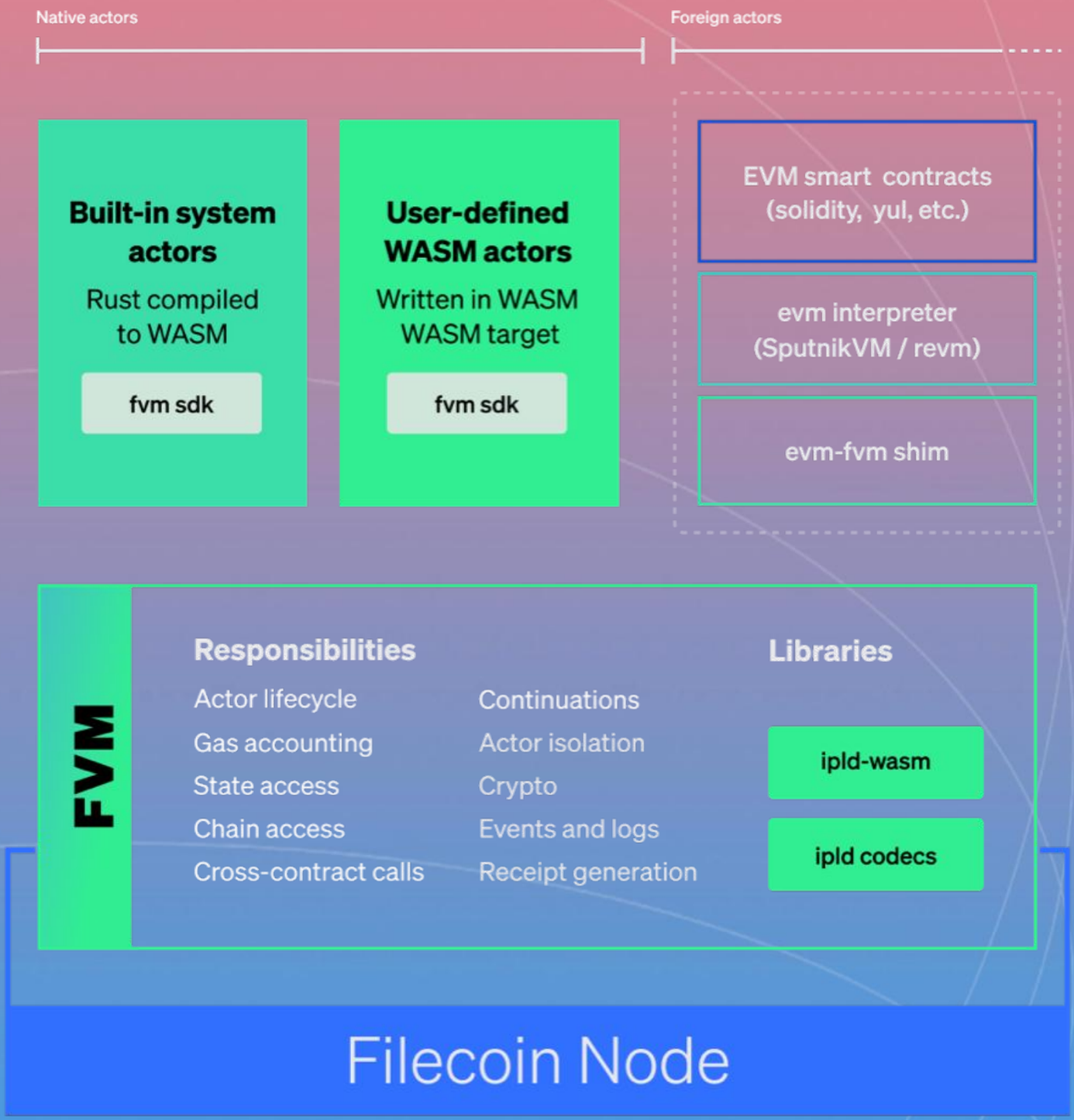
Low level system calls
Unix inspired architecture to interact with the env

IPLD-native
all data (params, state) is IPLD

Foreign addressing support
via delegated addressing

Abstract accounts
supporting foreign signature schemes, and more

Built-in resource metering
for gas accounting



What can you do with FVM?

