

# PAI Announcements



1. PAI Coin is now listed on two more exchanges: *Livecoin* and *Alameda OTC*

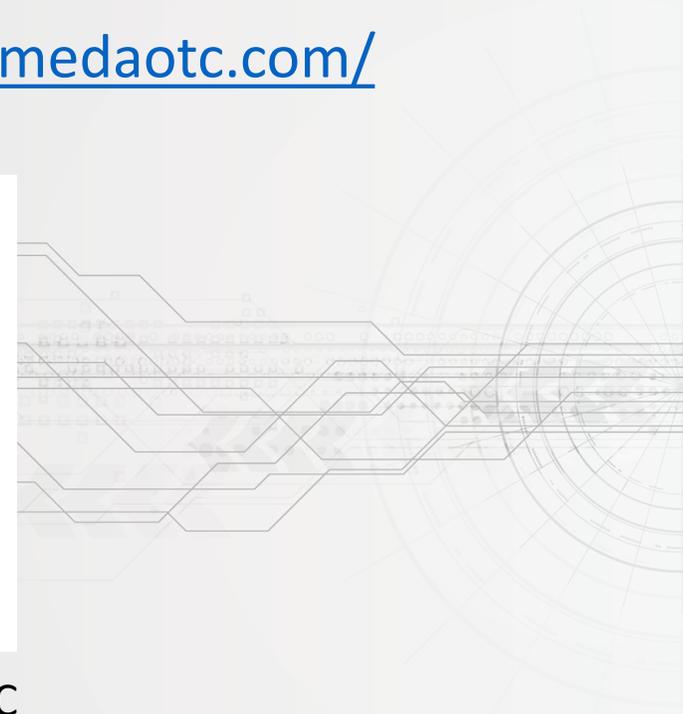
- Buy, Sell, and Trade PAI Coin on Live Coin here: <https://www.livecoin.net/en>
- Buy, Sell, and Trade PAI Coin on Alameda OTC here: <https://alamedaotc.com/>



Sign Up for Livecoin



Sign Up for Alameda OTC



# PAI Announcements



## 2. PAI Celebrity Livestream Series: An Evening with Rob Mac

- Basketball Coach Rob Mac, who trained top NBA players such as Steph Curry, will be live on August 8<sup>th</sup>, 9:00am Beijing Time, and share his experiences working as a trainer and consultant for NBA players.
- Register to meet Rob Mac on August 8:

[https://zoom.us/meeting/register/tJllde2oqz4jEt3WF8nPT16F9CYHp9XkHf\\_L](https://zoom.us/meeting/register/tJllde2oqz4jEt3WF8nPT16F9CYHp9XkHf_L)



Register to Meet Rob



Presented by PCP Gold



# PAI Announcements



## 3. Tiered Staking Rewards: Incentivizing users to collectively stake more PAI Coin.

- The total amount paid out to all users for staking will increase as the total amount staked by all users increases.
- Each tier increases 25 million PAI coin total staking, and the block reward increases 25 PAI coin.
- Block reward for staking will be adjusted once a week according to the total staking amount in PCP.
- Annual staking reward will be stable: 6%-9%.

# PAI Announcements



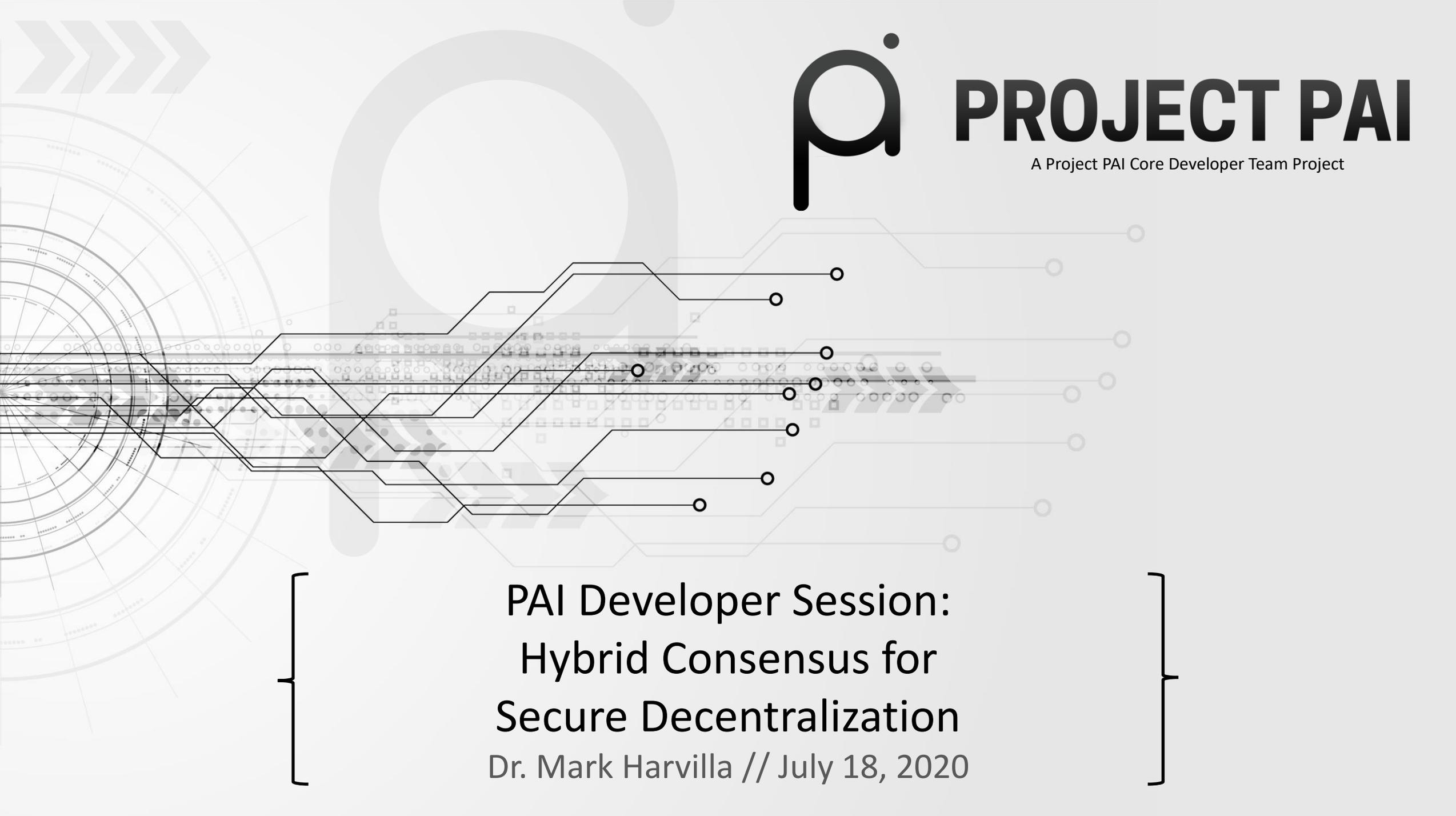
## 3. Tiered Staking Rewards:

