



The Decentralized Computational Network

Blockchain-as-a-Service solutions built on the blockchain

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Table of Contents

Introduction	3
Executive Summary	3
Unresolved Blockchain Needs	3
Why blockchain needs the Flux Ecosystem	4
Flux Ecosystem & Core Modules	5
The Flux Asset	5
Table 1: Flux chain parameters	5
FluxNodes	6
Table 2: FluxNode requirements	7
Table 3: Flux block reward distribution	7
Flux Operating System	8
Zelcore Custody Platform	10
FluxLabs	11
Flux Economics	12
Parallel Assets	12
Official Links	13
Social Media	13
Exchanges	13
Trackers	13
FluxNode Resources	13

Introduction

This paper provides an in-depth description of the Flux Ecosystem and its novel subcomponents which are released or pending future release. The Flux Team aims to make this paper accessible to everyone by providing non-technical summaries of the entire ecosystem. Individual technical papers for each project component are in-process and will be released as they become available.

Note: *Flux started life as “Zelcash”, or simply “Zel”. This project was rebranded to the Flux nomenclature March 27th, 2021. There are possible places in code, literature, and publications that still reference “Zel”.*

Executive Summary

The Flux Ecosystem is a suite of decentralized computing services and blockchain-as-a-service solutions which offer an interoperable, decentralized, AWS-like development environment. Flux utilizes a native POW (Proof of Work) coin to power this ecosystem, providing incentive for hardware hosters, governance on-chain, and bad actor mitigation via staking requirements for running hardware. The Flux operating system runs on top of Linux to provide the network with verified and benchmarked high-availability compute power and utilizes the blockchain to ensure transparency in governance operations. Flux node operators can choose from three tiers of hardware requirements to stand up after providing the necessary Flux capital soft-locked in their wallet. *This allows anyone to be rewarded for providing hardware to the network, from anywhere in the world.*

Unresolved Blockchain Needs

Ignoring the overwhelming number of blatant Bitcoin/currency and Dash/masternode projects that litter the space without contributing new features or ideas, there is still a huge number of projects aiming to solve a small handful of blockchain problems. Competition between projects to solve the same problem is always healthy, but this can negatively impact the speed of new emerging technologies being introduced to the world. The next generation of blockchain technology requires answers to these problems along with a set standard approach to implementing the technology and package its use into a digestible set of tools for current and future developers.

Flux has built these necessary development tools to speed up the usage of blockchain solutions through creating real-world use cases and the underlying technologies necessary to build these products and platforms. The Flux Ecosystem has a plethora of current and future technologies to offer the world, and we are always working on adding more features to our offering through partnerships with other crypto projects in the space via strategic partnerships and our FluxLabs incubator (see below). With these partnerships, we will help speed up delivery of *usable* blockchain products to the masses in easy-to-use applications

and products. Projects that are currently working on single, large-scale blockchain problems can save time and resources by leveraging the Flux Network for scalable, decentralized enterprise-grade hardware resources to allow them to focus on their own projects. Partnerships will also help bring together the fractured crypto space to create an ecosystem of complementary products that work seamlessly together.

All blockchain teams and believers are in this together, building a new and exciting digital infrastructure to support the future.

Why blockchain needs the Flux Ecosystem

We believe Flux is vital to the blockchain space as it provides critical infrastructure, development tools, and industry experience necessary to quicken the pace of blockchain solution rollouts. There are many modules to the Ecosystem, which are detailed below, that offer novel and easy-to-use products for both developers and consumers. By building a complete portfolio of blockchain resources, new technologies can emerge faster with more real-world use cases and advanced features so that crypto can continue its growth towards mainstream usage. Flux allows us to build our own novel blockchain products, for strategic partners to leverage computing power and services they require to thrive, and for independent blockchain developers to launch their ideas efficiently and effectively.

Flux is a native crypto asset with its own blockchain.

There are Flux "parallel assets" to allow the Flux governance coin to function on all DeFi protocols including Kadena, Binance Smart Chain, Ethereum, Tron, and more, over time.

Flux Ecosystem & Core Modules



- Secure blockchain
- Parallel assets
- Empowering

Governance POW coin & distributed ledger

Flux is a fair-mined, proof-of-work cryptocurrency that acts as a utility asset for onboarding to the Ecosystem and powering the transaction of information across the Ecosystem. The asset also acts as the main incentivization for operating a FluxNode: enterprise-grade server hardware powering the Ecosystem. Flux can be attained via GPU mining, trading on available exchanges, and as rewards for operating nodes. Our Ecosystem is a community-based project with a foundation that represents the community's voice and protects the community's wishes for the project.

