Building Web3's Video Infrastructure Layer

Why Openness and Decentralization Matter

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Coming up in this talk…

1. Introduction
   - Who am I?
   - Who is Livepeer: a collection of open source projects
   - Why we do what we do
2. Explain components of Livepeer
   - Public permissionless protocol
   - Open source video software
3. Livepeer and you
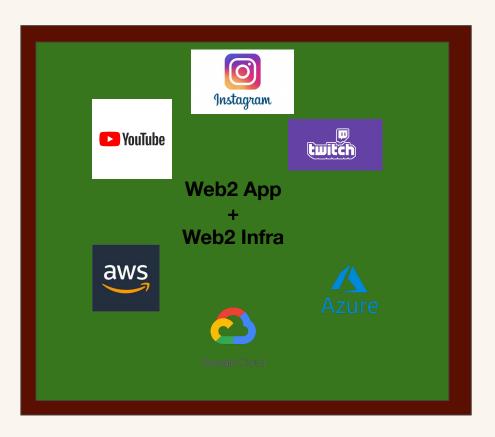   - Opportunities to contribute/get involved

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Who is Jaron?

- Project lead for MistServer
- VP engineering Livepeer
- Fixed RTMP reconnect bug in OBS
- acpatterns.com
- Bumblebee
- FOSDEM team 2016

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Livepeer

Livepeer

- Mission statement
  - Create the world's open video infrastructure
- Livepeer Protocol
- Livepeer Token
- Livepeer Inc
- Software projects

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Creator Economy Walled Garden

**Web2 App
+
Web2 Infra**

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Livepeer Projects

1) Protocol and Node Software
2) MistServer
3) Adjacent Software

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Why open source and Web3?

1) Overlap between core values of open source and web3/blockchain/decentralization
2) Open source in Web3 is a motivator to contribute, which is core to ecosystem growth

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Shared Values

- Security
- Transparency
- Composability
- Contribution
- Consensus

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Open Source at Livepeer

Past: All code repositories are public, some organic contribution and occasional bounties; grants to support open source ecosystem projects
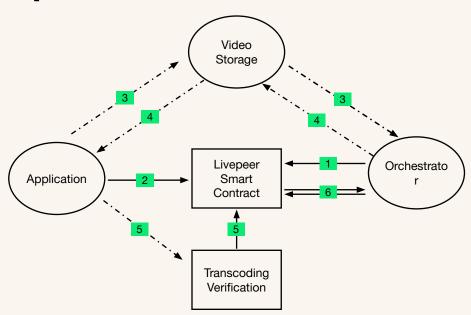
Today: Confluence security audit and bug bounty; creating clear pathways to contribute and better systems

Future: Enablement of broad contribution and more robust grants program

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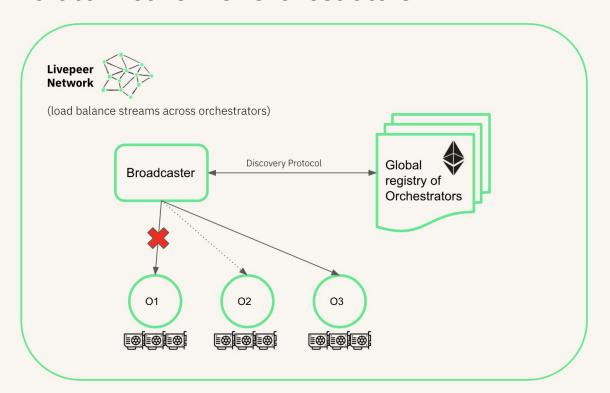# The projects

Livepeer Protocol & Node software

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Livepeer Protocol
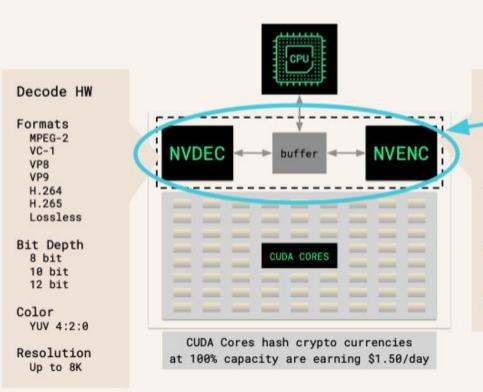

On-chain / Off-chain

1. Orchestrator Advertise Capability / Price

2. Application Creates Deposit

3. Application Sends Micropayment / Video / Signature to Transcoder

4. Application Checks for Micropayment Validity, Sends Transcode Result / Signature Back

5. Application Verifies Transcode Result, Challenge if Verification Fails

6. Transcoder Cashes Micropayment

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Global Network of Orchestrators