Amount of PAI staked when a block is mined	Block reward for staking
0 - 75 Million	75 PAI - <i>current level</i>
75 - 100 Million	100 PAI
100 - 125 Million	125 PAI
125 - 150 Million	150 PAI
For each stage + 25 Million	+25 PAI
≥750 Million	750 PAI



# PROJECT PAI

A Project PAI Core Developer Team Project



PAI Developer Session:  
Hybrid Consensus for  
Secure Decentralization  
Dr. Mark Harvilla // July 18, 2020

# Project PAI Core Contributors



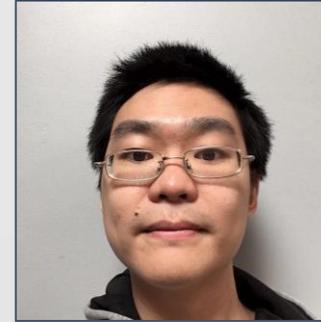
Lanier AI Labs



Nikhil Jain



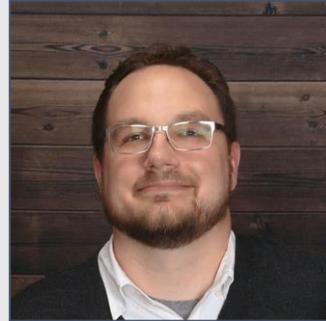
Mark  
Harvilla



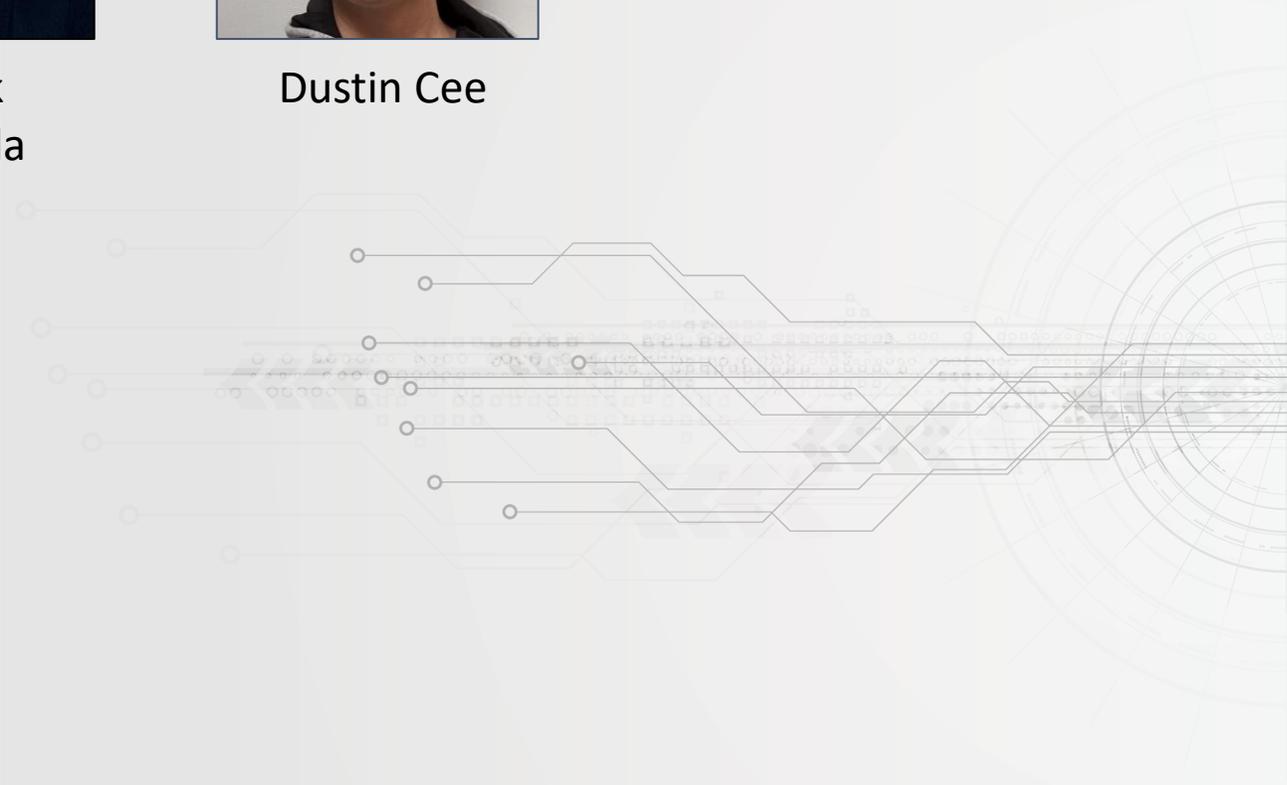
Dustin Cee



Up and Running  
Software



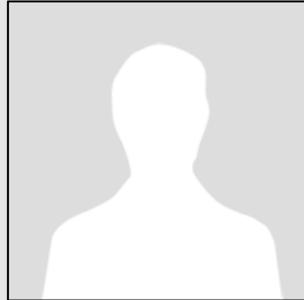
Patrick Gerzanics



# PAI Developer Community



J1149



Alex Waters



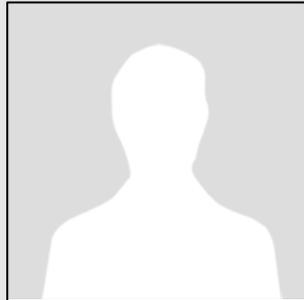
Tarnover



