

 joystream Lightpaper

A video platform protocol

v1.3



Table of contents

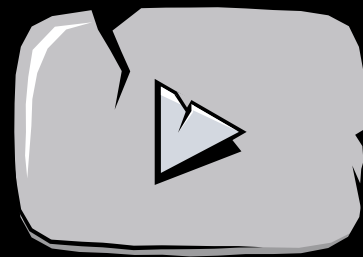
The Problem	01
The Solution	02
Positioning	03
Open Social Graph	04
Creator Rewards	05
Video NFTs	06
Creator Tokens	07
Applications	08
YouTube Vampire Attack	10
Content Moderation	12
The Blockchain	13
The DAO	16
The Network	20
The Token	23
The Founding Members	25
Connect	27

The Problem

Most user-generated videos are published, distributed, and monetized on a handful of closed corporate platforms, such as YouTube in the West or Youku in the East. These videos represent the most consumed form of online media today, with their cultural, social, and political significance only set to increase. However, we believe that these closed Web2.0 incumbents suffer from two major structural problems that hinder the full flourishing of this experience for both consumers and creators.

Siloed Innovation

Unlike open protocols like the web or email, where everyone can bring new products to market without permission, independent developers cannot build new products using the existing massive content and social graph on these closed platforms.



Undermonetized

For the long tail of creators - which is the vast majority, the advertising model works poorly, it requires massive scale and alignment with brands and products. Less than 5% can even monetize their content at all on YouTube.



The Solution

An open innovation platform, with a public network effect ready for everyone to contribute to and use, complemented by powerful new financial and audience growth primitives for long tail creators with a passionate audience.



Open Blockchain

An application specific L1 PoS blockchain custom built for a social video platform.



Open Social Graph

All profiles, channels, content, assets and metadata, fully public and indexed, available for everyone to publish to and read.



Content Storage

Large data assets, like videos and images, are stored in infrastructure paid for and operated by the DAO.



Content Delivery

Content is delivered on demand through a CDN paid for and operated by the DAO.



Video NFTs

One-of-one NFTs for videos sold through auctions and peer-to-peer transactions, with on-chain creator royalties.



Creator Tokens

Dedicated fungible token for each channel with a claim on the revenue of the creator.



A DAO

Token holders periodically select a council which votes on proposals to manage the network.

Positioning

Here is a systematic comparison with other content protocols and services that one might be inclined to think of as alternatives.

	Open Social Graph	Video NFTs	Creator tokens	Storage & Delivery	DAO
Joystream	✓	✓	✓	✓	✓
YouTube	✗	✗	✗	✓	✗
LBRY	✓	✗	✗	✓	✗
Rumble	✗	✗	✗	✓	✗
DeSo	✓	✓	✓	✗	✗
Theta	✗	✗	✗	✓	✗

Open Social Graph

The social graph of people, content, relationships, metadata and data assets, can be read from and written to, on equal terms, by everyone. This openness and neutrality is the key to unlocking permissionless innovation from builders.



Profiles

All consumers and creators can have a public and portable rich profile that works across all apps, and they fully own.



Channels

Creators own their own channel using their profile, and channels can themselves be bought and sold peer-to-peer.



Content

Within each channel there are content items with rich public metadata and data assets, which can be videos, playlists, books or any kind of media.



Metadata

Channels and content have rich on-chain metadata describing display, attribution and access control settings. New metadata standards can permissionlessly introduced by independent developer.



