

21 Keys to Ethereum Ecosystem

Master the essentials of Ethereum ecosystem.

ETH



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BitMine Immersion (BMNR)

A blockchain technology company focused on digital asset mining and treasury management, holding the world's largest ETH treasury.

BitMine Immersion Technologies, Inc. (ticker: BMNR) is a blockchain technology company focused on industrial-scale digital asset mining, equipment sales, and hosting operations, primarily for Bitcoin and other cryptocurrencies. As of 2025, BitMine has pivoted to emphasize Ethereum treasury management, holding over 2.126 million ETH valued at approximately \$9.3 billion, making it the world's largest ETH treasury and the second-largest crypto treasury globally, behind Strategy (formerly MicroStrategy, MSTR).

It aims to maximize ETH per share through strategic holdings, staking for yields, and ecosystem participation. Supported by institutional investors like ARK Invest, BitMine's stock has surged 714% in six months, reflecting strong market confidence.

Consensys and Joseph Lubin

Consensys is a blockchain software studio founded by Ethereum co-founder Joseph Lubin, building enterprise tools and advocating for decentralized tech.

ConsenSys, founded in 2014 by Joseph Lubin, is a New York based decentralized software studio employing thousands globally to develop Ethereum tools like MetaMask and Infura. As Ethereum's co-founder, Lubin (an ex-Goldman Sachs) co-authored the Yellow Paper specifying the EVM and launched ConsenSys to foster an ecosystem around Ethereum's 2015 debut.

In 2025, Lubin's focus on Ethereum treasuries (e.g., SharpLink's \$400% stock rally post-ETH pivot) positions him as a corporate adoption advocate of Ethereum, akin to Michael Saylor for Bitcoin.

dApp (Decentralized Application)

A software application that runs on a decentralized network like Ethereum, leveraging smart contracts for backend logic.

A decentralized application (dApp) is a software application that operates on a blockchain, such as Ethereum, rather than centralized servers. Its backend code runs on a decentralized peer-to-peer network, typically using smart contracts to execute logic automatically and transparently. dApps are designed to be open-source, trustless, and resistant to censorship, with data stored on the blockchain to ensure immutability and security. Examples include decentralized finance (DeFi) platforms like Uniswap and NFT marketplaces like OpenSea, which rely on Ethereum's infrastructure for transactions and operations.

DeFi

Decentralized Finance (DeFi) refers to financial applications built on a blockchain that operate without centralized intermediaries, using smart contracts to enable trustless lending, borrowing, trading, and more.

Decentralized Finance (DeFi) on Ethereum is a category of blockchain-based applications that leverage Ethereum's smart contract functionality to provide financial services—such as lending, borrowing, trading, and yield farming—without traditional intermediaries like banks or brokers. DeFi protocols run on Ethereum's decentralized network, utilizing open-source code and transparent, immutable smart contracts to automate transactions, ensuring trustlessness and permissionless access.

As of 2025, Ethereum hosts over 90% of the DeFi ecosystem's total value locked (TVL), amounting to approximately \$150 billion across thousands of protocols, making it the dominant blockchain for DeFi. Key DeFi applications on Ethereum include decentralized exchanges (DEXs) like Uniswap; lending platforms like Aave; and stablecoin protocols like Sky(formerly MakerDAO), which issues DAI, a decentralized stablecoin pegged to the USD with over \$10 billion in circulation.

Despite its dominance, DeFi on Ethereum faces challenges, including smart contract vulnerabilities—exploits have caused over \$3 billion in losses since 2020—and layer-2 fragmentation, which can silo liquidity. However, innovations like account abstraction and cross-rollup bridges are improving user experience and interoperability. Ethereum's DeFi ecosystem continues to lead due to its robust developer community, open governance, and infrastructure, with platforms like Curve



optimizing yield generation and liquidity provision, solidifying
Ethereum's role as the backbone of decentralized finance.

DefiLlama

A free, transparent DeFi analytics platform aggregating total value locked (TVL) and metrics across blockchains.

DefiLlama is the leading TVL aggregator for decentralized finance (DeFi), tracking over \$280 billion in stablecoin market cap and protocol metrics like fees, revenue, and volume across 100+ chains. Launched in 2021 as an open-source alternative to biased trackers, it provides real-time dashboards for chains, categories (e.g., lending, DEXs), and protocols, enabling users to compare growth trends and performance without paywalls.