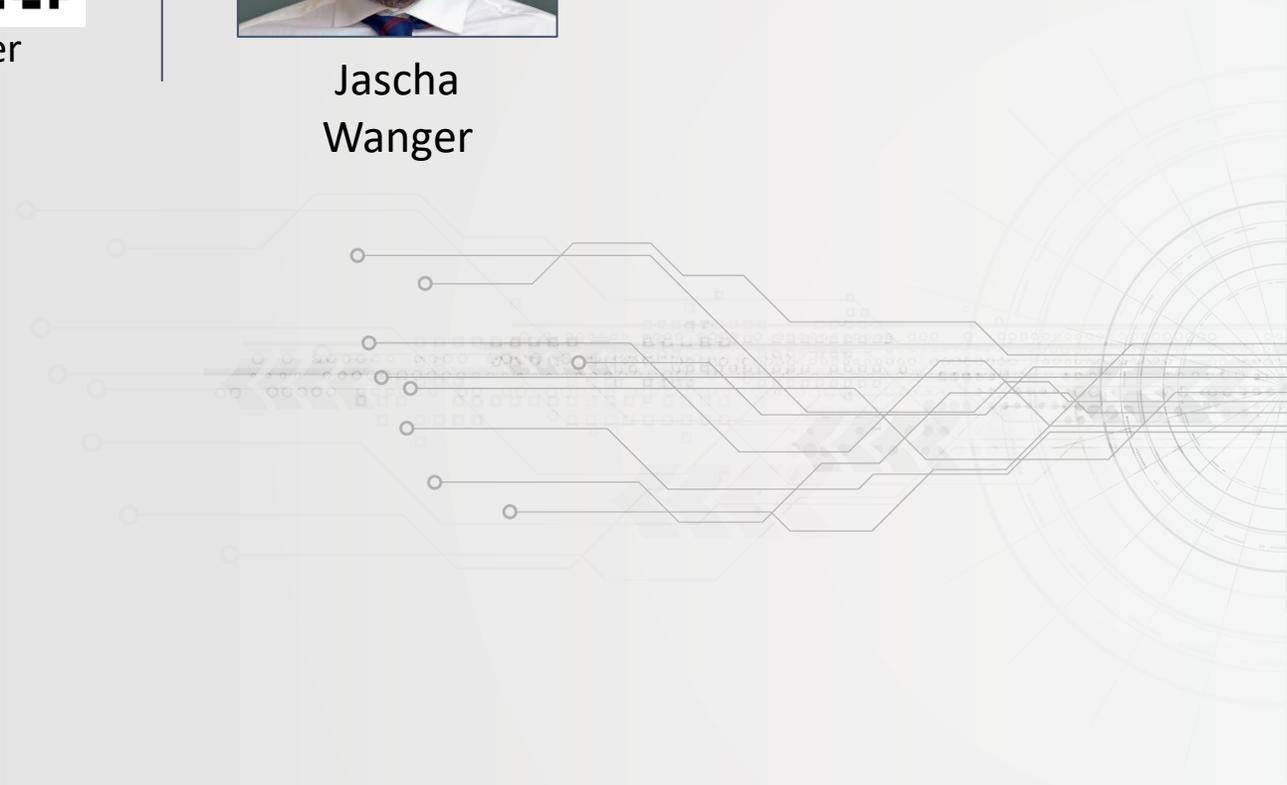
Jascha  
Wanger



P19 Labs



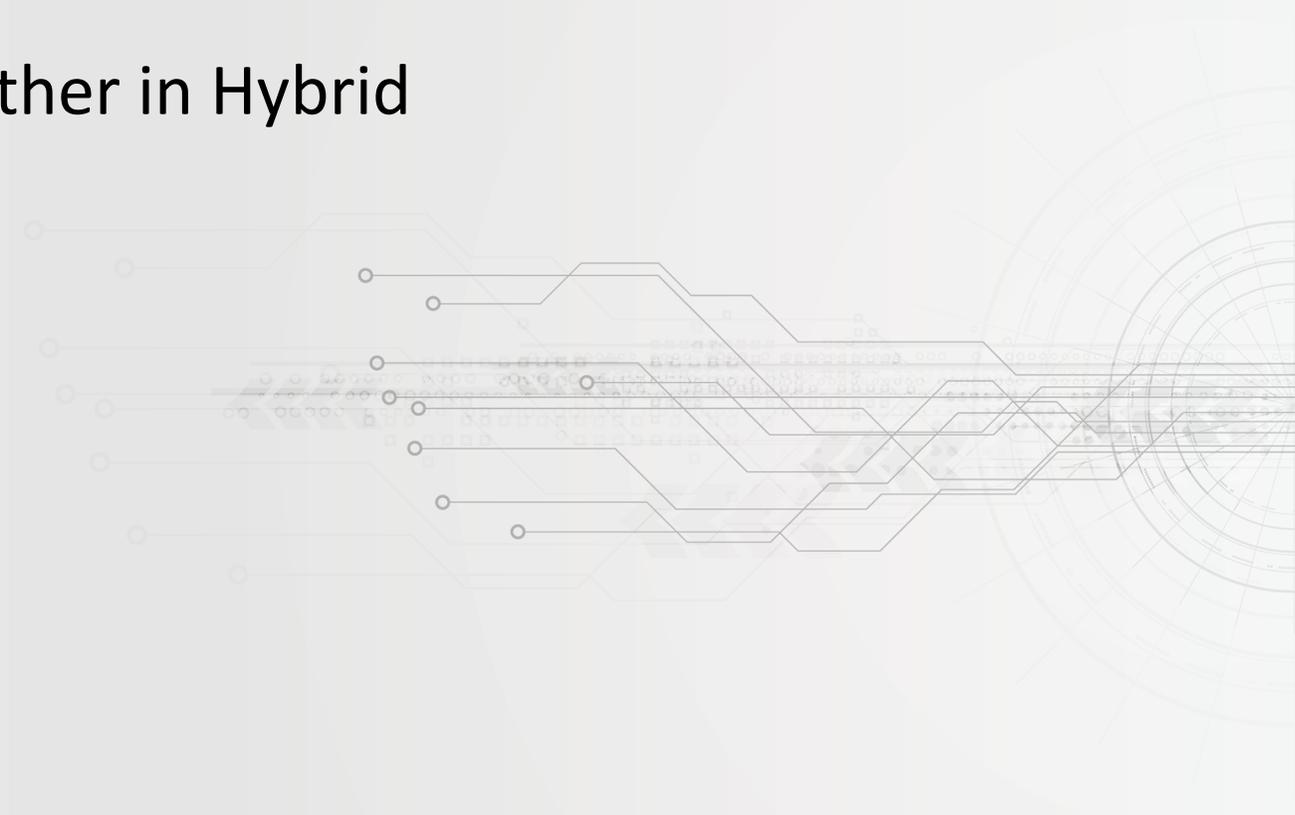
Ryan Straus





# Overview

- Consensus Mechanism Review // Motivation
- How Mining & Staking Work Together in Hybrid
- The Staking Mechanism
- PAI Coin Pool
- Milestones & Timeline





# What is a Consensus Mechanism?

A **Consensus Mechanism** is a set of rules by which all participants in a decentralized process can come to **agreement**.



# Why is a Consensus Mechanism needed?



Blockchains are **decentralized**, meaning no central authority (e.g., a bank) authorizes or verifies transactions that happen. The Consensus Mechanism **guides all peers** in the network on **how to coordinate** in place of a central authority.



# How does a Consensus Mechanism work?



The Consensus Mechanism allows **all the nodes/peers** in the network to **work together** to determine which transactions are valid, and which are not.