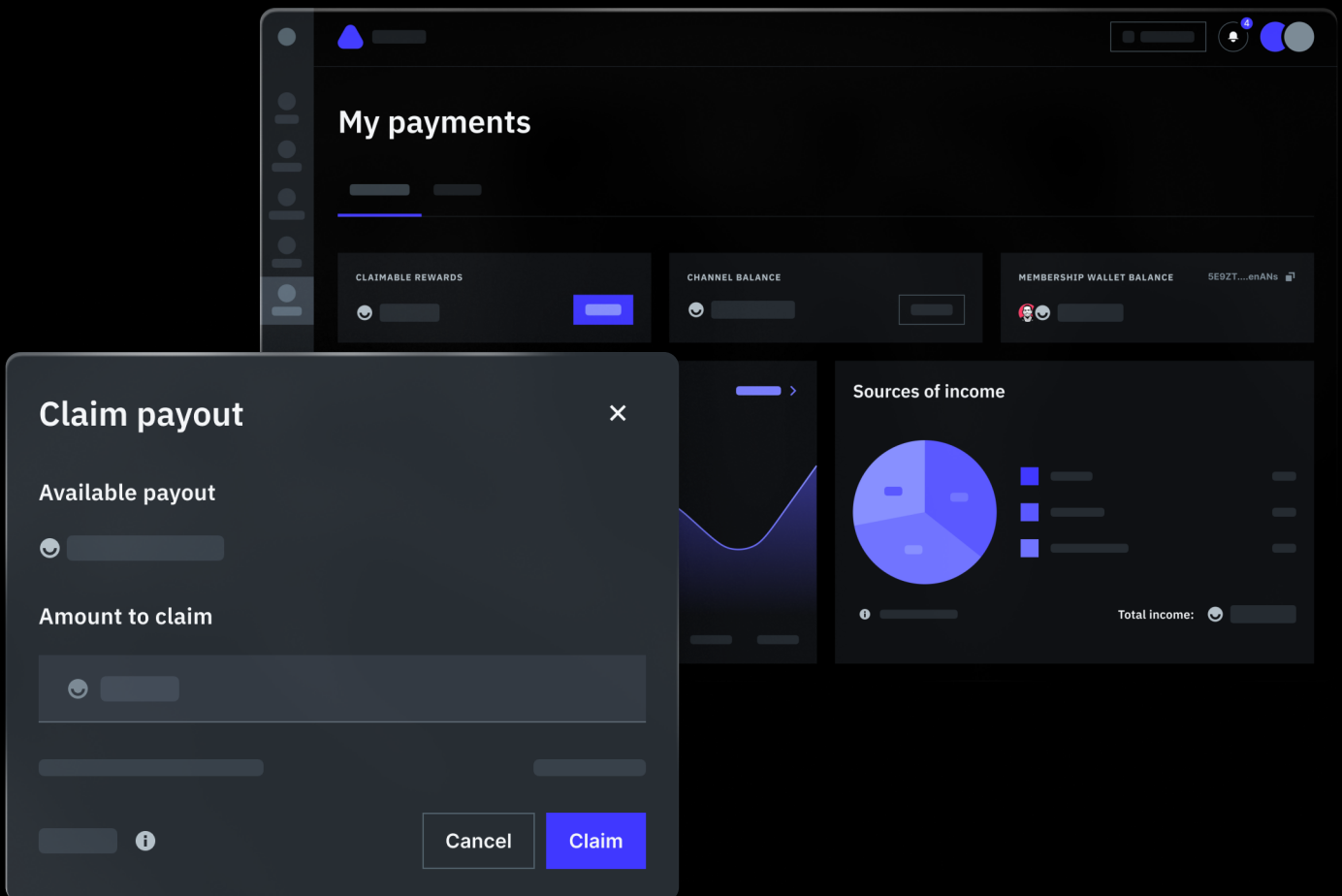
Data Assets

Channels and content have large data assets, like images, subtitles and audio tracks, with on-chain hash commitments and off-chain storage.

Creator Rewards

Creator rewards are payments to creators, from the council, on the basis of some policy the council chooses to implement. The council can choose whatever policy they believe align best with the goals and constraints of the network at any time, for example at times paying an outright flat rate for certain creators, or at times paying based on consumption in apps for others.

For the network as a whole, these payments are financed by minting new tokens - subject to the normal spending constraints of the council, no different than any other expense, such as paying validators, contributors or spending other spending proposals.