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Perpetual, renewable storage

Storage Insurance

Smarter Storage Markets

Trustless Reputation Systems

Automatic Upgrades

Replication Workers

DeFi for Storage

Repair Workers

L2 Commitments

Quality of Service

Dataverse/Data DAOs

On-Chain Voting

Storage Bounties

Storage Futures/Derivatives

Sector Auctions

Tokens

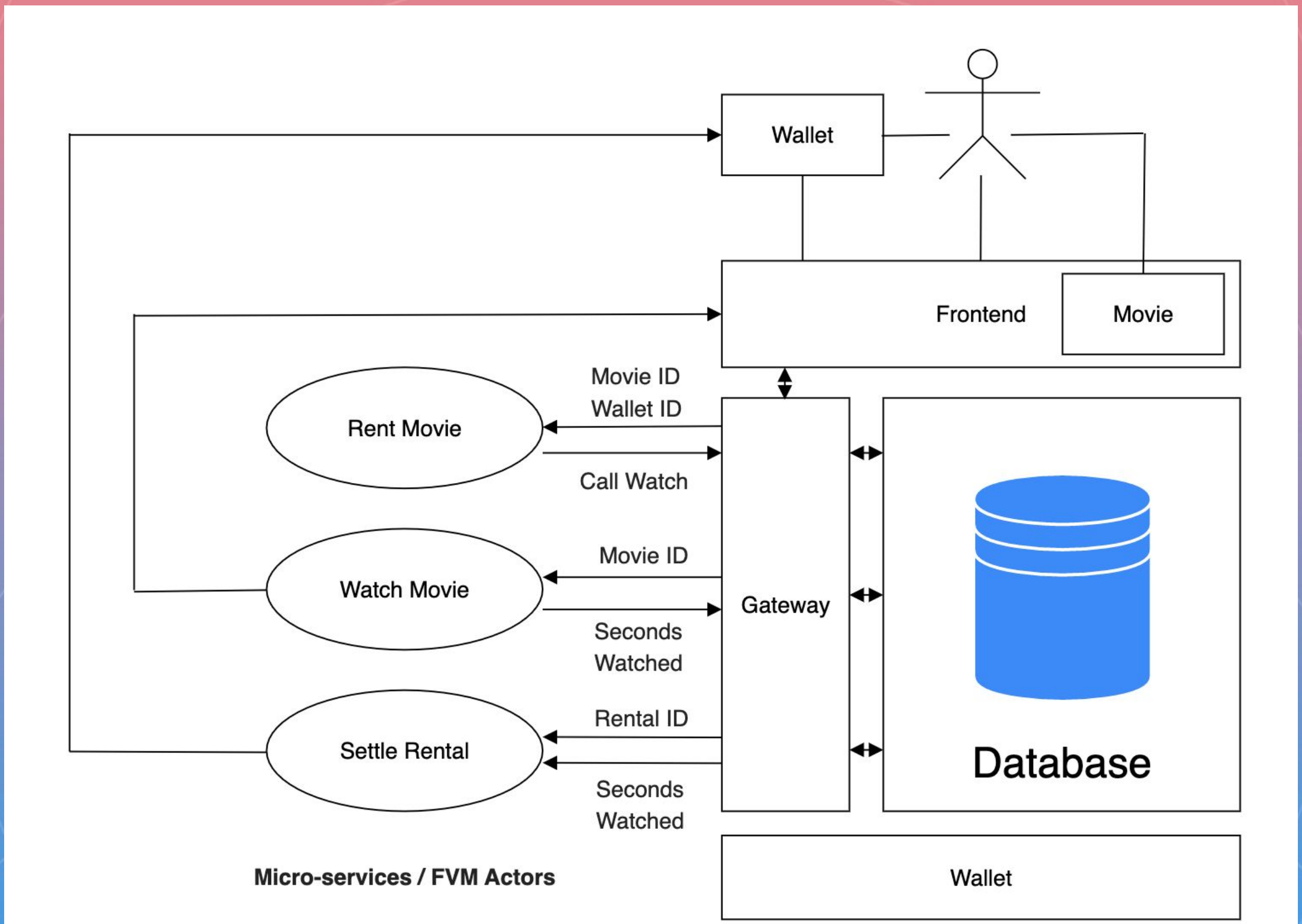
NFTs

Bulk Discounts

Decentralized, Verifiable Computation

Time-locked Retrieval

Movie Rental Example - Pay per Second



Metamask Integrations

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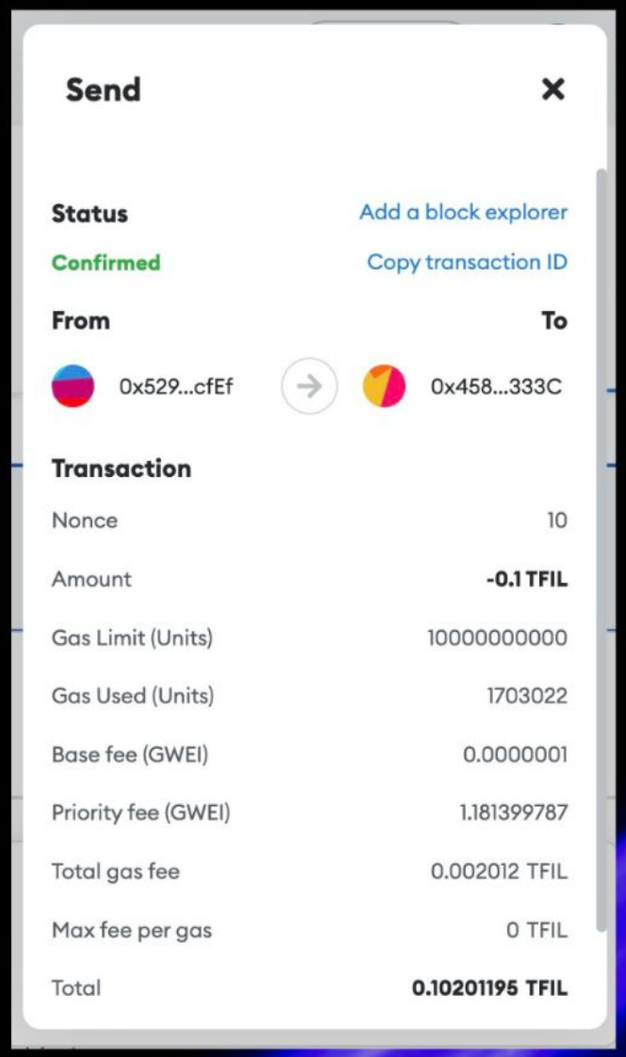
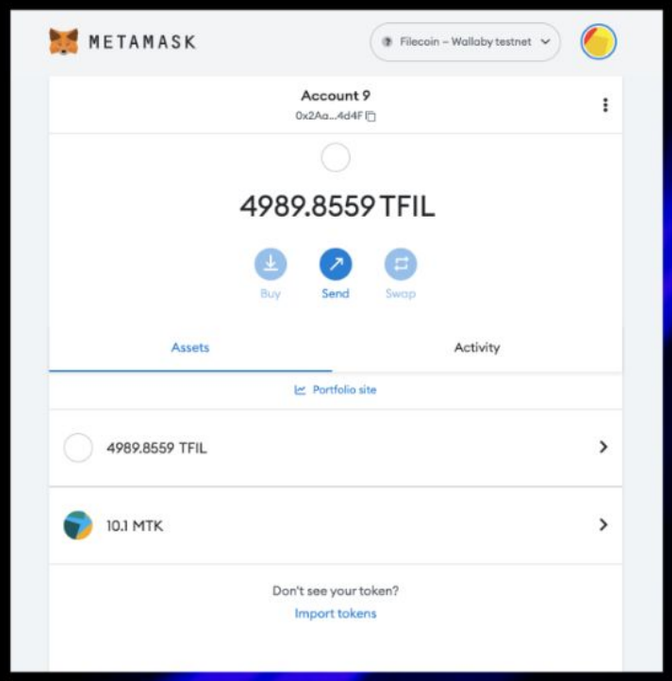
Filecoin + Metamask