(As long as **most peers are honest** and not colluding.)

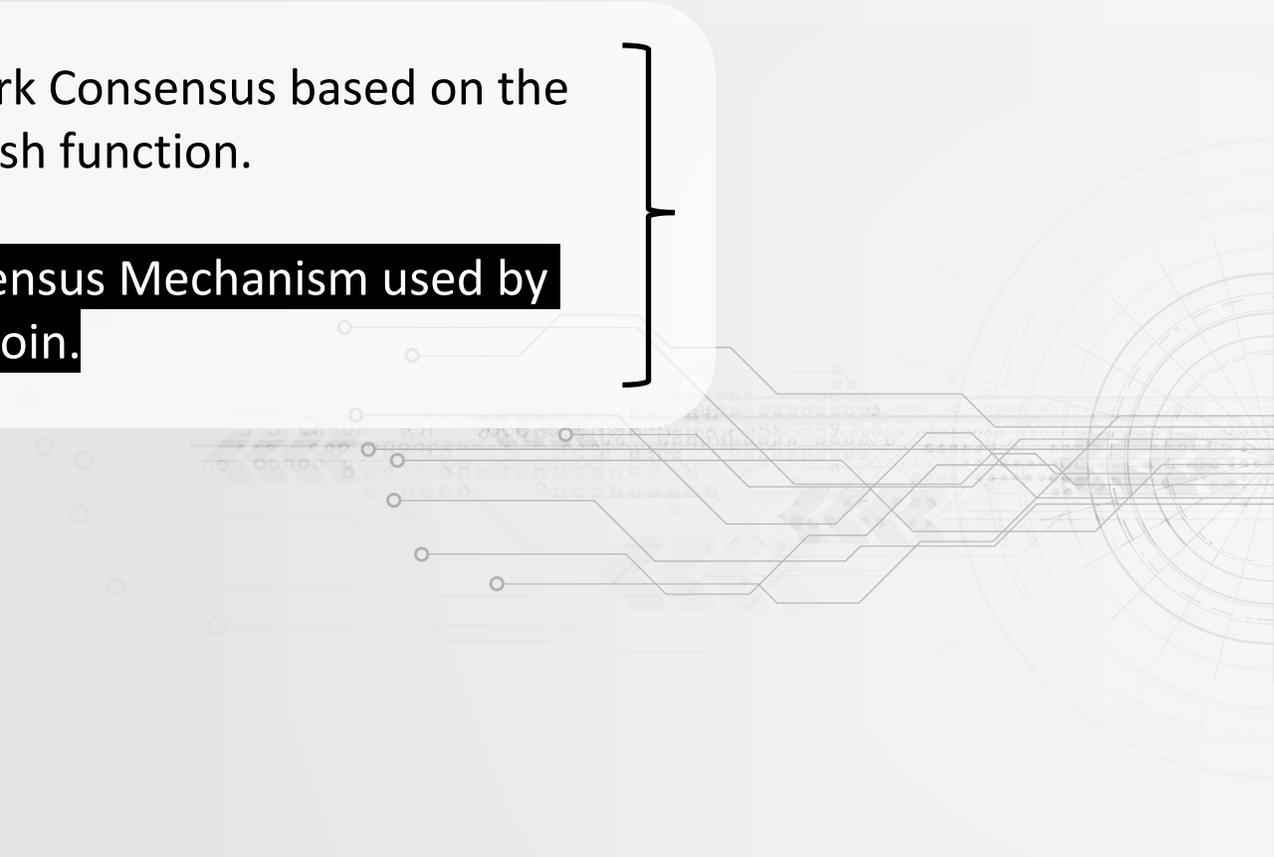


# What Consensus Mechanism does PAI use?



PAI Coin uses Proof-of-Work Consensus based on the SHA-256 hash function.

**It is the exact same Consensus Mechanism used by Bitcoin.**



# Implications of using BTC Consensus



- All existing BTC mining equipment is compatible with PAI Coin.
- **The current hash rate of the PAI Blockchain is 120 TH/s; this is equivalent to just three Bitmain Antminer S17s or only one Antminer S19 Pro.**
- With just a few of these devices, a bad actor could corrupt the PAI Blockchain.

# How can PAI's vulnerability be addressed?

1

Make PAI Coin incompatible with Bitcoin mining  
>\_ to eliminate a significant attack vector.