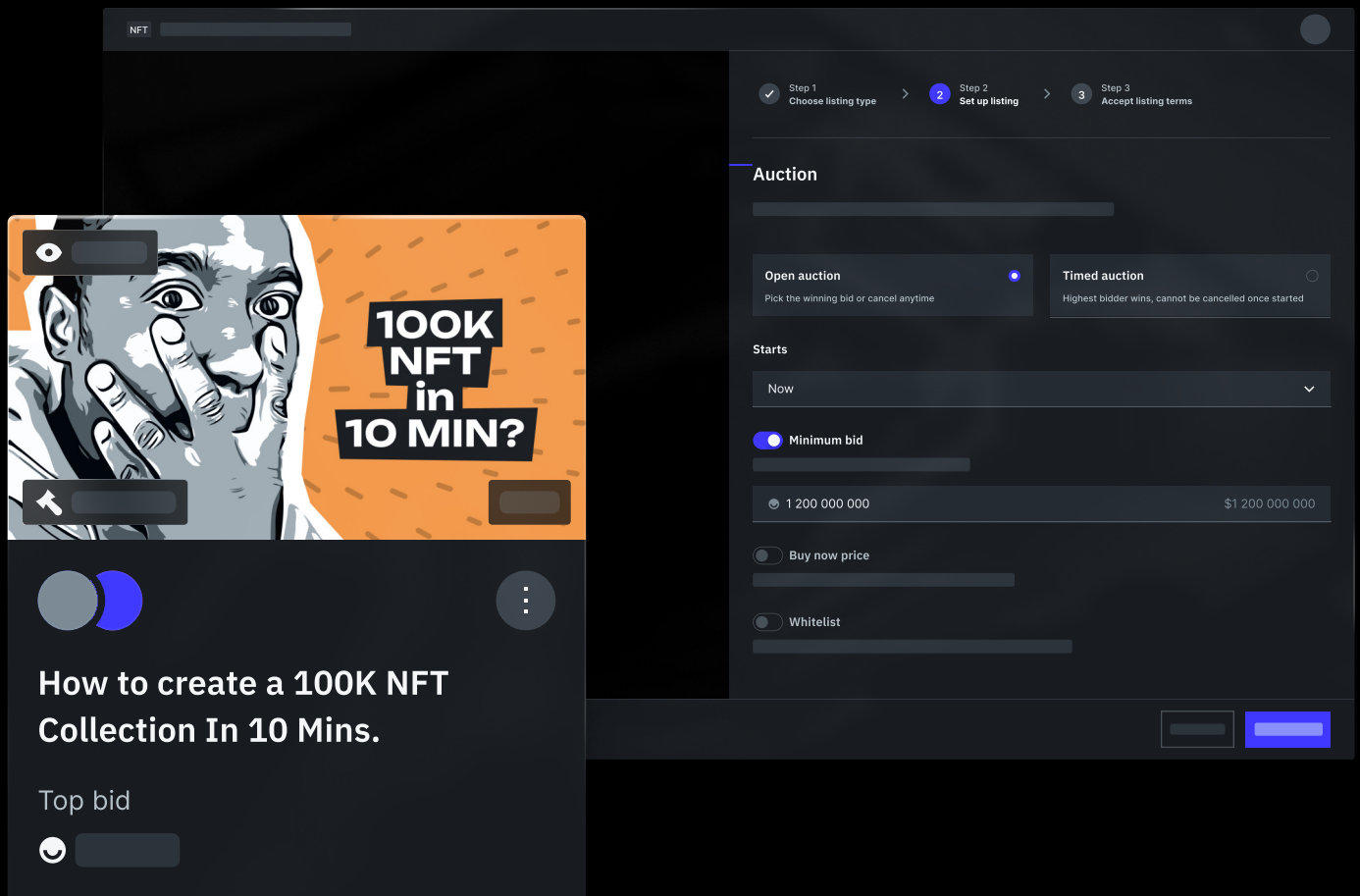


Video NFTs

Video NFTs create an intangible canonical association between a video and a user profile. This association, which is scarce, allows passionate patrons and followers to gain social proximity to highly valued art and expressions in their community and subculture. This scarcity is controlled by the creator initially, and can drive revenue through sales and royalties.

Minting

Creators can mint such video NFTs for their content, and then either give or auction away this NFT.



Unique ownership

NFTs are unique and transferable digital assets associated with each piece of content, which can provide various benefits such as access to content, events, or social venues. They are primarily used to display ownership of the content in consumer applications.

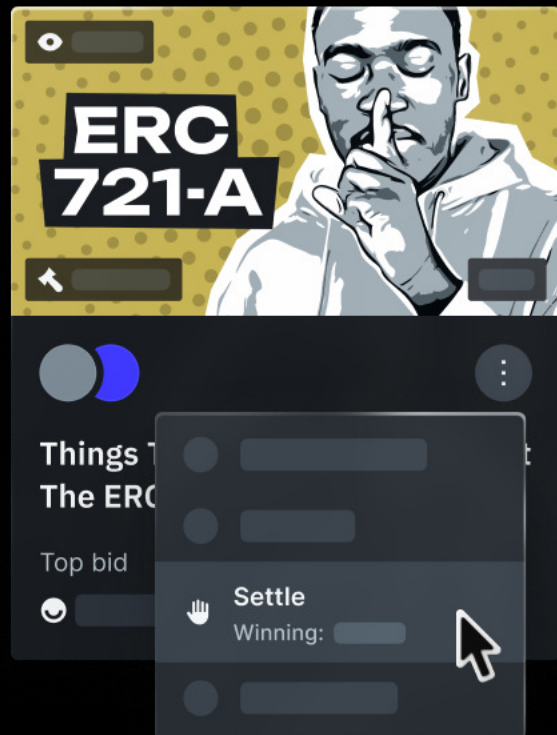


Web3 Wages & Salaries Demystified

2 weeks ago • 345K views

Selling NFTs

The owner can further choose to auction or sell the NFT all natively on-chain on Joystream, and this also provides the issuer with a royalty stream.



Creator Tokens

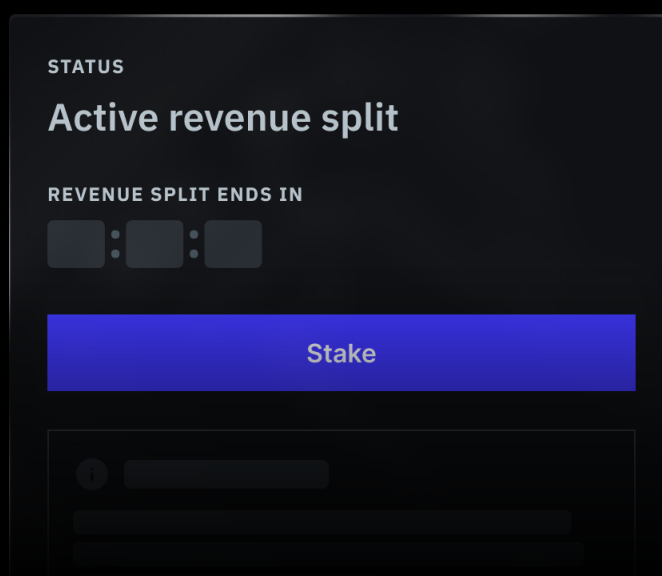
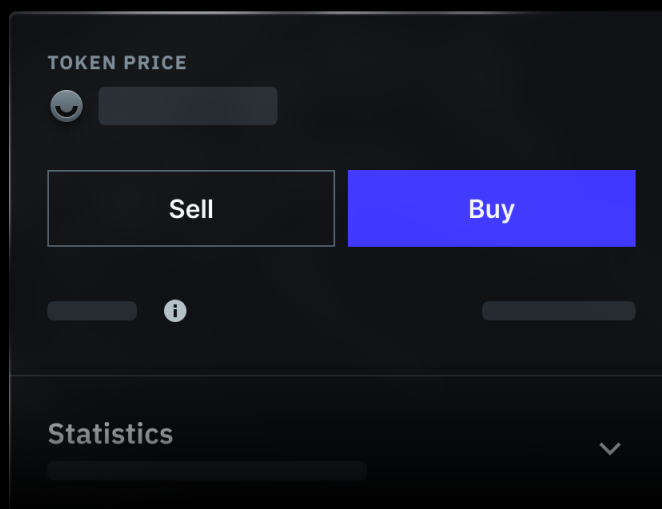
Creators are like entrepreneurs, taking risks and investing time, effort and money to reach their audience. Creator tokens offer a low-cost and low-friction way for creators to share the risk and reward of their activity with their passionate audience, leading to transformative outcomes.