The platform's commitment to neutrality stems from its community-driven model under Llama Corp. It replaced predecessors like DeFi Pulse by expanding to perps volume and DEX rankings, helping investors spot trends such as \$5 billion weekly stablecoin inflows. DefiLlama's open-source ethos ensures transparency, with CSV exports and API access, making it indispensable for DeFi's future.

EigenCloud

Restaking protocol on Ethereum enabling staked ETH to secure additional services (Actively Verifiable Services, AVSs), now rebranded as a verifiable cloud for AI and compute.

EigenCloud, formerly EigenLayer and launched in 2023, is an Ethereum restaking protocol allowing staked ETH (or LSTs like stETH) to underwrite Actively Validated Services (AVSs) like oracles and bridges, unlocking yields up to 10%. Users restake via smart contracts for slashing-secured guarantees, with operators earning fees; it supports hundreds of assets and scales via EigenDA (data availability layer).

EIP (Ethereum Improvement Proposal)

A standardized process for proposing and implementing changes to the Ethereum protocol.

An Ethereum Improvement Proposal (EIP) is a formal document outlining proposed changes, enhancements, or standards for the Ethereum ecosystem.

EIPs cover protocol upgrades, smart contract standards (e.g., ERC-20, ERC-721), and network improvements (e.g., EIP-1559).

Submitted by developers or community members, EIPs undergo rigorous review, discussion, and consensus-building via GitHub and Ethereum forums. Once approved, they guide implementation, ensuring Ethereum evolves transparently and collaboratively to address scalability, security, or functionality needs.

Ethereum Foundation

A non-profit organization dedicated to supporting the development and ecosystem of the Ethereum blockchain without controlling it.

The Ethereum Foundation (EF) is a Swiss-based non-profit founded in 2014 for Ethereum, the decentralized blockchain platform launched in 2015. It allocates resources to critical projects, funds research, and advocates for Ethereum's long-term success, but does not control the network—development is driven by a global ecosystem of contributors.

Key initiatives include funding protocol upgrades like the Pectra hard fork (expected mid-2025), supporting client diversity to enhance decentralization, and backing tools like Geth (Go implementation) and Swarm (decentralized storage).

The EF has evolved into a learning organization adapting to Ethereum's growth, with a focus on scalability, security, and inclusivity. Historically, the EF emerged from Ethereum's early days, formalized after Vitalik Buterin's 2013 whitepaper and a 2014 crowdsale raising funds in Bitcoin. It coordinated the 2015 mainnet launch and has since supported upgrades like the 2022 Merge to proof-of-stake.

The EF also funds ecosystem grants, such as those for privacy tools and Layer 2 solutions, and maintains neutrality by not favoring specific implementations.

Ethereum.org

The official community-driven website serving as a comprehensive guide and resource hub for Ethereum users, developers, and builders.

Ethereum.org is the primary online portal for Ethereum, a global decentralized platform for money and applications, maintained by hundreds of community volunteers including translators, coders, and designers.

Launched alongside Ethereum in 2015, it provides accessible explanations of core concepts like smart contracts, proof-of-stake consensus, and the Ethereum Virtual Machine (EVM), alongside tutorials for building dApps, wallets, and DeFi tools.

Ethereum.org also promotes participation, from staking ETH for network security to joining DAOs, underscoring Ethereum's open, permissionless nature where anyone can contribute without permission.

Restaking (Ethereum PoS)

Restaking on Ethereum's Proof-of-Stake (PoS) enables staked ETH to secure additional protocols via EigenCloud (previously EigenLayer), earning extra rewards while extending Ethereum's cryptoeconomic security.

Restaking, pioneered by EigenCloud (formerly EigenLayer), allows Ethereum validators and liquid staking token (LST) holders to reuse their staked ETH to provide security for other decentralized services, known as Actively Validated Services (AVSs). Launc

hed in 2023 on Ethereum's mainnet, EigenCloud operates as a middleware protocol where users deposit native staked ETH (minimum 32 ETH per validator) or LSTs like stETH into smart contracts, delegating them to operators who run AVS nodes. This extends Ethereum's \$33+ billion in staked ETH to secure rollups, oracles, bridges, and data availability layers, reducing bootstrap costs for new protocols from millions in validator setup to renting Ethereum's pooled security.