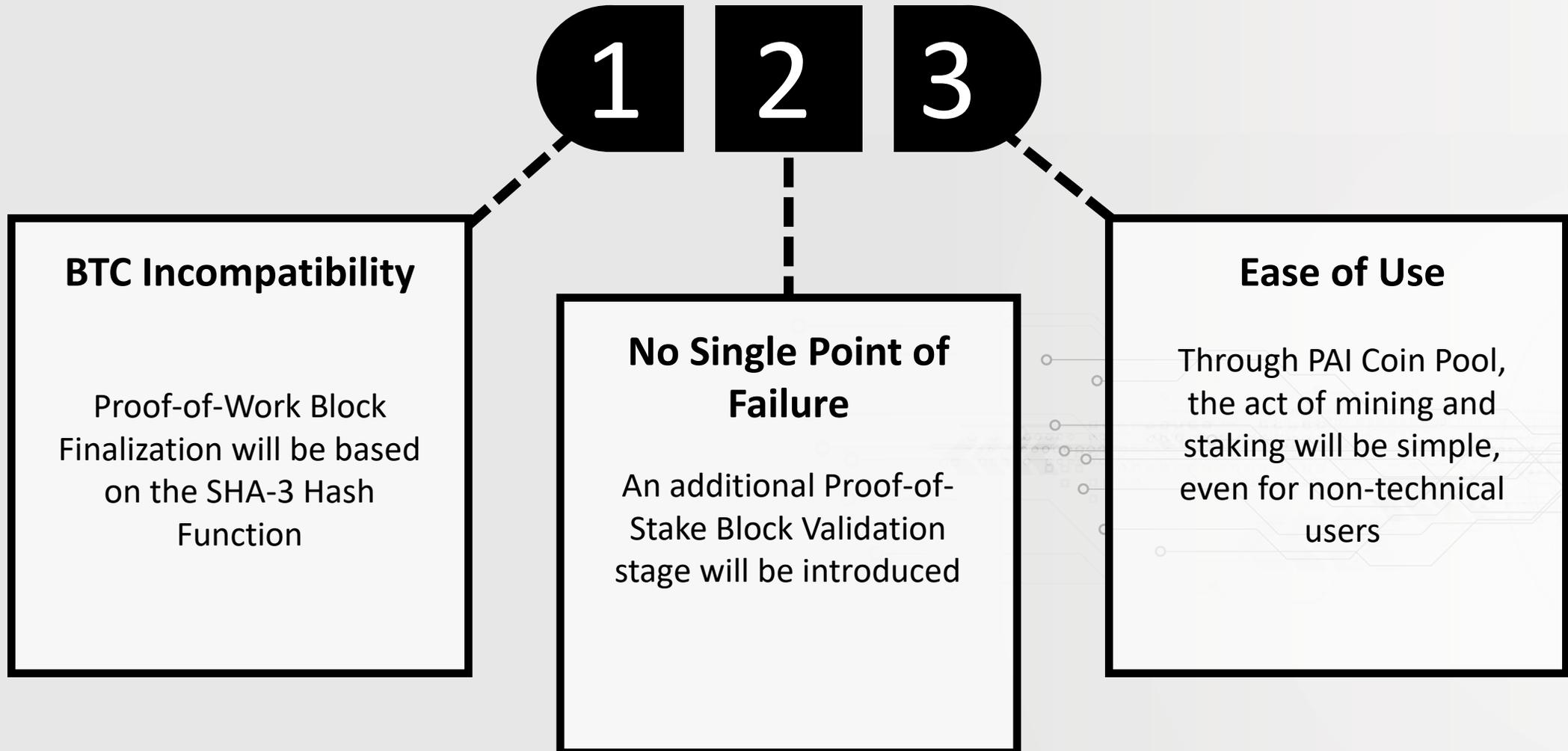
2

Use multiple forms of transaction verification  
>\_ to ensure no “single point of failure”.

3

Ensure ease of accessibility for end users  
>\_ to promote adoption and participation.

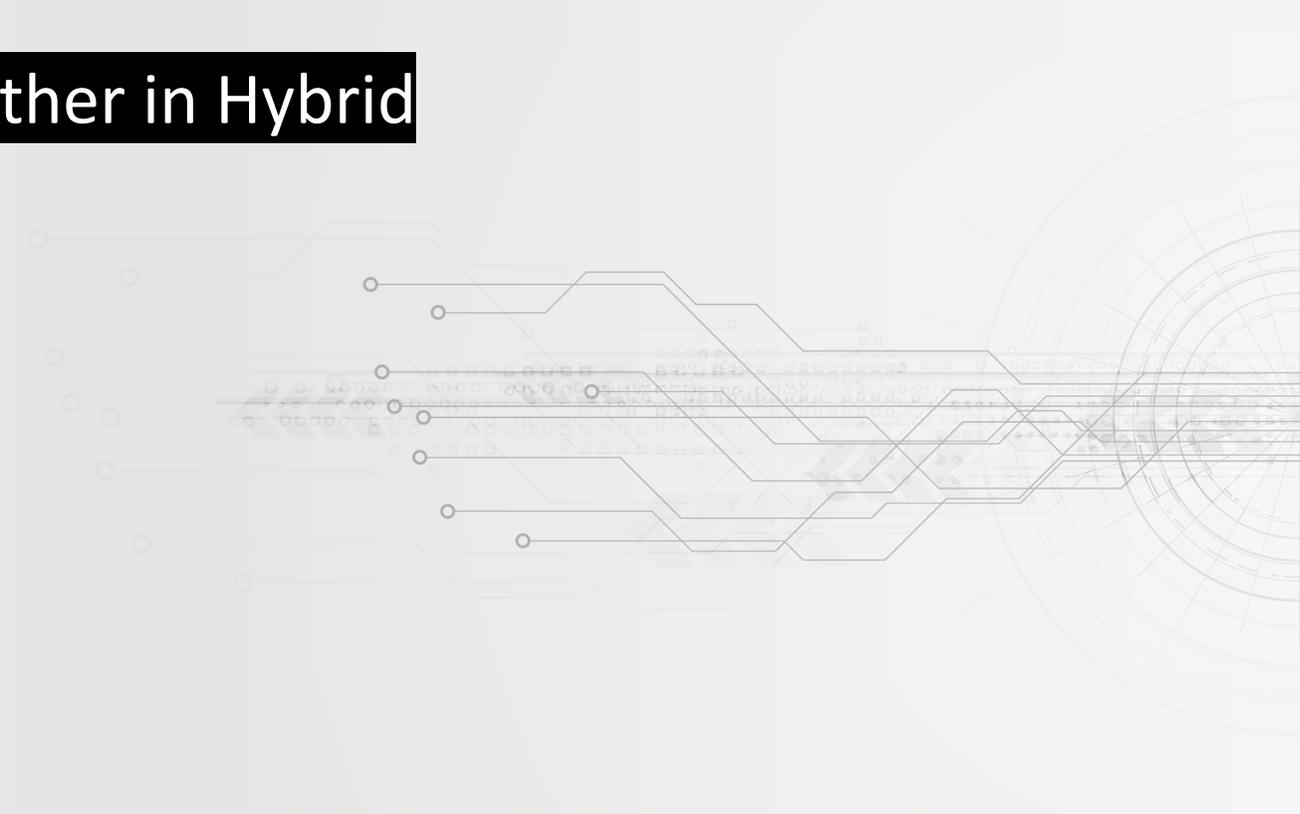
# Hybrid Consensus addresses all three criteria



