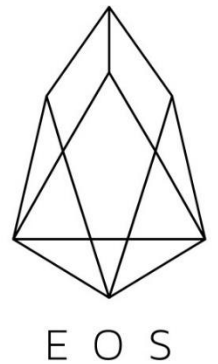


# Deep Dive into EOS

Platform for building decentralized applications

December 14, 2018



# What is EOS?

- A blockchain-based development platform designed for building decentralized applications (dApps). Developers can write and deploy smart contracts that power dApps and decentralized autonomous organizations (DAOs).
- The platform has a native token with the ticker EOS. EOS tokens were first released as an ERC20 token on the Ethereum blockchain, but a main-net token swap occurred after EOS Version 1.0 was deployed in June 2018.



# What is EOS? (continued)

- Often referred to as a decentralized operating system, where holding tokens represents a proportional share in the network bandwidth, storage, and computational resources. DApp developers must stake a certain number of tokens (called RAM) to cover the resources used by their dApp, but they receive those tokens back if the dApp is taken down.
- Because of this staking model, users can interact with and use dApps for free. There are also no transaction fees on the EOS network, and block producers earn rewards from newly minted tokens.

# What is EOS? (continued)

- EOS was developed and launched by the software company Block.one, who released the software as free and open source.
- The platform incorporates 3 major features.
  - **Scalability** – To support thousands of commercial scale dApps, facilitate inter-blockchain communication, and separate authentication from execution.
  - **Flexibility** – Ability to freeze and fix faulty or bug-laced dApps, generalized role-based permissions.
  - **Usability** – Web toolkit for interface development, self-describing interfaces, declarative permission scheme.



## FLEXIBLE

Freeze and Fix Broken Applications  
Generalized Role-based Permissions  
Web Assembly



## USABLE

Web Toolkit for Interface Development  
Self Describing Interfaces  
Declarative Permission Scheme



## SCALABLE

Supports thousands of Commercial Scale  
DApps  
Inter-blockchain Communication  
Separates Authentication from Execution

# Consensus mechanism

- The EOS blockchain uses a **Delegated Proof of Stake (DPoS)** consensus mechanism with 21 block validators and integrated Byzantine fault tolerance.
- Delegated Proof of Stake is a consensus mechanism where blocks are validated by a pre-selected group of nodes and it allows for high transaction throughput.
- **Byzantine fault tolerance** is the ability of a network to handle situations where nodes go down or malicious nodes broadcast faulty information.
- EOS is theoretically Byzantine fault tolerant because 15 out of the 21 block producers are required to confirm a transaction (a 2/3 majority).

# Consensus mechanism (continued)

- EOS transactions are typically confirmed within 1 second with a 99.9% certainty, as a new block is created every 0.5 seconds. Dan Larimer stated in an April 2018 blog post that EOS can theoretically support over 1,000 transactions per second and aims to scale to 6-8,000 transactions per second in the future.
- EOS also implements a mechanism called **Transaction as Proof of Stake (TaPoS)**, where every transaction must include part of the hash of a recent block header. TaPoS makes it difficult to forge counterfeit chains considering the counterfeit chain would not be able to migrate transactions from the legitimate chain.

## EOSIO Dawn 3.0 Now Available



Daniel Larimer [Follow](#)  
Apr 5 · 13 min read



Block.one is excited to announce the first feature-complete pre-release of EOSIO, Dawn 3.0. This pre-release represents a major milestone on the road to EOSIO 1.0 targeted for release in June 2018. Our world wide team of developers have been working around the clock to make EOSIO the most powerful platform for building blockchain applications. It has been four months since we released EOSIO Dawn 2.0 and we have a lot to show for it.