Livepeer Network

(load balance streams across orchestrators)

Broadcaster

Discovery Protocol

Global registry of Orchestrators

O1   O2   O3

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GPU miner revenue at zero opportunity cost

Decode HW

Formats
 MPEG-2
 VC-1
 VP8
 VP9
 H.264
 H.265
 Lossless

Bit Depth
 8 bit
 10 bit
 12 bit

Color
 YUV 4:2:0

Resolution
 Up to 8K

CPU

NVDEC ⟷ buffer ⟷ NVENC

CUDA CORES

CUDA Cores hash crypto currencies
at 100% capacity are earning $1.50/day

Encode HW

Formats
 H.264
 H.265
 Lossless

Bit Depth
 8 bit
 10 bit
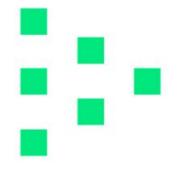
Color
 YUV 4:4:4
 YUV 4:2:0

Resolution
 Up to 8K

- Video transcoding ASICs sit idle

- Can transcode 2 1080p videos for
  $0.14 in electricity and $0.60 in
  bandwidth/day

- Cloud providers charge $144/day for
  transcoding 2 HD videos

- Miners can capture this opportunity
  without disrupting their existing
  mining through Livepeer

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Video Service Providers

$2.40

per hour transcoded

Cloud Infrastructure

$1.20

per minute transcoded

Livepeer Video Service

$0.3

per minute transcoded

Livepeer Protocol / Node / LPT
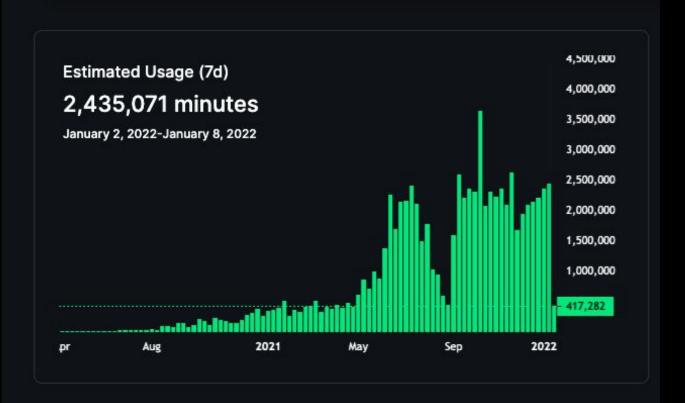
Check out **livepeer.org** for more on the crypto-related stuff.

Check out **livepeer.com** if you want an easy way to use the network without needing to bother with crypto.

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Protocol Explorer

li:epeer

- Overview
- Orchestrators
- Voting
- Connect Wallet

Estimated Usage (7d)

2,435,071 minutes

January 2, 2022–January 8, 2022

417,282

4,500,000
4,000,000
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000

pr   Aug   2021   May   Sep   2022

MistServer

MistServer

- Streaming media toolkit
- Focus on protocol and format compatibility, ease of integration
- Made by developers, for developers!
- Project active since 2007
- Maintained by DDVTech B.V., based in the Netherlands
- A Livepeer subsidiary since October 2021

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MistServer

Check out **mistserver.org** for documentation, downloads, etc!

Who needs more than one slide, anyway! 😏

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Adjacent software

Adjacent software

- CLI transcoder tool
- Web-based streaming tool
- Metrics-collecting tools
- …etc
- Fan projects! ❤

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Contribution Opportunities

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How do you get started?

- Organic Contribution: find something and fix it

- Bounties: compensation with a known scope

- Grants: financing for your own project

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More about the grants program

- Adjacent Software
- Applications or tooling
- Projects that help people interact with the Livepeer network
- Improves the experience, not part of the core code

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Become a Contributor!

1) The Go-Livepeer Contributor Guide is available at
   github.com/livepeer/go-livepeer

2) The Docs Contribution Guides is available at
   https://docs.livepeer.org/contributing/overview

3) Join the Livepeer Discord, #core-dev and #video-dev

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MistServer - Even open sourcererer!

To show how much we love the open source community, we're planning to release all of MistServer, including previously closed-source components, under a much more free license around valentines' day 2022*! (Yes, that's in a bit over a week.)

*) Date subject to change. Please don't hate us if we miss this. Our love may be unconditional, but releases need time sometimes. ❤

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Work @ Livepeer, Inc.

Protocol Engineer	Apply
Chief Operating Officer	Apply
Operations Manager	Apply
Senior Video Infrastructure Engineer	Apply

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