Flux is a fork of Zcash. Our team strives to implement the necessary security and performance improvements from Zcash to stay lock-step with the Zcash team as Flux continues to commit its own improvements to the codebase. The basic coin parameters for Flux are:

Table 1: Flux chain parameters

Mainnet launch	Jan 31st, 2018	Emissions [Halving]	2.5 years
Block reward	150 [at launch] 75 Flux [now]	Mining algorithm	FluxHash [EquihashR 125_4]
Block time [TTF]	120 seconds	Reward ratio [POW/nodes]	50/50
Consensus type	Proof of Work	RPC/P2P ports	16124/16125

Other major differences of Flux from Zcash is our commitment to remaining ASIC-resistant by continually changing the POW algorithm to stay ahead of ASIC/FPGA¹ development and the addition of the FluxNodes layer, outlined below.

The critical need for the Flux distributed ledger is to provide a complete and efficient asset that can operate seamlessly with every module in the Ecosystem. Flux gives the Ecosystem its own master transparent ledger, recording necessary transactions of data within the Ecosystem while also acting as a currency to purchase services and cover required transaction costs for 3rd party application interactions. The Flux asset provides a complete set of utility-based functionality for users to interact with our products.

¹ Algorithm swapping would only pertain to ASIC/FPGA development that was vastly more efficient than CPU/GPUs, which has typically been the case in the past.

Another critical aspect is it provides a level of control that is required for the Ecosystem to function properly. One example is the rewards aspect for operators running FluxNodes. They are incentivized by collecting Flux, else there would be no network. As the project and network grow, the value of Flux will more than likely increase as its utility is leveraged by projects with new use cases. In order to scale the network, the required collateral and hardware specifications for running a node will likely change to meet demand, and the utility of Flux allows the project to adjust the network accordingly, with the involvement of the community. This adjustment could look something like doubling the hardware requirements and halving the collateral requirements to scale the network without requiring operators to acquire more Flux (this is a simplified example for explanation).

Flux will also be the highly-encouraged currency for commerce on the network. The team plans to accept major cryptocurrencies and fiat, but customers using Flux to purchase distributed computing power will receive substantial discounts. We have decided to not exclusively require Flux as that tactic artificially locks out a large number of potential users, such as businesses and individuals who require computing services but are not conducting their business in crypto assets.



- Always on
- Massively Scalable
- Earn Yield

Incentivized Distributed Enterprise Hardware

FluxNodes are what really differentiate Flux from other crypto projects. There are many projects that offer “masternodes” via low-powered nodes that process transactions. FluxNodes turn this idea on its head by requiring highly-available, enterprise-grade hardware, along with sufficient Flux collateral, to operate on the network and provide real, useful computing power to the network. Operating a FluxNode is also available to anyone with the required Flux and hardware, making the network actually decentralized both in who can run a node and the geographic location of the nodes. At the time of writing, there are over 1100 FluxNodes in operation across hundreds of operators and the globe.

The concept of FluxNodes emerged from a discussion about how to positively scale a decentralized application, development, and smart contract network, such as Ethereum. Projects like Lisk, Neo, and others have been able to do so, however they face considerable consolidation away from being decentralized, instead only offering nodes and development tools to a limited group. This consolidation of ownership also hampers scalability considerably, as evidenced by Ethereum’s multi-year endeavor to figure out how to get above 25 TPS (Ethereum is aiming at upwards of 1 million TPS, so it could be a slow road). With FluxNodes, the goal has always been to have thousands of potential nodes operating on the network, allowing anyone to participate and solve the scalability issue through available raw processing power.

There are three tiers of FluxNodes with different levels of required collateral and hardware specifications, outlined below.

Table 2: FluxNode requirements

Node requirements & names	Cumulus Node	Nimbus Node	Stratus Node
vCores	2+	4+ 200+ EPS	8+ 400+ EPS
RAM	4+ GB	8+ GB	32+ GB
Storage	50+ GB	150+ GB SSD 160+ MB/s write speed	600+ GB SSD 160+ MB/s write speed
Bandwidth	>25mbps up/down	>50mbps up/down	>50mbps up/down

EPS = events per second, a simple CPU benchmarking function.

In order to create a functional, highly-available decentralized network, Flux needs more than just the hardware. The following sections discuss the software side of FluxNodes, and how these components will work together to create a complete blockchain solution development platform.

