



Haym @SalomonCrypto

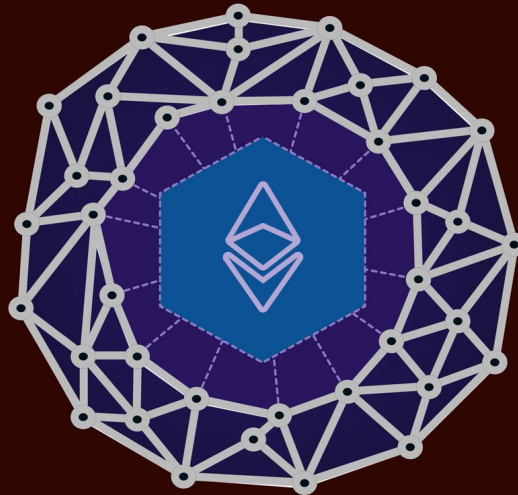
Sep 27 · 24 tweets · [SalomonCrypto/status/1574618174879735808](https://twitter.com/SalomonCrypto/status/1574618174879735808)

(1/23) [@ethereum](https://twitter.com/ethereum) Virtual Machine (EVM)

Ethereum is the World Computer, the future's internet-native global settlement layer. The EVM is the core of Ethereum; it provides the world in which settlement and decentralized computation happens.

Read on to learn about core \$ETH tech!

Ethereum Virtual Machine (EVM)



(2/23) A Virtual Machine (VM) is a computer program that emulates a complete, independent computer system entirely within another computing environment.

Imagine running a copy of Windows as an application on your Mac.



(3/23) Instead of developing software for a specific machine or type of machine, a VM allows development into a neutral environment.

The computing environment offered by the VM will be exactly the same, regardless of what real-world computer it is running on.



(4/23) VMs are nearly as old as modern computing; today they have many uses across nearly every use of technology.

Regardless of how varied the application, the through-line is the same: VMs provide a uniform computing platform across an unpredictable range of hardware.

(5/23) Our discussions thus far have discussed VMs from the perspective of developers, but now let's take a different look.

Let's think about what a uniform computing platform means for consumers.

(6/23) A basic VM is a single program that exists on a specific computer. It provides an environment with the exact same rules as any other copy, but it doesn't provide the SAME environment.

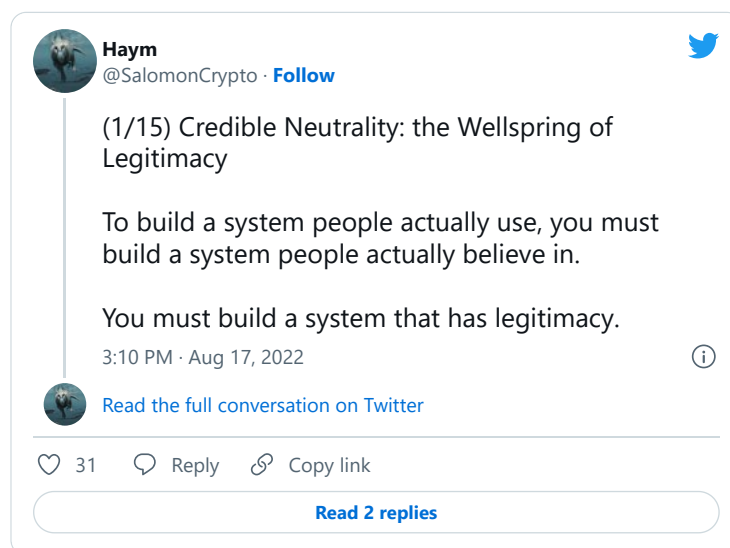
Eg: We both have the same VM. If I save a document on mine, it won't appear in yours.

(7/23) Now let's imagine a world where VMs can actually provide the SAME environment. There's a lot of reasons why we would be interested in this, but I stay focused on the most important:

If you exist within the same environment, you know you share the same constraints.

(8/23) Anyone who chooses to enter the VM has implicitly decided to follow the rules set forth by the VM. No special hardware (and performance edge), no special access, no administrative privilege.