Users earn compounded yields—base Ethereum staking APR of ~3.2% plus AVS-specific rewards in ETH, EIGEN tokens, or ERC-20s—potentially reaching 5-8% total, according to EigenCloud data and DeFiLlama TVL metrics showing \$17.51 billion restaked As of 2025.

Staking of Ethereum PoS

The process of locking up Ether (ETH) to participate in Ethereum's Proof-of-Stake consensus and earn rewards.

Staking in Ethereum's Proof-of-Stake (PoS) system, implemented after The Merge in 2022, involves locking up a minimum of 32 ETH in a validator smart contract to help secure the Ethereum network.

Stakers, or validators, are responsible for proposing and attesting to new blocks in the blockchain, ensuring transaction validity and network consensus. In return, they earn rewards in the form of newly issued ETH and transaction fees, typically yielding 2-5% annual percentage return (APR) as of 2025.

To stake, users run a validator node using an execution client (e.g., Geth, Besu) and a consensus client (e.g., Lighthouse, Prysm), requiring reliable hardware and internet to avoid penalties like slashing, where a portion of staked ETH is lost for malicious or negligent behavior.

Staking can be done solo, requiring technical expertise, or through staking pools (e.g., Lido, Rocket Pool) for those with less than 32 ETH or limited technical skills, though pools introduce third-party risks. Over 1 million validators are active as of 2025, with more than 33 million ETH staked, representing over 25% of Ethereum's total supply, per beaconcha.in, enhancing network security and decentralization.

EVM-Compatible Chain

A blockchain network designed to execute Ethereum Virtual Machine (EVM) bytecode, enabling direct compatibility with Ethereum smart contracts and tools.

EVM-compatible chains replicate the Ethereum Virtual Machine environment, allowing developers to deploy Ethereum-based decentralized applications (dApps) and digital assets without modifications.

Examples include BNB Chain and Polygon, which provide faster speeds and lower fees—often under \$0.01 per transaction—compared to Ethereum's mainnet, where costs can exceed \$1 during peak times. This compatibility supports standards like ERC-20 for tokens and ERC-721 for NFTs, fostering seamless cross-chain interactions.

As of 2025, over 50 EVM-compatible chains exist, collectively processing billions in daily transaction value, with Avalanche achieving up to 4,500 TPS through its subnet architecture. These chains enhance Ethereum's scalability by distributing load while maintaining bytecode-level equivalence for tools like MetaMask wallets.

Geth

An open-source Ethereum client software, written in Go, for running nodes, executing transactions, and interacting with the Ethereum blockchain.

Geth, short for Go Ethereum, is one of the primary client implementations for the Ethereum blockchain, developed by the Ethereum Foundation and community contributors since 2014. Written in the Go programming language, it allows users to run full or light nodes, mine ETH (pre-Merge), deploy smart contracts, and interact with the Ethereum Virtual Machine (EVM).

As of 2025, Geth remains the most widely used Ethereum client, powering approximately 74% of execution layer nodes, with version 1.14.11 (released August 2025) supporting the upcoming Pectra hard fork. It processes over 19 million daily transactions on Ethereum's mainnet, ensuring network security and decentralization.

Justin Sun

Chinese-born crypto entrepreneur and founder of the Tron blockchain, known for aggressive expansion and high-profile controversies.

Justin Sun, born July 30, 1990, is the founder of Tron, a blockchain platform launched in 2017 aimed at decentralizing content and entertainment via smart contracts. Sun has grown the network to over 308 million users and 10.4 billion transactions by 2025, with a personal net worth of \$12.5 billion largely in TRX, which he controls a majority of. Tron hosts 32% of global stablecoins, trailing Ethereum. Despite criticisms of centralization (e.g., TRX supply control), Tron's ecosystem thrives in emerging markets for cheap remittances, with Sun's bold moves driving adoption.

L2BEAT

An analytics platform tracking Ethereum Layer 2 scaling solutions, providing metrics on TVL, risks, and adoption.

L2BEAT monitors 50+ Ethereum L2 projects, displaying real-time data like \$40 billion total TVL and 1.2 million daily transactions As of 2025. It evaluates risks via stages (Stage 0-2), with only Arbitrum and Optimism at Stage 2 for full decentralization.

The open-source tool uses TypeScript for dashboards comparing sequencer uptime (e.g., 99.5% average) and upgradeability, aiding developers in assessing protocol maturity.

Lido liquid staking

Decentralized protocol enabling liquid staking of ETH, where users receive stETH tokens for rewards while maintaining DeFi liquidity.