FluxNodes are only made possible by the Flux operating system, running as a second-layer stack on top of Ubuntu/Debian

Table 3: Flux block reward distribution





- Guaranteed performance
- Docker built-in
- Load-balanced

Orchestrator, scheduler, hardware verifier

Flux is the “brain” of the FluxNodes and the Flux Computational Network. It is an open-source MEVN stack built from scratch by the Flux Team which acts as a second layer operating system to complement the base Linux OS running on all FluxNodes. An operational network of decentralized computing power is one of the core modules to the Flux Ecosystem, providing the ability for Flux and 3rd party developers alike to run their applications on a fair-priced network with no single point-of-failure. Since FluxNodes are operated in a decentralized manner by individual Flux holders, and geographically-spaced all over the world, developers can rest assured that their applications are accessible by users at all times and locations. Deployment of applications, websites, databases, etc. will rely on “dockerization” with our current strategy. The advantages of Docker apps are discussed below.

Flux acts as the master coordinator for launching dockerized applications, sidechains, and asset layers. It handles the deployment of the apps, manages the resources of each FluxNode to balance hardware usage, and communicates between the FluxNodes to provide real-time computing metrics. This connectivity also helps ensure each FluxNode is meeting the minimum system requirements by active benchmarking to ensure fair operator rewards and a robust decentralized network. If you are familiar with Docker, Kubernetes, and other container-type platforms, then you’ll feel at home with the Flux Computational Network. Flux then gives Docker app builders the ability to deploy their applications onto the Flux Network at a lower cost to the developer than renting virtual or dedicated servers.

The Flux Team chose to build Flux from the ground up to provide software that was perfectly tailored to the FluxNodes Network, which will allow for faster iterative development, easier maintenance of the codebase, and a wider range of community contributions to the project by enabling JavaScript developers to take part. This ease-of-use approach will greatly assist quick deployment of sidechains, asset layers, 3rd party apps, smart contracts, basically anything that can be built into a container. All this is achievable using a relatively new concept of the MEVN stack mentioned above, which consists of **MongoDB** (popular databasing program), **Express** (web framework in JS), **Vue.js** (framework for JS applications), and **Node.js** (cross-platform JS runtime environment). Along with Docker for containerizing applications, almost any developer can create an application that will run smoothly on the FluxNodes Network.

Each FluxNode will have a standardized web portal/GUI, viewable on the web, but with locked down access from unauthorized entry by utilizing ZelID. Only authenticated users can access the Admin privileges by logging into their FluxNode using Zelcore. When a user attempts to log into a FluxNode, a signed message is generated by Zelcore and sent to the

FluxNode for authentication and only authenticated ZelID's can be granted access. These authorized users (FluxNode operators) will also be able to update the Flux Daemon and Flux from the web portal, so no more needing to log into your server and running code/scripts to update to current releases, just click a button.

Flux leverages a tiered-privilege API system, allowing it to lock down access to FluxNode and daemon functions that should not be open to the public. Locking down access by user type allows the Network to be utilized by developers and app users without compromising the security and stability of the FluxNode itself. There are 4 levels of privileges currently employed by Flux:

1. Public level — no sign-in required, provides very basic API access to public chain information.
2. Zelcore User — requires a signed message from any ZelID, this level is made available for future services that would require a ZelID/Zelcore wallet to access.
3. Flux Team User — requires a signed message from a unique set of ZelID's, locking out the standard user. This level is critical for allowing the decentralized network to choose deployment requirements and manage FluxNode resources.
4. FluxNode Owner/operator — Top level privilege only accessible with a signed message from the owner's ZelID. Owner can update their node software and future privileged commands/information, including assigning privilege to other Zel ID's at owner's discretion.

HTTP requests via URL to access daemon RPC are protected by this tiered-privilege hierarchy. This is one major difference of Flux vs. other RPC-over-HTTP or Bitcore solutions in that the FluxNode is protected against malicious calls to the daemons and server hardware.

This foundation laid out by Flux allows deep integration of the Flux chain. The daemon is accessible via API commands in the URL bar; some informational commands are open to the public, such as validateaddress, while commands to generate a transaction or query more private commands are locked down to the authenticated ZelID's. Integrating the Flux daemon with Flux allows the computing network to seamlessly interact with the chain p2p network and provide a foundation for interacting with future sidechains, smart contract platforms, and asset layers.

More technical details and developer resources will be discussed in a supplementary blackpaper focused solely on the Flux Computational Network. Release of blackpaper is TBD.



- Wallet for all your assets
- Desktop & Mobile
- DeFi gateway

Perfectly integrated with Flux

Zelcore is the multi-asset crypto wallet and platform. It offers custody management of over 250 cryptocurrency assets, along with over 25,000 digital assets on the Ravencoin, NEO, and Ontology asset layers. Zelcore also offers built-in trading services of major centralized exchanges (Binance, Kraken, Bittrex) and quick-swap services (CoinSwitch, InstaSwap, Changelly, Kyber, etc.). This allows users to mine, store, transact, and exchange a huge number of crypto assets within the same secure, easy-to-use application.