Issuing tokens

Creators can issue and sell their creator tokens, or just give them away, and control who can get access to them, and impose vesting constraints on that access.

Revenue share

They can share a portion of the revenue their channel generates with the token holders.



Automated market maker

They can also launch a bonding curve based automated market maker which allows for easy liquidity in and out of the token at any time.

Market transactions			
DATE ↓	MEMBER	ACTION	PRICE PER UNIT
9 Nov 2022, at 09:43 222 267 066 block	mokhtar	↑ Bought	101 \$101
23 Nov 2022, at 11:02 242 201 092 block	0x2bc	↓ Sold	104 \$104
2 Nov 2022, at 22:43 213 206 022 block	marat_mu	↑ Bought	100 \$100
15 Nov 2022, at 06:00 228 545 555 block	ururu	↑ Bought	98 \$98
11 Nov 2022, at 07:00 224 201 332 block	ikskrn	↓ Sold	100 \$100

Invite only

Lastly they can of course gate access to content and associated other benefits with holding the token.

\$JBC

🔒 Invite only

TOTAL REV. ⓘ

🌙

REV. SHARE ⓘ

AN. REWARD ⓘ

TOKEN PRICE

🌙

Sell

Buy

Applications

New social products can quickly enter the market without having to rebuild their content, creator, and consumer network, which is costly and difficult. They also can leverage a rich suite of open source tools, software and standards. Incumbent platforms, like YouTube, try to serve everyone in one product. This leads to a one-size-fits-all approach to functionality, algorithmic discovery, monetization and moderation policies. Open platform will unbundle these monolithic closed siloes.



Incentives

Onboarding creators or content in application makes them automatically available for distribution in other applications. Originating applications can assign verifiable attribution when creating creator profiles, and this allows the platform to pay application developers for building new experiences and capturing creators for the platform as a whole. The policies for this are determined by governance, and can be informed by things like views or portions of future NFT and Creator Token platform fees.

Monetization

Once applications are at sufficient scale, they can monetize their end-users through a variety of means, be it fiat, crypto, subscriptions or advertising, and the Joystream Network can further require payment for use of the content and infrastructure it offers to such applications.

Open source

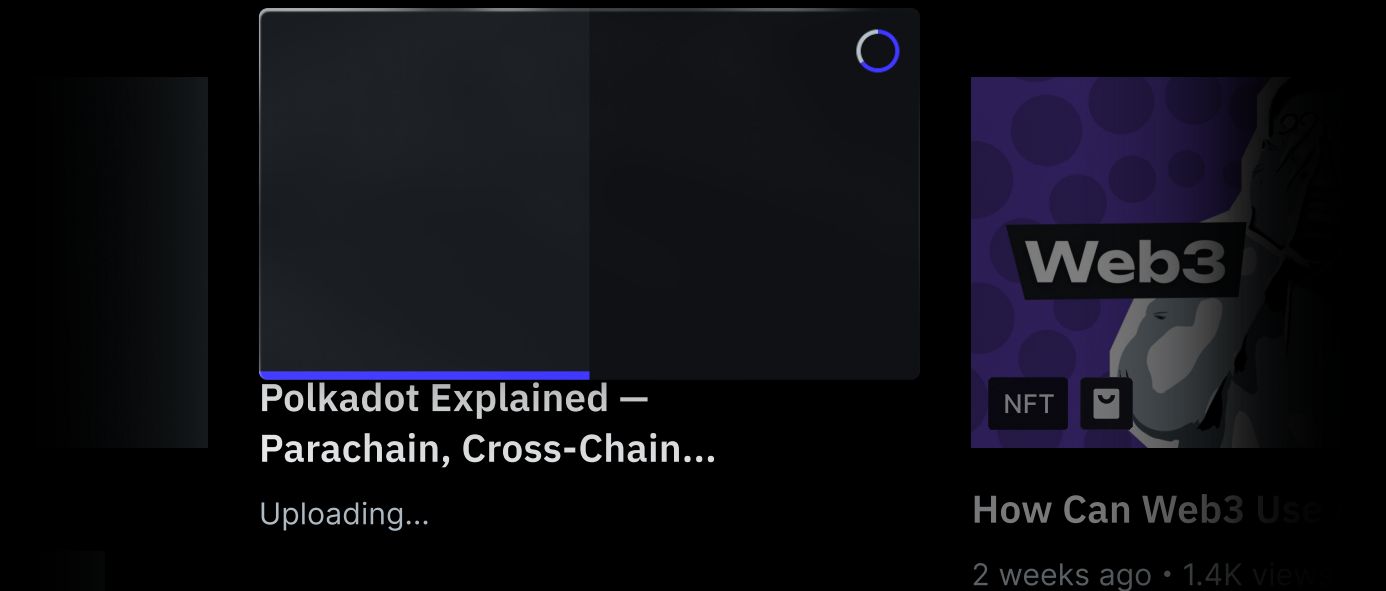
A rich suite of open source products, like Atlas, and infrastructure, like Orion, have been developed as whitelabel toolkits for new develop to launch new applications and video communities, possibly with their own unique vertical content focus, without having to write a line of code.