A credibly neutral environment for all that enter.



(9/23) At this point it's time to bring in the hero of our story: the Ethereum Virtual Machine (EVM).

The EVM is the computing platform of [@ethereum](#), kept alive by the Ethereum network and enshrined in the Ethereum blockchain.

Together, these 3 parts form the World Computer.

**Haym**
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(1/7) The Hitchhiker's Guide to [@ethereum](#)

In 2014, [@VitalikButerin](#) gave us an idea that WILL change the world. Have you wrapped your head around The World Computer yet?

DON'T PANIC, I'll break it down for you. Read on for 4 threads that will show you the future.

Ethereum

The World Computer



The diagram illustrates the 'World Computer' stack. At the top is a blue square icon with a white Ethereum logo. Below it is a blue pyramid shape filled with a grid of small white squares. At the base of the pyramid is a blue network diagram consisting of interconnected nodes and lines.

Virtual Machine (EVM)

Ethereum Blockchain

Ethereum Network

1:01 AM · Aug 3, 2022 

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(10/23) Technically speaking, [@ethereum](#) is a Turing-complete distributed state machine; if theoretical computer science is your jam I encourage you to check out the link below.

For this thread, we will stay higher level.

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(1/19) Computer Science Fundamentals: Blockchain Computers, [@Bitcoin](#) and [@ethereum](#)

What is a blockchain computer and what makes it special? How did [@VitalikButerin](#) build on top of Bitcoin to create Ethereum? Why is Ethereum The World Computer?

This thread has answers!

The infographic is titled "Blockchain Computer State Systems" and is divided into three main sections: "State Transition Machine", "Bitcoin State Transition System", and "Ethereum State Transition System".

- State Transition Machine:** Shows a sequence of states (State N, State N+1, State N+2) connected by "State Transition Function" arrows. A transaction (Transaction X) is shown as an input to the function.
- Bitcoin State Transition System:** Shows a "State" table with columns "Account" and "Balance". A "Transaction" table with columns "Spent", "Signature", and "Amount" is shown. A "State'" table shows the updated state after the transaction.
- Ethereum State Transition System:** Shows a "State" table with columns "Account", "Balance", and "Nonce". A "Transaction" table with columns "To", "From", "Value", and "Gas" is shown. A "State'" table shows the updated state after the transaction.

Below the infographic, there is a section titled "The Universal State Machine" which states: "A Turing Machine is a mathematical model of computation used to investigate the theoretical limits of computer science. Using a small set of simple rules, the machine is capable of simulating ANY computer algorithm." It includes a diagram of a Turing Machine tape with binary digits (0s and 1s) and a head moving across it.

10:38 PM · Aug 5, 2022

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(11/23) The purpose of the greater [@ethereum](#) apparatus is to offer a single shared computing platform in a manner that is secure, decentralized and permanently open for ALL.

Anyone with an internet connection (and gas money) can interact with the World Computer.

(12/23) Within the EVM, there are a few entities:

Accounts - representing real people who are using the World Computer

Contracts - representing a program that exists inside the EVM. Contracts are accounts that are controlled by the code

(13/23) Objects - representing tokens, NFTs and anything else that can be represented within the EVM (remember, the EVM is Turing-complete; any object can be represented in the EVM)

\$ETH - the fuel/electricity/energy/currency of the World Computer

(14/23) The EVM has these critical properties:

- Everything the EVM does is recorded into blocks and is added to the (public) blockchain
- Anything recorded in the blockchain cannot be undone
- All objects have owners and cannot be altered without the permission of their owner