Zelcore is available for Windows, MacOS, Linux, and mobile versions for iOS and Android. Upgrading and maintenance of Zelcore is made easy by having a single codebase for each device type and has a strong team of beta testers checking each release.

The platform utilizes a unique accounts system scheme based on a username and password combination, secured by salts and additional security features. The username/password scheme was chosen to provide convenience for the end user compared to other wallets that rely on impossible-to-remember combinations of random words or characters. These mnemonic setups are very secure but not convenient enough to act as the login for people who use their crypto wallets every day. To secure Zelcore's username/password approach, additional layers of security are available including second-layer passphrases and biometrics, and our unique decentralized two-factor authentication system. This entire identification and authentication platform is called ZelID, described below.

Zelcore acts as a frontend for the Flux Ecosystem. The Zelcore Team is always adding new assets and features for users, and as more Ecosystem modules roll out, Zelcore will allow users to interact with these features. Some examples are: creating metrics dashboards for FluxNode operators, a digital marketplace for apps and services running on FluxNodes, and a payments gateway for purchasing computing services on the network.

Upcoming features include aggregated crypto and fiat-ramp pricing with transparent costs, native integration of the upcoming Kadenaswap decentralized exchange, yield and staking for Flux and other assets, addition of lending protocols and next-gen smart contract negotiations.



- Industry experience
- Networking
- Complete toolset

Novel partnerships & project incubator

FluxLabs is an incubation and acceleration program of Flux Technologies for blockchain and technology-based projects with a focus on early stage start-ups in the emerging blockchain and cryptocurrency industries. The program focuses on three main functions:

1. Beneficial specific use-case and adoption in the blockchain and cryptocurrency space,
2. Structured brainstorming workshops, community events, and raising awareness of both Flux and FluxLabs projects together,
3. Facilitate connections with like-minded projects and co-marketing for new technologies and partnerships.

FluxLabs specifically focuses on projects that add beneficial and functional technology to the blockchain space. All projects invited to join FluxLabs incubation program need to be operational in full developmental phase and have a reviewable business model. FluxLabs is creating one of the best communities and networks of blockchain technology entrepreneurs, experts, mentors and investors. This network is leveraged to support and develop startups in growing their business, strengthening their commercial presence and increasing outreach and competitiveness in local, regional and international markets. The Flux Ecosystem benefits from each and every partnership as diverse technologies are adapted for and integrated into the Flux Project.

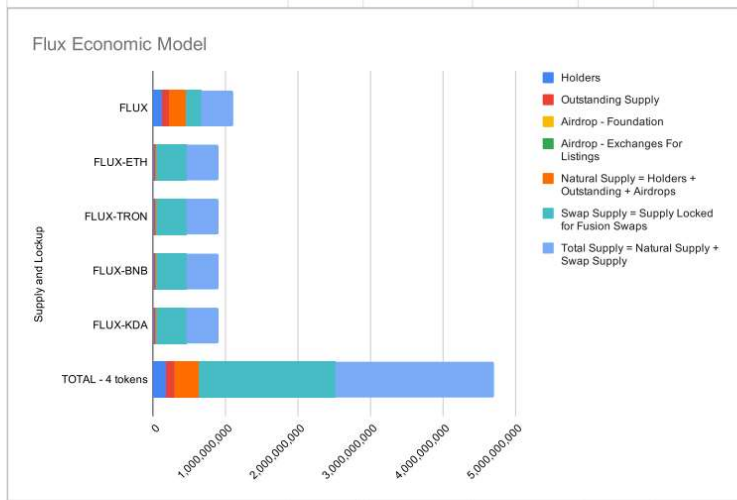
Projects brought under FluxLabs also receive asset management integration into Zelcore, along with solicited advice on many aspects of developing a complete, functional project and business. General FluxLabs features include:

- Asset integration in Zelcore for Windows, MacOS, Linux, iOS, and Android
- Accelerate legal, security, business and operations if desired
- Focus on the development of chosen platforms and guidance through iterative build processes including integration in Zelcore
- Guidance to other partners in the space to grow their project and build logical partnerships

FluxLabs services are included in the Zelcore integration price for early projects that meet set standards and are accepted for the incubation and acceleration development program. Zelcore integration and FluxLabs assistance is provided at very competitive rates, unlike other services in the space that have a large reach but require a substantial amount of coins for manipulative market making and advertising schemes that do not necessarily benefit the applicant project.