YouTube Vampire Attack

Since the majority of video creators, and the majority of existing content, exists on YouTube, special open source infrastructure - called YouTube-Synch, has been built to allow creators to have all of their back catalog and future uploads to be replicated to their Joystream channel from YouTube automatically.

Any application built on Joystream can run its own instance of this infrastructure to aid in onboarding creators.

Creators thereby only have to give a one time approval to create and maintain a presence on both platforms, making it a no-brainer for them to give it a try, as they gain a wide range of benefits at virtually no cost:



We facetiously refer to this as a vampire attack, however it is contingent on the approval of each individual creator to use their content as directed, content over which they still retain full copyright and control over even after having published to YouTube.



Backup

Free ongoing backup of all of their content and channel.



Sign up

Receiving \$JOY tokens for signing up.



Rewards

Receiving \$JOY tokens for each video replicated from YouTube to Joystream.



Video NFTs

Being able to mint and sell their videos as NFTs, with royalties.



Creator token

Be able to issue a creator token for their channel, with built-in revenue sharing, market making, creator dividend and more.



New audience

Direct and noise-free access to target content consumers outside the algorithmic opacity of YouTube.



Ownership

Own their own channel and content using their keys, forever, just like you own your crypto assets.

Content Moderation

Since Joystream has a built in content storage and content delivery layer, it is unavoidable for the system to exercise some control over what content it chooses to serve. This is needed not only for economic reasons, but also because out-of-policy content may be unaligned with the social commitment in the community and also in conflict with certain rules to which service providers are subject.

Joystream vs Youtube

Since Joystream however unbundles the content offering into an infrastructure and an application layers, there is substantially less pressure to impose on global policy about what content is served to end-users compared to a monolithic platform like YouTube, which has to balance a broad range of economic, policy, product and commercial concerns across a single product and enormous user base.

Applications

Applications are best suited at exercising and managing very fine grained and detailed policy concerns around moderation and content suitability, by taking into account detailed knowledge about their particular more narrow user base, and users can sort into the product that has the optimal tradeoff of cost, diversity and other values.

The Blockchain

The centerpiece of the Joystream Network is the blockchain which serves as a shared content, social, governance and asset ledger. It is a custom built blockchain, specifically for the purpose of a user owned and operated video platform. The current reference implementation is written in Rust, based on the Substrate framework.



Consensus

Validators are chosen using Nominated PoS, and block creation follows a slot-based stochastic schedule called BABE. Deterministic finality is achieved via a classical BFT protocol called GRANDPA, which relies on the assumption that at least $\frac{1}{3}$ of validators are honest.



Interoperability

With a high throughput deterministic finality consensus protocol, the chain is ideally suited for doing trust minimized interoperability with other chains, for example using [IBC](#), [XCMP](#) or other bridging protocols.



Block Time

The target average block time is 6 seconds, but it is not deterministic.



Block Space

The maximum size of each block is 5MB every 6s, compared to roughly 100Kb on Ethereum every 10s. This means the total space throughput per minute for each is 50MB and 600Kb respectively.



Validator set

The size of the validator set depend on the incentive to validate, which itself a automatically adjusting staking reward which targets an ideal staking rate for validation. The consensus algorithm is known to safely allow many hundreds of validators at scale.



Fees

Transactions have fees associated with their size and compute requirements. The latter is efficiently computed in constant time, side-stepping one of the main costs of smart contracting runtimes with dynamic resources accounting. The fees burned, but an extra tip can be added for priority inclusion.



Throughput

The number of transactions that can be processed depends on the type of transactions sent, but a useful benchmark is that one create 720 new channels per 6s block, in isolation. For reference, roughly 50 videos are published on YouTube per second.



Forkless Upgrades

The blockchain has a built in upgrade feature which allows the protocol to be upgraded in-flight, without the risk of a fork, triggered by a successful governance proposal.