Lido, launched in 2020, is Ethereum's premier liquid staking solution, allowing users to stake any ETH amount for stETH (representing staked ETH plus rewards), with 27% of total staked ETH under management as of 2025.

Staking yields ~3-5% APR (daily rewards from Day 1), with a 10% fee split between node operators (for 97.63% uptime) and DAO treasury; users get 90% of rewards. Over 30 independent operators, including home stakers via modules like Simple DVT (using Obol/SSV for risk reduction), ensure decentralization, with stETH tradable on DEXs like Curve for liquidity.

NFT and NFT Marketplace

Unique digital tokens (NFTs) on Ethereum representing ownership of art, collectibles, or utilities, traded on marketplaces like OpenSea and Blur.

Non-fungible tokens (NFTs) on Ethereum are ERC-721/1155 standard assets proving unique ownership of digital items like art or game assets, minted since 2015's Etheria project; marketplaces facilitate buying/selling with \$161 avg price across 80M+ items in 2025. Ethereum hosts 52+ platforms, led by Magic Eden (aggregating multi-market listings, cross-chain support) and OpenSea (4M+ sales, \$1.2K avg), using IPFS for immutable metadata. Blur dominates trading (pro-focused), while LooksRare rewards with LOOKS tokens; total volume hit \$25B+ in 2024 peaks.

Paradigm

Research-driven crypto venture firm investing in early-stage protocols, with open-source software contributions advancing blockchain infrastructure.

Paradigm, founded in 2018 by Coinbase co-founder Fred Ehrsam and Sequoia's Matt Huang, is a San Francisco-based investment firm managing \$2.5B+ in crypto funds, backing 28+ startups like Uniswap. By 2025, Paradigm's research arm publishes on-chain analyses, influencing trends like stablecoin rails, while its trading arm provides liquidity for 120+ derivatives across assets.

A core pillar is open-source software (OSS), with tools like Foundry (Ethereum testing framework used by 70% of devs) pushing crypto frontiers. Paradigm's dual investing-OSS model has yielded exits like Optimism, emphasizing long-term ecosystem health over quick flips.

Polygon PoS Chain

Polygon's proof-of-stake sidechain that parallels Ethereum, offering high-throughput transactions secured by its own validators.

Polygon PoS Chain, launched in 2020, is an EVM-compatible sidechain using proof-of-stake consensus with 100 validators staking over 1.9 million POL(formerly MATIC) tokens as of 2025. Unlike true Layer 2 rollups, Polygon PoS operates independently.

RWAs

Real-world Assets tokenized on blockchain for fractional ownership, liquidity, and transparency, bridging traditional and decentralized finance.

Real-world Assets (RWAs) refer to physical or traditional financial assets (e.g., real estate, bonds, commodities) tokenized on blockchain for fractional ownership, liquidity, and transparency. Tokenization bridges TradFi and DeFi, enabling global access to assets via blockchain and smart contracts. RWAs use oracles for off-chain data integration, supporting use cases like lending and yield farming, though challenges include regulation and custody.

Driven by stablecoins and treasuries, its market size is over \$230 billion in 2025. RWA tokenization transforms tangible and intangible assets—such as real estate, commodities, art, or intellectual property—into tokens, allowing investors to own fractions of high-value assets with reduced transaction costs and increased transparency.

For example, a \$10 million property can be tokenized into 10,000 shares, tradable on decentralized platforms. Bond tokenization involves issuing fixed-income securities, like corporate or government bonds, as digital tokens, streamlining settlement, reducing intermediaries, and enabling 24/7 trading on blockchain networks like Ethereum or Solana.

Stablecoins on Ethereum

Digital assets pegged to fiat currencies like USD, issued on Ethereum for stable value transfer, DeFi collateral, and global payments.

Stablecoins on Ethereum are ERC-20 tokens maintaining a 1:1 peg to assets like USD through reserves or algorithms, powering over \$142.85 billion in market cap As of 2025. Ethereum hosts 54% of the \$280 billion global stablecoin supply, up from \$140 billion in 2023, driven by USDT (49.25% dominance, \$112B cap) and USDC. Key issuers include Tether and Circle.

Use cases span remittances (e.g., UN aid saving millions in fees) to tokenized funds, with Ethereum's 19M daily transactions underscoring its role as the "digital dollar" backbone.