Flux Economics

Current Chain	Zel									
Total Supply	210,000,000									
Circulating Supply	125,000,000									
Outstanding Supply	85,000,000									
New Flux with Supply Parallel Chains	Main Chain	Target 10 Parallel				4 months	10 months			
Supply and Lockup	FLUX	FLUX-ETH	FLUX-TRON	FLUX-BNB	FLUX-KDA	TOTAL - 4 tokens	TOTAL @ 10			
Holder	125,000,000	12,500,000	12,500,000	12,500,000	12,500,000	175,000,000	250,000,000			
Outstanding Supply	85,000,000	8,500,000	8,500,000	8,500,000	8,500,000	119,000,000	170,000,000			
Airdrop - Foundation	2,500,000	250,000	250,000	250,000	250,000	3,500,000	5,000,000	Locked		
Airdrop - Exchanges For Listings	7,500,000	750,000	750,000	750,000	750,000	10,500,000	15,000,000	Locked		
Natural Supply = Holders + Outstanding + Airdrops	220,000,000	22,000,000	22,000,000	22,000,000	22,000,000	308,000,000	440,000,000			
Swap Supply = Supply Locked for Fusion Swaps	220,000,000	418,000,000	418,000,000	418,000,000	418,000,000	1,892,000,000	4,400,000,000	Ultra-Locked		
Total Supply = Natural Supply + Swap Supply	440,000,000	440,000,000	440,000,000	440,000,000	440,000,000	2,200,000,000	4,840,000,000			
TOTAL MAXIMUM CIRCULATION						308,000,000	440,000,000			
Infrastructure Rewards	FLUX	FLUX-ETH	FLUX-TRON	FLUX-BNB	FLUX-KDA	TOTAL - 4 tokens	TOTAL @ 10			
Mining Rewards	42,500,000	425,000	425,000	425,000	425,000	44,200,000	46,750,000	27.50%	Locked Distro	
Node Rewards	42,500,000	8,075,000	8,075,000	8,075,000	8,075,000	74,800,000	123,250,000	72.50%	Locked Distro	



Total Supply	4,840,000,000
Estimated locked	91%
Maximun Circulating Supply	440,000,000
Project	Max Supply
Eth	No Limit
Bittorrent	989,978,525,232
Crypto.com	100,000,000,000
Tron	71,659,657,369
VeChain	64,315,576,989
Stellar	50,001,806,812
XRP	45,404,028,640
Cardano	31,112,484,646
Raven	21,000,000,000
Digibyte	14,066,592,632
Flux	4,840,000,000
DOT	1,047,733,236
EOS	1,027,288,407
Chain Link	1,000,000,000
BNB	170,532,785

Parallel Assets

We have made the Flux asset more accessible, trade-able, and interactive with the DeFi space by doing strategic airdrops of Flux-based assets on other major chains. Snapshots are taken of current native Flux holders' addresses and the new tokens are claimable via the "Fusion" app within Zelcore. The first parallel asset is Flux-KDA, allowing Flux holders to experience the Kadena ecosystem and Dex without having to buy new assets. This also allows Flux to effectively be traded on Kadenaswap when it's released.

More parallel assets will be released including Flux tokens on Ethereum, Tron, Binance Smart Chain, and more protocols as new DeFi products emerge and stabilize into reputable service platforms.

To participate, crypto users only need to be holding Flux. Flux staked for FluxNodes is automatically captured in the snapshots and available for claiming within Fusion.

Official Links

Website <https://runonflux.io>

Documentation <https://zel.wiki>

Github <https://github.com/zelcash>

Wallets <https://zelcore.io>

Medium <https://medium.com/@FluxOfficial>

Block explorers <https://explorer.runonflux.io/>
<https://explorer.flux.zelcore.io/>

Social Media

[Twitter](#)

[Telegram US](#)

[BCT ANN](#)

[Zelcore Twitter](#)

[Telegram Russia](#)

[Discord](#)

[Youtube](#)

[Telegram China](#)

[Reddit](#)

Exchanges

[Kucoin](#)

[TradeOgre](#)

[Hotbit](#)

[CoinMetro](#)

[InstaSwap](#)

[Bitforex](#)

[STEX](#)

[Coinswitch](#)

Trackers

[CoinGecko](#)

[Delta](#)

[CoinLib](#)

[CoinMarketCap](#)

[Blockfolio](#)

[CoinCodex](#)

[CryptoCompare](#)

[MyCryptoStats](#)

[WalletInvestor](#)

FluxNode Resources

FluxNodes Dashboard | <https://dashboard.zel.network/>

FluxNodes Pricing Info | <https://dashboard.zel.network/d/4lEYxx9iz/zelnodes-pricing-data>