Execution Environment

The execution environment is WebAssembly, with a runtime written in Rust. There are no smart contracts and there is no EVM.

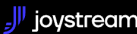











Audited

The blockchain has been audited by two leading security auditing firms for Substrate based blockchains, SRLabs and Quarkslab their reports are available to read [here](#) .

The DAO

The design philosophy behind the DAO is to optimistically allow specific actors with domain specific knowledge the ability to make unilateral and fast decisions within a narrow domain. However, high risk decisions must be ratified multiple times, and bad actions can be observed and sanctioned through slashing. This allows Joystream to sidestep some of the key problems, around apathy and inefficiency, which have constrained many prior DAOs.






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-  My Profile
-  Working Groups
-  Proposals
-  Council
-  Bounty
-  Election
-  Forum
-  Members
-  Settings
- ▼ COMING SOON

🏠 > Working Groups

Working Groups

Openings Working Groups

		WORKERS	CURRENT BUDGET	
	Forum Monitor and supervise public communication channels for compliance with usage policies as decided through the governance system.	5	2000764 tJOY	3
	HR Human Resources working group is responsible for integrating new members greeting, onboarding, catalyzing and nurturing, as well as...	11	24449687 tJOY	2
	Storage Broadly responsible for ensuring storage infrastructure uptime, namely running complete and up-to-date copy of the content...	14	5175372 tJOY	3
	Marketing Marketing group is responsible for increasing the outreach, sharing the content from the platform with the world, spreading the news...	12	5674900 tJOY	3
	Content Monitor publishing of the new content into the content directory, respond to the reported publications and adjudicate possible disput...	8	6025237 tJOY	2



Builders

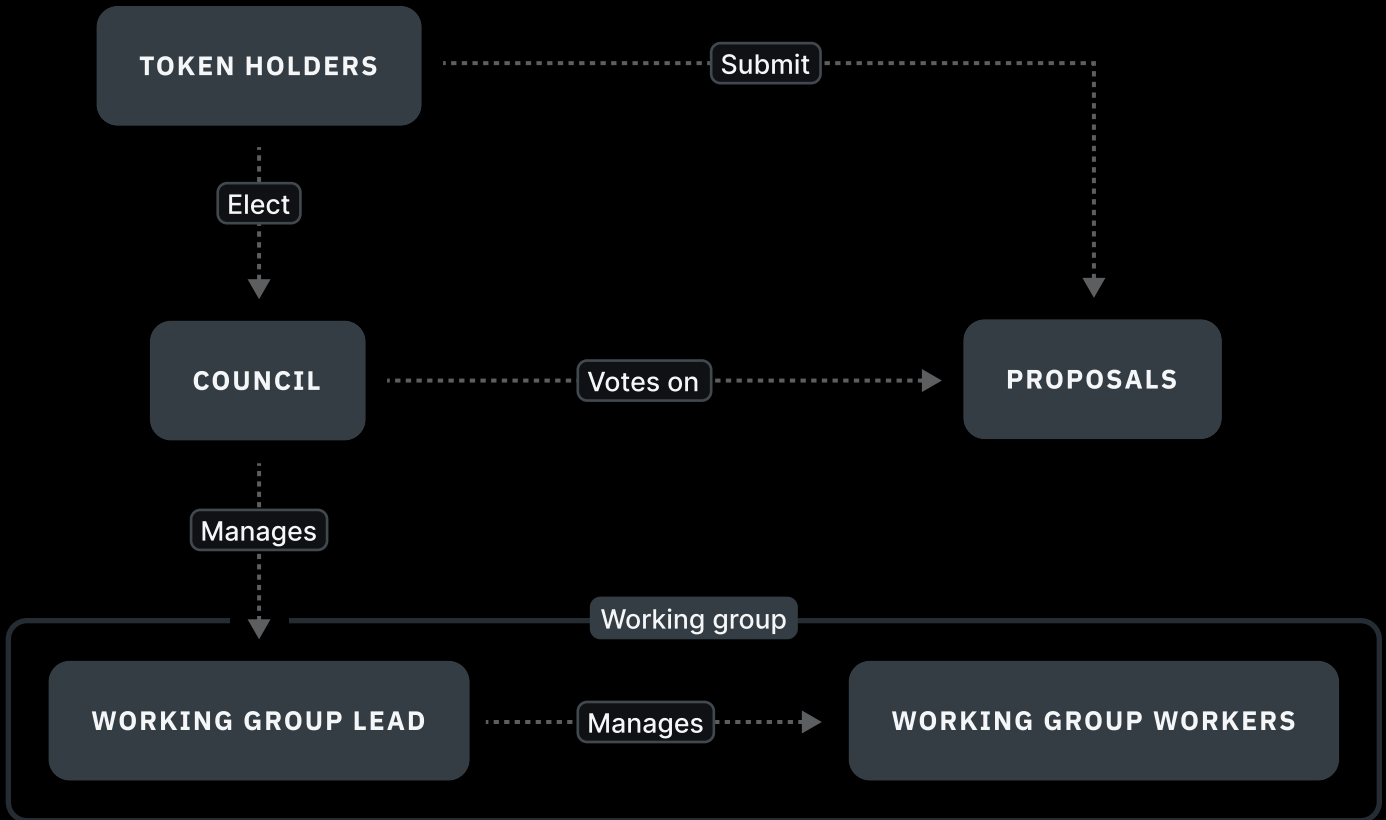
A diverse set of contributors, such as Developers, Designers and Product Managers, responsible for development of infrastructure and user facing applications.