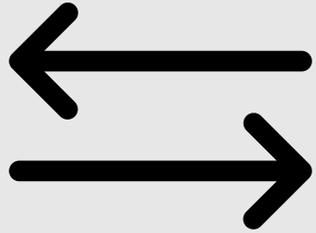


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# How a Block is formed in Hybrid PoW/PoS



## Block Construction

Miners construct blocks by populating them with pending transactions in the mempool. If there are no pending transactions, an empty block can be constructed.



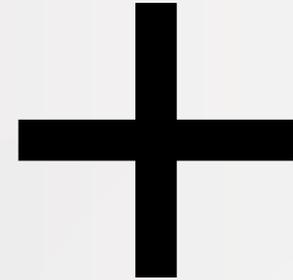
## Block Finalization

The miner must finalize the block by hashing together the block's contents with a random number that produces a hash in the network's current target range.



## Block Validation

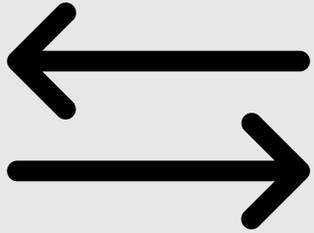
The finalized block is broadcast on the network for other nodes to analyze and validate. Individual nodes can reject the block if errors are found in its contents.



## Block Acceptance

In the following block, stakeholders will vote on the validity of the block. This is a second validation step in which only stakeholders can participate.

# How a Block is formed in Hybrid PoW/PoS



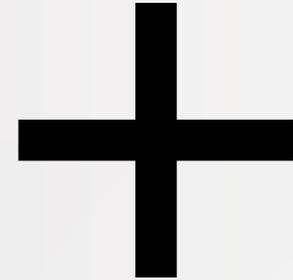
Block Construction



Block Finalization



Block Validation



Block Acceptance

## Proof of Work

**(PoW)**

- Identical to current PoW mechanism following.
- SHA-256 hash function is replaced by SHA-3.
- Difficulty readjustment algorithm of Bitcoin Cash is adopted.