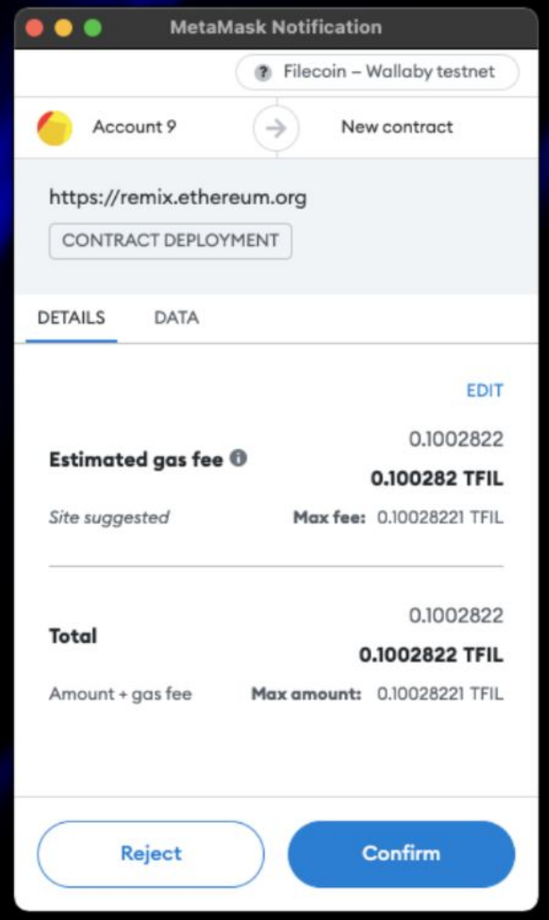
Value transfers



ERC-20



Contract calls



IDEs - Remix & Hardhat

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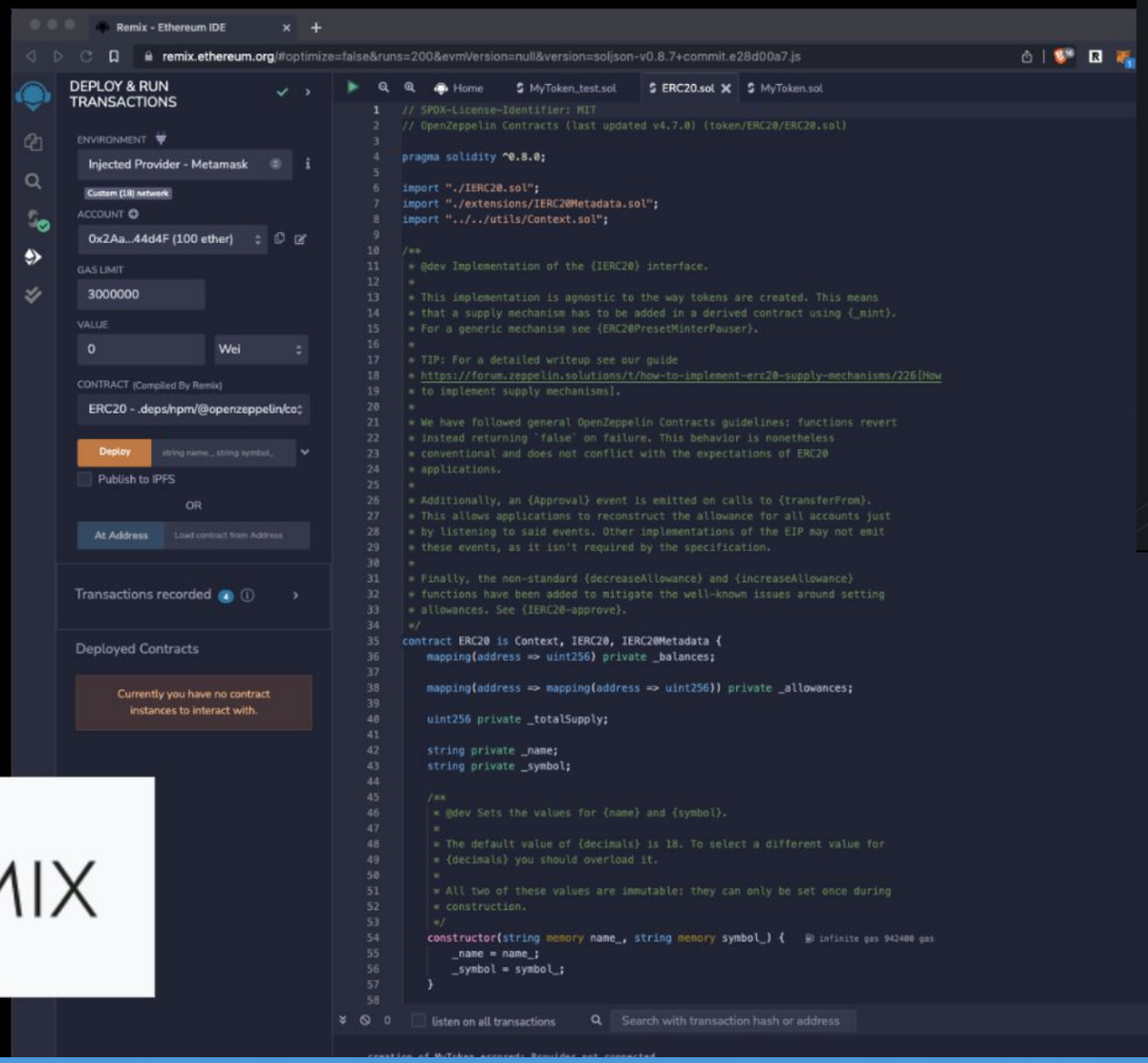
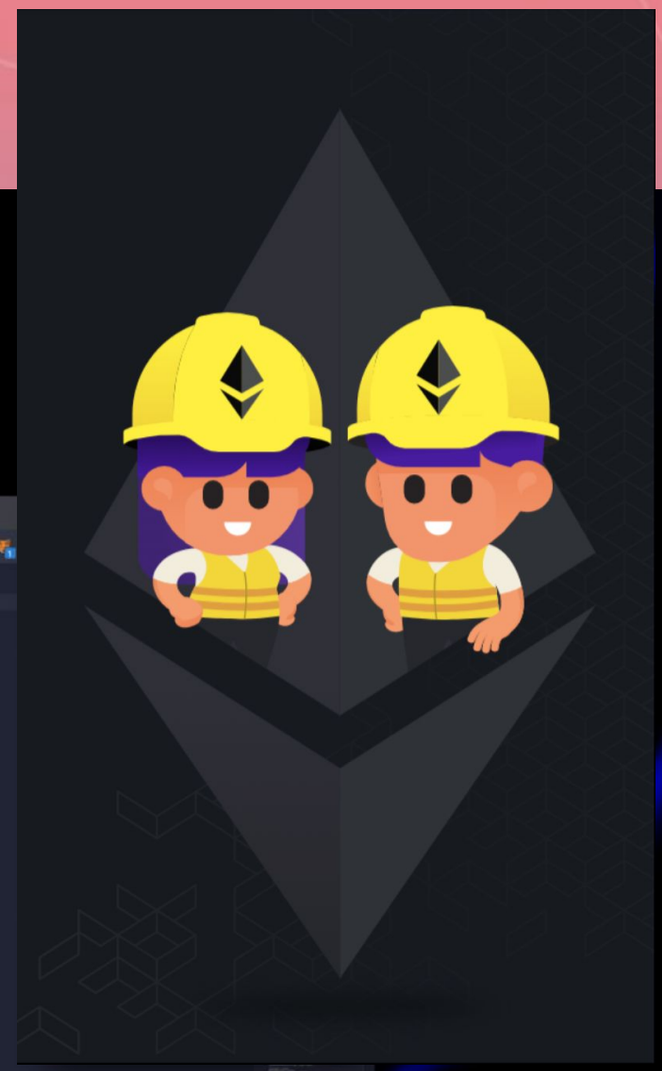
Filecoin + Remix IDE