11

15000000 tJOY

4

Architecture



Token Holders

The root authority in the governance system are the token holders, who have the right to vote in periodic council elections, which currently occur every 15 days.

Council & Proposals

The council is a small body, currently with 3 seats, tasked with the daily operation of the network, chiefly by creating and voting on proposals in the proposal system. Only the council votes on proposals, through a one member one vote system, but anyone is free to create a proposal. There are many different types of proposals, and they also vary in terms of the quorum and threshold requirements to pass the proposal, as well as possibly how many council periods must ratify a proposal before it is executed.

Working Groups

There are multiple domains of expertise involved in operating the network successfully. The council will have limited time and knowledge to operate within all of these domains effectively. It may also be more subject to frequent changes, which means a lot of operational details may be lost. Working groups are like topic specific departments, with a dedicated leader, budget and workers, all with a recurring reward payment, who take on the task of managing a particular subsystem. They are accountable to the council, which can manage their budget and fire, hire and slash the lead. The following nine working groups exist.



Builders

Developers, designers, product managers, QA staff and anyone contributing to analyzing, testing or building software and protocols.



Distributors

Operating a content delivery network which is tasked with delivering content to end users at low latency.



Storage Providers

Operating a redundant storage infrastructure which accepts uploads from publishers, replicates it for redundancy, and then acts as origin for distributors.



Content

Operating content curation over the content index in line with policy set by council.



Membership

Managing the purchasing and verification process for members.



Apps

Supporting application developers and operators.



Forum

Moderating the on-chain forum.