Building state of the art blockchain architectures is a process where designs change as we learn. Many of the features we have completed in Dawn 3.0 were not even contemplated in the original EOSIO White Paper, but were

# Key features

- **DPoS consensus mechanism**
- **Parallel processing:** The ability to do things in parallel on the EOS network allows for faster transaction speeds and more scalability. This is planned for implementation in future versions of EOS.
- **Network flexibility:** If a DApp is faulty and contains a critical bug, the elected block producers can freeze it until the issue is resolved.
- **High transaction throughput:** EOS can theoretically support over 1,000 transactions per second with hopes that the platform can scale even higher.

# Key features (continued)

- **Ownership model:** Owning EOS tokens represents a proportional share of the network resources like bandwidth, storage, and processing power. Developers must prove they hold a sufficient number of tokens to create DApps on the EOS blockchain.
- **No transaction fees:** Sending EOS tokens to another user or using them for a DApp requires no fee.
- **EOS Constitution:** The Constitution is a multi-party contract entered into by members of the EOS ecosystem by virtue of their use of the platform. The Constitution has 18 articles that outline the rules and user rights governing the EOS blockchain.



# Key milestones

## 1H 2017

Jun: EOS Technical White Paper released.

Jun: Draft of the EOS token sale smart contract released.



## 2H 2017

Sep: EOS.IO Dawn 1.0 released – the first release of the EOS.IO software development kit (SDK).

Dec: Dawn 2.0 released.



## 1H 2018

Jan: Block.one and Galaxy Digital announced JV for \$325M fund.

Apr: Dawn 3.0 released. Block.one signed a \$200M JV partnership.

May: Dawn 4.0 released.

Jun: V1 of open source blockchain software released and EOS Developer Portal went live. EOS main-net launched.



## 2H 2018

Jul: EOS Version 1.1.0 released.

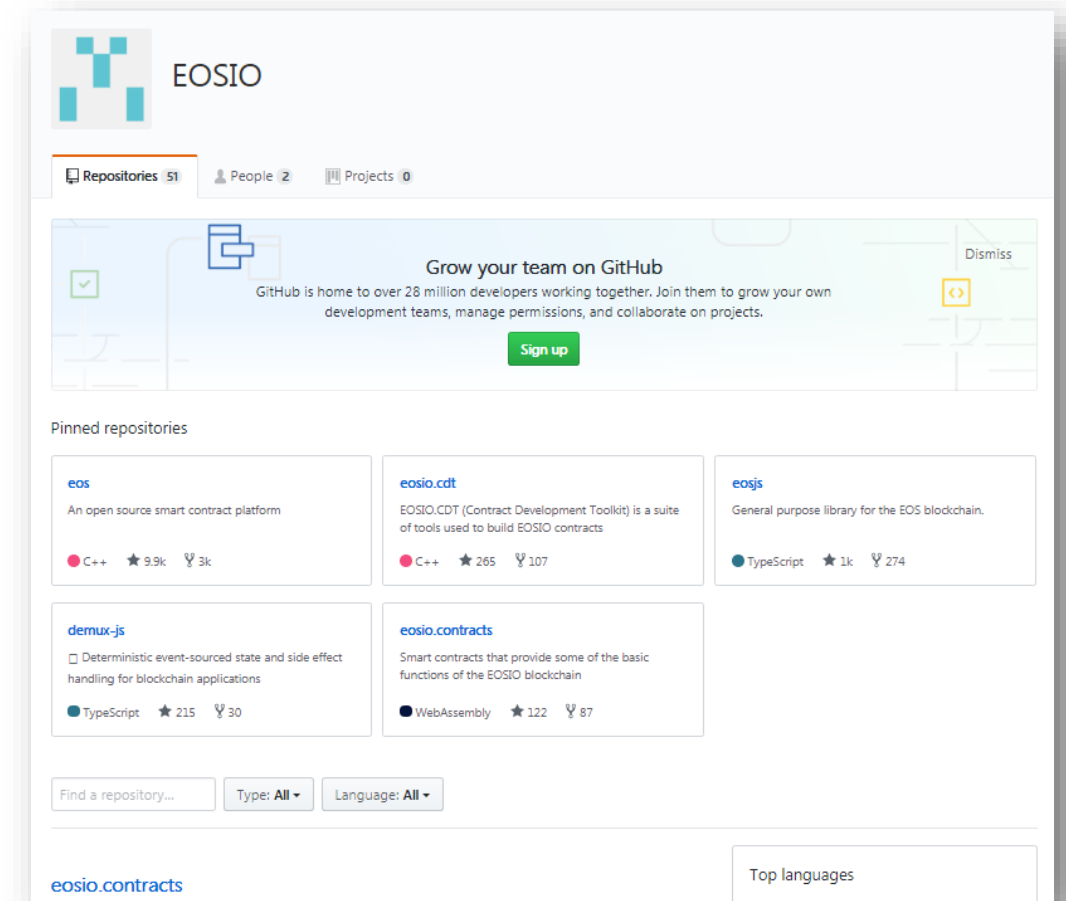
Aug: EOS Version 1.2.0 released.