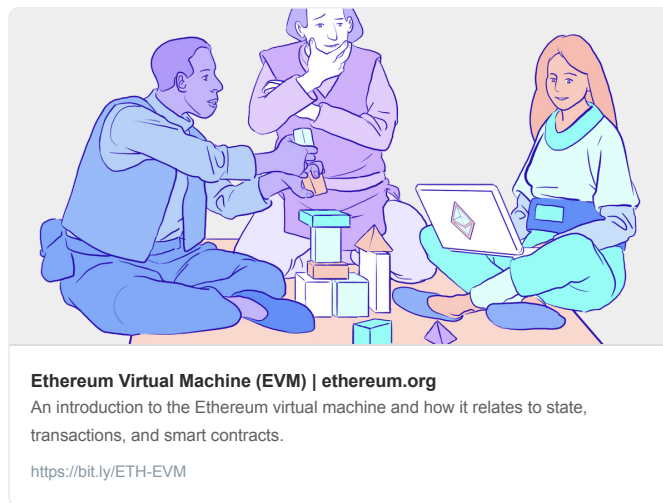
(15/23) Thus, the EVM provides a generalized, credibly neutral computing environment with a native notion of property.

This is the vision of the World Computer: one environment, one set of rules, one source of truth.

Globally accessible. Any time. Anywhere. For any reason.

(16/23) At this point, we are going to depart from our explanation of the EVM. For a deeper dive, here are some links:

[@ethereum](#)'s EVM page:



So-Fi's EVM breakdown:



What Is the Ethereum Virtual Machine (EVM)? | SoFi

What is an Ethereum virtual machine (EVM)? Learn more from SoFi about what purpose the EVM serves and some of its primary benefits.

<https://bit.ly/ETH-EVM-SoFi>

(Semi-) technical breakdown:

```
pragma solidity >=0.4.22 <0.6.0;

contract Mortal {
    /* Define variable owner of the type address */
    address owner;

    /* This constructor is executed at initialization and sets the owner of the contract */
    constructor() public { owner = msg.sender; }

    /* Function to recover the funds on the contract */
    function kill() public { if (msg.sender == owner) selfdestruct(msg.sender); }
}

contract Greeter is Mortal {
    /* Define variable greeting of the type string */
    string greeting;

    /* This runs when the contract is executed */
    constructor(string memory _greeting) public {
        greeting = _greeting;
    }

    /* Main function */
    function greet() public view returns (string memory) {
        return greeting;
    }
}
```

The Ethereum Virtual Machine — How does it work? | by Luit Hollander...

If you've tried developing a smart contract on the Ethereum blockchain, or have been in the space for a while, you might have come across the term "EVM", short for Ethereum Virtual Machine. Virtual...

<https://bit.ly/ETH-EVM-breakdown>

(17/23) After we understand what the EVM is, the next question is simple... in fact it has been hanging over us since tweet #7:

How do you get share one single instance of the EVM across multiple different computers... let alone the globe?

(18/23) The obvious solution is to just run a single copy of the EVM and let everyone log in. Maybe in an infinitely scalable cloud computing platform, maybe in a wholly-owned server farm maintained by the Ethereum Foundation.

Problem solved?

(19/23) Let's remember the EVM's 3 critical properties: compulsory (public) record keeping, immutable history and equal access.

If we run a centralized EVM, we can't guarantee any of these; we are always relying on the good faith of the people running the computers.

(20/23) Maybe the custodians are acting in good faith today, and maybe they continue in perpetuity, always doing their best effort to enact these properties.

Alas, regardless of how hard they try, they will always fail in the third. They will always have privileged access.

(21/23) Instead of centralizing the EVM, what if we did the opposite?

What if we let anyone access it by running a copy at home and then syncing it up to the rest of them? The blockchain provides a record of everything that happened so far, a fresh EVM can just catch up.

(22/23) Boot up the EVM, skip through the blockchain and you're good to go! The moment you're in sync, you're tapped into the World Computer!

...now how do we progress it forward? How do thousands of independent EVMs ensure they all make the exact same move at the same time?

(23/23) In 2008, Satoshi Nakamoto gave us a path forward, but it wasn't until [@VitalikButerin](#) launched [@ethereum](#) in 2015 that we had a true solution.

But that's a story for next time; the story of EVM consensus.

That's the magic of blockchain technology!

Like what you read? Help me spread the word by retweeting the thread (linked below).

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Ethereum Virtual Machine (EVM)



4:33 AM · Sep 27, 2022 

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