## Proof of Stake

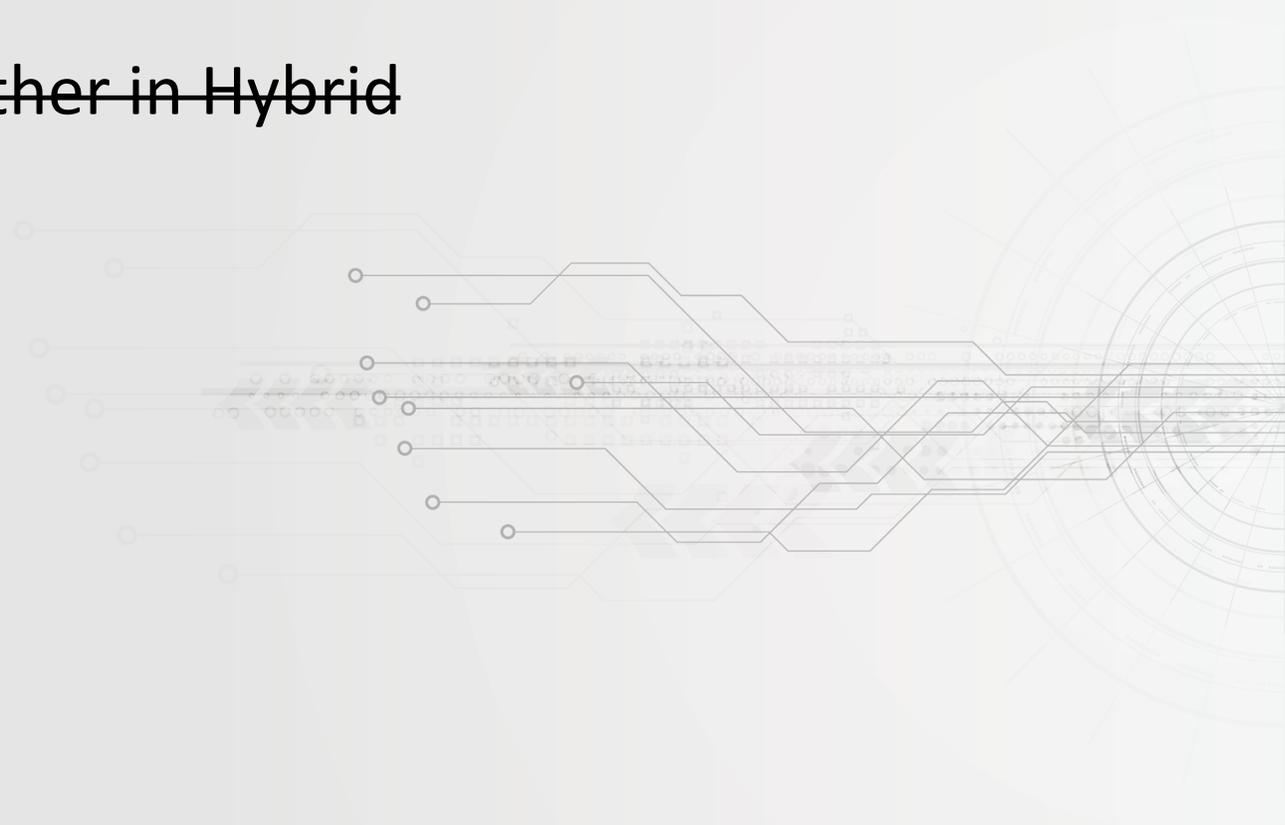
**(PoS)**

- Inspired by the DCR (PoW/PoS hybrid) mechanism.
- Stakers will be awarded stake vouchers.
- Holders of stake vouchers will be chosen at random to vote on new blocks.



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# How Staking Works

- Staking is based on the notion of purchasing **stake vouchers**.
- Vouchers have a variable cost which is set automatically by the network in response to demand.
- When you choose to stake, you are **purchasing 1 or more vouchers**.
- Based on current staking activity, the price of a voucher would be **approximately 1617 PAI**.



# How Staking Works

- Every time a miner constructs & finalizes a candidate block, the network randomly chooses **five stake vouchers** to include in it, to vote on the previous block's validity.
- The probability of being chosen to vote is directly proportional to **the number of valid stake vouchers you own** (i.e., the amount of PAI Coin you've staked), relative to the total number of valid stake vouchers on the network.
- **Stake Vouchers remain valid for a certain number of blocks** which equates to approximately 284 days.



# How Staking Works – Example [1/3]

- ▶ **Alice** purchases 100 Stake Vouchers at a price of 1500 PAI Coin each, for a total cost of 150,000 PAI Coin. **This is equivalent to staking 150,000 PAI Coin.**
- ▶ Assuming there are 40,000 valid Stake Vouchers on the network (60MM PAI Coin staked), **Alice has a 1.25% chance of being chosen to vote** each time a new block is mined.
- ▶ In this case, **Alice's 100 Stake Vouchers will remain valid for 40,960 blocks (about 284 days)**, and there is a virtually 100% chance one of her vouchers will be chosen to vote in that amount of time



# How Staking Works – Example [2/3]

- ▶ When one of Alice's **stake vouchers is chosen to vote**, the PAI Coin node she is running automatically votes to accept or reject it according to Alice's instructions.
- ▶ **Regardless of how she votes, if the block is appended to the blockchain**, Alice earns  $1/3^{\text{rd}}$ ,  $1/4^{\text{th}}$ , or  $1/5^{\text{th}}$  the portion of the block reward allocated to stakers (depending on if 3, 4, or all 5 stakeholders vote).
- ▶ Alice's staked funds are released back to her once she votes or her vouchers expire, whichever occurs first. If she voted successfully, **she would also be sent her fraction of the block reward**, in addition to the amount she originally staked.



# How Staking Works – Example [3/3]

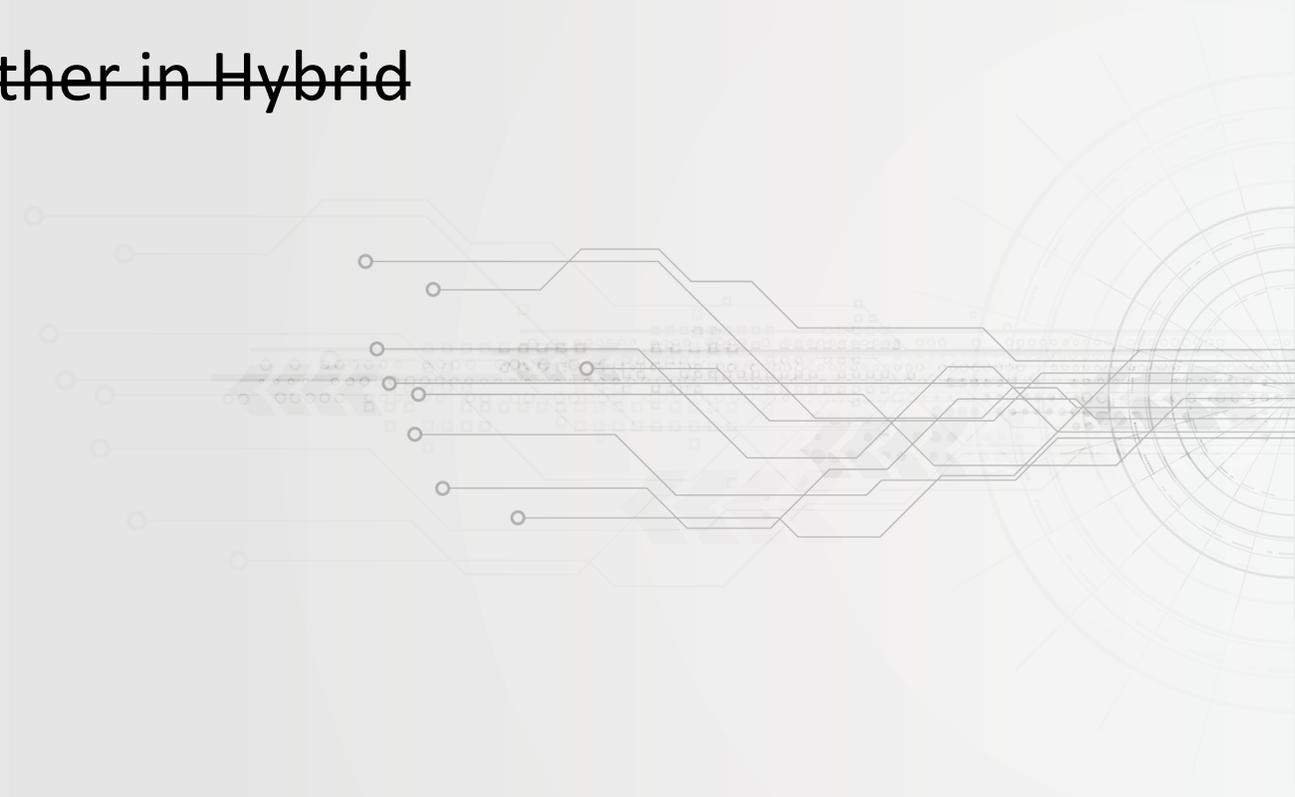
- Once Alice's staked funds are returned (whether she successfully voted or not), they are immediately **available to stake again**, if desired.
- PAI Coin Pool will facilitate **automatic voucher repurchasing** based on the total amount of time the user indicates they'd like to stake.