Sep: EOS Version 1.3.0 released.

Oct: EOS Version 1.4.0 released.

# Future development

- Block.one has committed to investing over \$1 billion into projects focused on growing the EOS ecosystem through their venture capital firm EOS VC.
- They also host EOS hackathons around the world and fund prizes for the winning projects.
  - Projects can receive more information about EOS VC and find an application link here: <https://vc.eos.io/about-eos-vc>
- There is no updated roadmap for the future technical development of EOS.

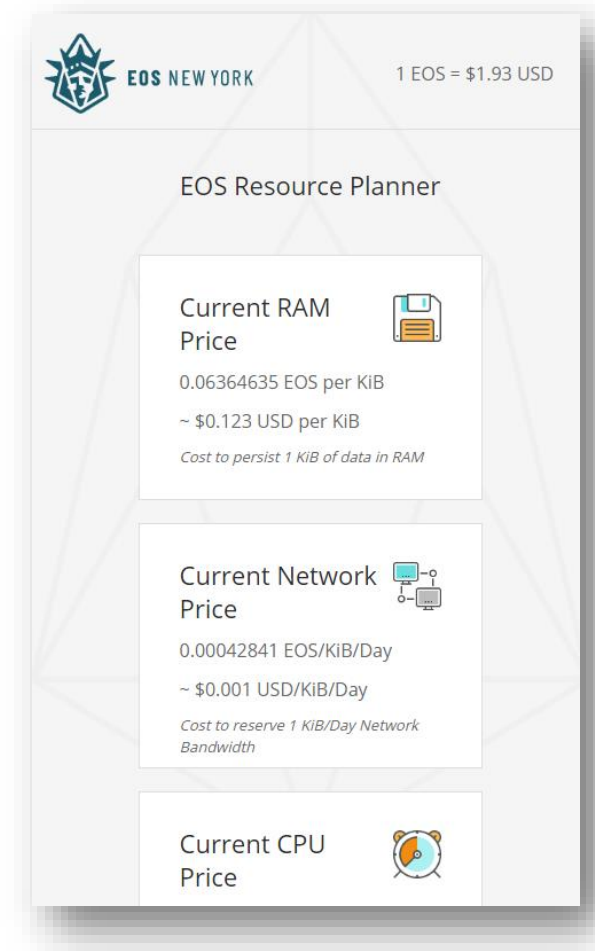


# Token economics

- The EOS blockchain has a native token called EOS.
- EOS tokens represent a share in the platform's resources – this includes bandwidth, storage capacity, and processing power.
- Developers who wish to build dApps that run on the EOS blockchain must prove they hold a certain number of tokens and then stake those tokens to deploy the DApp.
- Application developers must stake tokens to cover the nominal cost of account creation to sign up new users for their DApp.
- In addition, they must stake tokens for any storage, CPU power, or bandwidth used by the user. If the developer takes the DApp down, they receive their staked tokens back.