Marketing

Conducting marketing activities in line with the objectives of the council

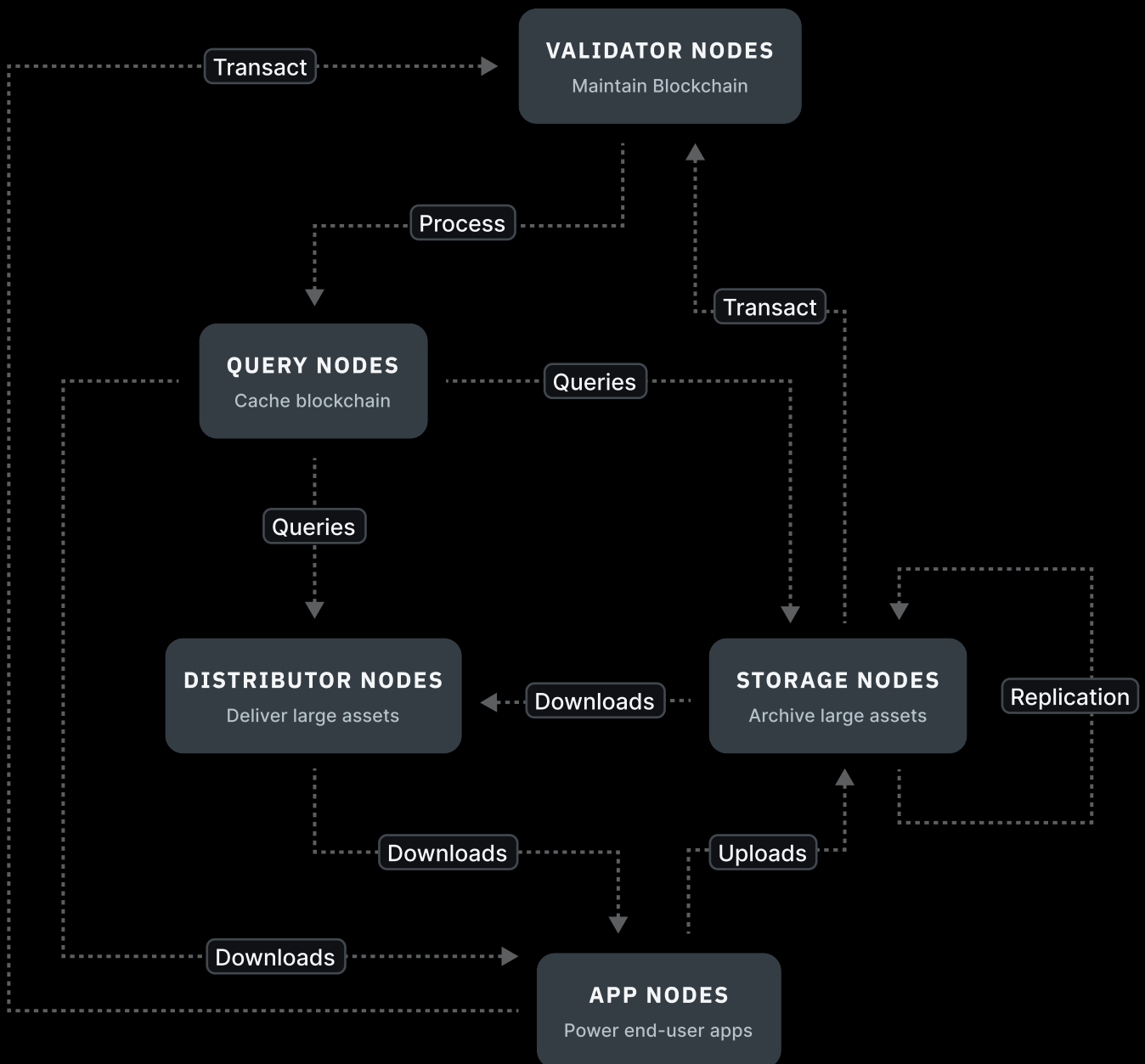


HR

Recruiting and supporting contributors and participants.

The Network

A range of different node types work together to power the network. Each type provides a distinct infrastructure level service, and many distinct participants operate instances of each type. These participants are paid, staked and sometimes directed, by the governance hierarchy in the DAO. In these cases, such participants have to be hired for their respective roles through transparent on-chain processes.



Validator Nodes

Nodes that fully validate the transaction ledger and can produce new blocks when run as validators.

Storage Nodes

Long term archival storage of large assets - like video and images, accept upload from users, replicate data to avoid corruption and loss, and deliver content to content delivery nodes on demand. Operators running these nodes are organized, paid and sanctioned by the storage working group, and the blockchain maintains an index of what responsibility each operator has at any given time.

Distributor nodes

Low latency on-demand content delivery to end user devices of large assets - like video and images. Each node has a geographic service area, and maintains a local cache to make fast delivery feasible. Underlying data is sourced from appropriate storage nodes.

Query Nodes

Build a queryable state based on processing the transaction history of the blockchain, which allows other applications and infrastructure to have fast and convenient APIs with which to keep up with the chain. These nodes typically are operated in conjunction with one of the other nodes, and there is no separate operator role for this node.

Application Nodes

Power end-user applications. They are tasked with holding on to private data not suitable for public view, and also delivering recommendations and discovery services based on this data. Also authorize the access of end users to the content infrastructure, and can be tasked with financing this access by burning \$JOY, while alleviating the need for consumers to obtain crypto assets to consume content.

The Token

The native token \$JOY is used to govern and keep the network secure, and pay for access to network services and block space.



Ticker

\$JOY



Supply

1,000,000,000 \$JOY, however there is no supply cap.



Base Unit






Called Hapi, equivalent to Satoshis in Bitcoin. There are ten billion (10,000,000,000) Hapi in each \$JOY

Genesis block





	Genesis %	Genesis Liquidity	Vesting Duration
Community FM*	21.2189609%	8%	24 months
Jsgenesis FM*	31.435%	8%	24 months
Investors	32.3285352%	79%	12 months
Membership Airdrop	0.21735%	8%	24 months
Strategic Partners	3.0013001%	100%	0 months
Reserved 1	11.7988418%	0%	12 months
Reserved 2	0.000012%	8%	24 months

*FM = Founding Member

JOY tokens are minted when...

- 
Validators are rewarded for their work
 Validators are rewarded for running nodes with the newly minted tokens.
- 
Councilors, workers and leads are paid out
 Council elects, work groups leads and workers get paid regular salary defined by council.
- 
Creators are being rewarded for publishing high quality content
 Council rewards scheme is in operation, rewarding best performing channels on a regular basis.
- 
Joystream-based applications are being recognized and rewarded
 Gateway attribution rewards scheme incentives put in place for the App operators to grow the engagement.
- 
Financing spending proposals and bounties
 Financing proposals to remunerate misc parts of the platform operations also result in new tokens minted.

JOY tokens are burned when...

- 
A creator token is sold
 Platform fees apply and get burned from each sale transaction with creator tokens.
- 
An NFT is sold
 Platform fees apply to each NFT transaction.
- 
Application fee is charged
 Running your own Application comes with the fee paid to the DAO that gets burned, increasing token value
- 
New content is published
 Transaction fees taken on channels, content creation and interaction gets fully burned.

The Founding Members

Joystream was launched by people working in an entity [Jsgenesis](#) and by an online distributed community. The project underwent a lengthy development process, with multiple incentivized testnets from 2019 to 2022, to mature the technology and attract and train community members who would direct and operate the DAO post-launch. The [founding member program](#) was created to build a well-trained and passionate community by allowing non-US members to earn \$JOY allocations through participating in the testnet across various roles and activities. Once they reached a certain level of involvement, they would receive the status of a founding member and an on-brand avatar, as well as recognition in the blockchain. The founding member status may also include anyone who has worked directly with Jsgenesis.





A user owned and operated video platform

There are many ways you can engage with our community and follow up on the platform development news. Everyone is welcome.



Twitter

twitter.com/JoystreamDAO



Discord

discord.com/invite/NaNzysB5YZ



Gleev

gleev.xyz



Reddit

reddit.com/r/joystream_dao



Github

github.com/Joystream



Handbook

handbook.joystream.org



Element

app.element.io



YouTube

youtube.com/@joystream8627