REMIX

Hyperspace Test Net is Live!

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Faucet

Please input your address to receive test FIL (tFIL) on the Hyperspace Testnet. This faucet dispenses 5 tFIL.

t0/1/2/3/4 or 0xETH

Send

I am human

hCaptcha
Privacy - Terms

https://hyperspace.yoga/#home

FVM Roadmap

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May 2022

Milestone 1: Introduction of non-programmable WASM-based FVM

Mainnet will atomically switch from the current legacy VMs to the WASM-based reference FVM. A new gas model will be activated that accounts for actual WASM execution costs. Only Rust built-in actors will be supported at this time. This milestone requires a network upgrade.

Nov 2022

Network Version 17 (nv17): Initial protocol refactors for programmability

An initial set of protocol refactors targeting built-in actors, including the ability to introduce new storage markets via user-defined smart contracts. Review the full planned scope of Filecoin Network Version 17.

Mar 2023

Milestone 2.1: Ability to deploy EVM contracts to mainnet (FEVM)

The Filecoin network will become user-programmable for the first time. Developers will be able to deploy smart contracts written in Solidity or Yul, and compiled to EVM. Smart contracts will be able to access Filecoin functionality by invoking built-in actors. Existing Ethereum tooling will be compatible with Filecoin. This milestone requires a network upgrade.

Sep 2022 → Dec 2022

Incremental delivery on the Wallaby testnet

Bleeding edge releases of the Filecoin EVM runtime are deployed every 1-2 weeks to the Wallaby developer testnet. The community is invited to participate in alpha testing to provide early feedback.

Jan 16th 2023

Hyperspace testnet goes live

A new stable developer testnet called Hyperspace will be launched as the pre-production testnet. The community is invited to participate in heavy functional, technical, and security testing. Incentives and bounties will be available for developers and security researchers.

Mar 2023 (Est.)

FEVM goes live on mainnet

The Filecoin EVM runtime is deployed on Filecoin mainnet via the Filecoin nv18 Hygge upgrade.

midyear 2023 (Est.)

Milestone 2.2: Ability to deploy Wasm actors to mainnet

Developers will be able to deploy custom smart contracts written in Rust, AssemblyScript, or Go, and compiled to WASM bytecode. SDKs, tutorials, and other developer materials will be generally available. This milestone requires a network upgrade.

2023

Milestone 3+: Further incremental protocol refactors to enhance programmability

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List of Links to Learn More about FVM:

https://github.com/filecoin-project/community/discussions/585

Thank You

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