# Token economics (continued)

- Developers can refer to the EOS Resource Center for up-to-date staking cost calculations.
- Baseline costs as of December 7, 2018:
  - Cost for 1KiB of data in random access memory (RAM): 0.063 EOS (~\$0.122 USD)
  - Cost to reserve 1 KiB of network bandwidth per day: 0.00043303 EOS (~\$0.001 USD)
  - Cost to reserve 1 MS of CPU bandwidth per day: 0.20370257 EOS (\$0.369 USD)
- There are no transaction fees on the EOS blockchain. The inflation rate was initially set at 5% upon main-net release, which may be updated in the future but will not exceed 5%.



# Team and advisors



**Daniel Larimer**  
CTO

Specializes in software development and has founded prominent technology companies including BitShares, Steemit, and Block.one. Inventor of DPoS and Decentralized Autonomous Corporation (DAC) concepts, and has been involved with blockchain technology since 2009.



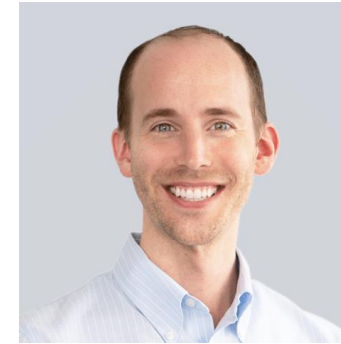
**Brendan Blumer**  
CEO

Founded Gamecliff in 2001, a company that automated the valuation, purchase, and resale of in-game video game items. He also founded okay.com, a data-sharing ecosystem that is now Hong Kong's largest digital property agency. He is an early investor in blockchain technologies and co-founded Block.one with Dan Larimer.



**Rob Jesudason**  
President

Prior to Block.one, he was the CFO of Commonwealth Bank of Australia, Head of Global Emerging Markets for Credit Suisse, and held various positions at JPMorgan, Barclays, GE Capital etc. He is a member of Block.one's Board of Directors and is responsible for group global operations.



**Andrew Bliss**  
CFO

A financial professional, investor, and entrepreneur that has served as the CFO of Block.one since its inception. Prior to Block.one, he held financial and accounting positions with Rockwell Collins, where he worked for just under a decade.

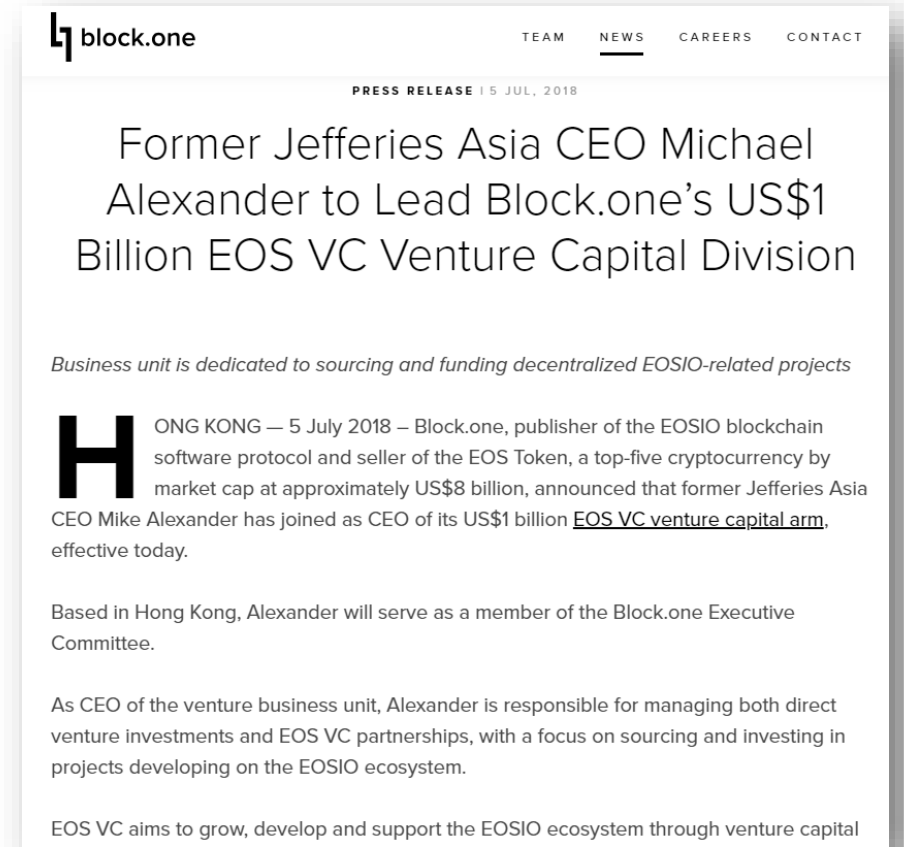


**Michael Alexander**  
CEO (EOS VC)

25+ years of experience in Asia capital markets. He was the CEO of Jefferies Group Asia, Head of Sales and Sales Trading at CLSA Hong Kong, Head of Proprietary Trading at JPMorgan Hong Kong, etc. He is responsible for direct venture investments and EOS VC partnerships for Block.one.

# Strengths

- EOS has a huge war chest to fund dApps to build on the network. It was announced that EOS VC has \$1 billion, although the number should be lower now that EOS price has dropped substantially.
- Unlike most of the other popular blockchain platforms, users do not need to pay transaction fees on EOS. This is good in terms of user experience.
- EOS uses the WASM virtual machine, which supports different popular programming languages like C, C++, and Rust. This makes it easier for developers to build on the platform.



The screenshot shows a press release from Block.one dated July 15, 2018. The headline reads: "Former Jefferies Asia CEO Michael Alexander to Lead Block.one's US\$1 Billion EOS VC Venture Capital Division". Below the headline is a sub-headline: "Business unit is dedicated to sourcing and funding decentralized EOSIO-related projects". The main text begins with "HONG KONG — 5 July 2018 – Block.one, publisher of the EOSIO blockchain software protocol and seller of the EOS Token, a top-five cryptocurrency by market cap at approximately US\$8 billion, announced that former Jefferies Asia CEO Mike Alexander has joined as CEO of its US\$1 billion [EOS VC venture capital arm](#), effective today." It further states that Alexander will serve as a member of the Block.one Executive Committee and is responsible for managing both direct venture investments and EOS VC partnerships, with a focus on sourcing and investing in projects developing on the EOSIO ecosystem. The final line of the press release states: "EOS VC aims to grow, develop and support the EOSIO ecosystem through venture capital".

# Strengths (continued)

- The DPoS consensus mechanism used by EOS enables a high transaction throughput, meaning users can see their transaction confirmed almost instantly. It is significantly quicker than most decentralized proof-of-work blockchains and allows for scalable use of dApps.
- Flexibility – one bug in a dApp will not render it useless or impact the health of the network. The 21 block validators can freeze the application and allow developers to fix any issues before it goes live again.
- Developers must stake EOS tokens to pay for storage, bandwidth, and computational costs associated with smart contracts/dApps, and receive the tokens back if they take the dApp down.

# Weaknesses

- With transactions being free, users can easily spam the network without much cost.
- It is not easy to create an EOS account to use the token and it requires a fee. This creates friction in user adoption.
- The number of Block Producers for EOS is relatively low at 21. This leads to a considerable amount of centralization, with each block producer holding a significant amount of influence over the network. EOS cannot compare to the level of decentralization associated with other blockchains like Bitcoin or Ethereum.
- The governance of EOS heavily relies on voting but the participation rate among token holders is low, which may lead to ineffective governance.
  - Even the vote for launching the EOS mainnet took a week before reaching the 15% threshold. The threshold was reached only when exchanges voted on behalf of customers' EOS deposits on exchange.



# Weaknesses (continued)


- The Huobi voting collusion scandal highlights the weakness of a DPOS system.
  - The rewards for being a super node is substantial. With EOS at \$2, the top block producers earn over \$500,000 per year with minimal operating expenses. This incentivizes Block Producers to use various tactics to maintain their status.
- Dan Larimer has a tendency to leave projects and move onto the next one. Steemit, one of his previous projects, recently announced that it would lay off 70% of its staff.
  - Although Dan said that he is not leaving EOS, he is indeed thinking about a new blockchain focusing on currency. The market is concerned because of his previous history of leaving unfinished projects.

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CRYPTO NEWS

## Rampant Collusion in EOS Exposed by Huobi Leak

September 29, 2018 9:45 am



A spreadsheet has been leaked, allegedly authored by Shi Feifei, a Huobi employee. Titled "Huobi Pool Node Account Data 20180911," the document details mutual voting and sharing of proceeds from producing blocks in EOS.

The document shows Huobi votes for 20 Block Producers (miners) in EOS with 16 of them voting for Huobi in return.

大市投票节点 节点名称	9月4日		9月5日		9月10日	
	大市投票数	对方投票数	大市投票数	对方投票数	大市投票数	对方投票数
esrhuobipool	1400		1400		1400	
starteosiebp	1000	1300	1000	1300	1200	1400
zhoosb11111	1400	1600	1400	1600	1400	3706
esoflytcars	700	678	700	678	1700	2142
esstatopred	200	456	200	440	280	484
bitfinereos1	1000	4760	1000	4760	1000	4800
esogenblockp	1400		1400		2000	
esocannoncha			600	1490	1100	2007
esofishlocks	300	318	300	318	300	498
esstatorebest	400	200	700	200	700	200
esbeijingbp	600		600		600	

POPULAR

# Weaknesses (continued)

- Block.one claims the EOS network is flexible as faulty dApps can be frozen while the bugs are fixed. However, this same power allows for the Block Producers to reverse transactions that have been previously confirmed.
- Essentially any holder of EOS who has not made a transaction within 3 years can have their tokens taken away. This signals more centralization and sets a dangerous precedent.
  - Quoting article XVII of the EOS Constitution: "After 3 years of inactivity an account may be put up for auction and the proceeds distributed to all Members by removing EXAMPLE from circulation."
- The defining feature of success for smart contract platforms like EOS is building a strong developer community. EOS is significantly behind Ethereum and other platforms and will have to recruit and retain blockchain developer talent to catch up to or surpass Ethereum.

# Our conclusion

## Overall rating: C

- EOS sacrifices decentralization and permissionless to build a high-performance dApp platform. It has potential to succeed if more blockchain developers begin to migrate to EOS, but a lot has to be done before that happens. We could see EOS being used for certain use cases that do not require maximum censorship resistance that need high scalability.
- There are quite a lot of activities on the EOS blockchain, with the most active dApps being BetDice (over 6 million transactions in the last 7 days) and Royal Online Vegas (over 4 million transactions in the last 7 days). However, because EOS transactions are free, it is hard to see whether the transaction number is inflated or not.

# Our conclusion (continued)

- EOS is behind when compared to other platforms such as Ethereum. According to Dapp Radar, there are 160 deployed EOS dApps compared to 1,216 for Ethereum.
- Being a young blockchain platform, EOS relies on the founding team to work on the project and deliver on the project's vision. However, Dan Larimer's recent comments on a potential new project does not bring confidence to the market.
- There are flaws in the design of the governance system of EOS, as shown in the Block Producer voting scandal. This shows that the selection of Block Producers may need to include things other than just voting with EOS tokens. Without a careful design, we believe that DPoS systems are prone to be manipulated.

***CrushCrypto***