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# PAI Coin Pool – Staking By Proxy

Add a Staked Balance  
16868.13 PAI available to stake

Amount  
15000 PAI

26 Weeks

Staked Balance	15000 PAI
Estimated Final Balance	15075.76 PAI
Estimated Yield	0.51%

*The yield and final balance are estimates and depend on pool participation over time. There is no guarantee this is the amount you will receive when the stake matures.*

[Cancel](#) [Next](#)

- In **PAI Coin Pool**, you will still be able to stake virtually any amount for any amount of time between 2 weeks and 1 year.
- By pooling together all the staked funds, **PCP will act as a proxy** for pool users by purchasing & perpetually repurchasing Stake Vouchers on their behalf, then forwarding on the block rewards to the end users.

# PAI Coin Pool – Individual Stake Vouchers



Add a Staked Balance  
16868.13 PAI available to stake

Amount  
15000 PAI

26 Weeks

Staked Balance	15000 PAI
Estimated Final Balance	15075.76 PAI
Estimated Yield	0.51%

*The yield and final balance are estimates and depend on pool participation over time. There is no guarantee this is the amount you will receive when the stake matures.*

Cancel Next

- **It would also be possible** to allow PCP users to purchase individual stake vouchers themselves.
- In this case,
  - **[a]** Stake amounts would have to be multiples of the current Stake Voucher price, &
  - **[b]** The user would not be able to specify the length of time to stake for, &
  - **[c]** The user would not be able to cancel the stake.



# PAI Coin Pool – We Need Your Help!

Add a Staked Balance  
16868.13 PAI available to stake

Amount  
15000 PAI

26 Weeks

Staked Balance 15000 PAI  
Estimated Final Balance 15075.76 PAI  
Estimated Yield 0.51%

*The yield and final balance are estimates and depend on pool participation over time. There is no guarantee this is the amount you will receive when the stake matures.*

Cancel Next



- We encourage designers in the PAI Community to **submit UI design proposals for PAI Coin Pool** with Hybrid Consensus.
- How should **staking vouchers** be presented to users?
- What type of design will make the UX efficient and **easy to use**?
- Any new features that would be useful?
- **Good proposals will be rewarded with PAI Coin. (Please discuss details with your community leader.)**

# Preview of PAIchain.info for Hybrid



PAI Coin Mainnet [Explorer](#) [Movement](#) [Network](#) [Mempool](#) [Rich list](#)

Network (TH/s): 191.3055

Difficulty: 36,587,172.819



Coin Supply (PAI): 1,682,881,500

PAI Price (USD): 0.015526263035

You may enter a block height, block hash, tx hash or address. [Search](#)

← PAI block: 00000000000003686edf2b2f617e56f39b32541dd41d5922941f5e18dfa7bb6 ⓘ

Height	Difficulty	Confirmations	Size (kB)	Bits	Nonce	Timestamp
141575	36587172.8185	1	2.368	19756360	1543719604	Fri, 26 Jun 2020 17:39:40 GMT

Regular Transactions

Transaction ID	Recipients	Amounts (PAI)	
<a href="#">176b7465a272490f7bc867b9061c38249ff182aee0d66b72ded84b5fd09bb53a</a>	2	333333.99995400	
<a href="#">690ac4433feb1d4acc87363c268fca87a8acd8f7a4ef9591a62bccb951238f2e</a>	2	23454.01138549	
<a href="#">6f8b4230c91a4c471ad14006b351ba1c190789fa71db8d9eca3812a626c72d13</a>	1	1500.00025572	
<a href="#">78afdb5fc04263df509886d30246c0d26d6e8ddd6f078a50a1ff20dd0</a>	2	491666.66995400	

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141921 blocks 8 connections

# Preview of PAIchain.info for Hybrid



PAI Coin Mainnet [Explorer](#) [Movement](#) [Network](#) [Mempool](#) [Rich list](#)

### Votes (For Previous Block)

Vote ID	Vote	Stake Voucher Amount (PAI)	
<a href="#">176b7465a272490f7bc867b9061c38249ff182aee0d66b72ded84b5fd09bb53a</a>	Accept	1615.35774	
<a href="#">690ac4433feb1d4acc87363c268fca87a8acd8f7a4ef9591a62bccb951238f2e</a>	Accept	1609.641884	
<a href="#">6f8b4230c91a4c471ad14006b351ba1c190789fa71db8d9eca3812a626c72d13</a>	Accept	1598.234	
<a href="#">78afdb5fc04263df509886d30246c0d26d6e8ddd6f078a50a1ff20dd0d449a64</a>	Reject	1631.428781	
<a href="#">81a7e0703d9a721ce4d428b71ca266491c479d2de6f66b27b0b7bce1ca550b56</a>	Accept	1584.93994	

### Stake Vouchers

Stake Voucher ID	Amount (PAI)	Inputs/Outputs	
<a href="#">176b7465a272490f7bc867b9061c38249ff182aee0d66b72ded84b5fd09bb53a</a>	1615.35774	2/5	
<a href="#">690ac4433feb1d4acc87363c268fca87a8acd8f7a4ef9591a62bccb951238f2e</a>	1615.35774	1/3	
<a href="#">6f8b4230c91a4c471ad14006b351ba1c190789fa71db8d9eca3812a626c72d13</a>	1615.35774	2/5	
<a href="#">78afdb5fc04263df509886d30246c0d26d6e8ddd6f078a50a1ff20dd0d449a64</a>			

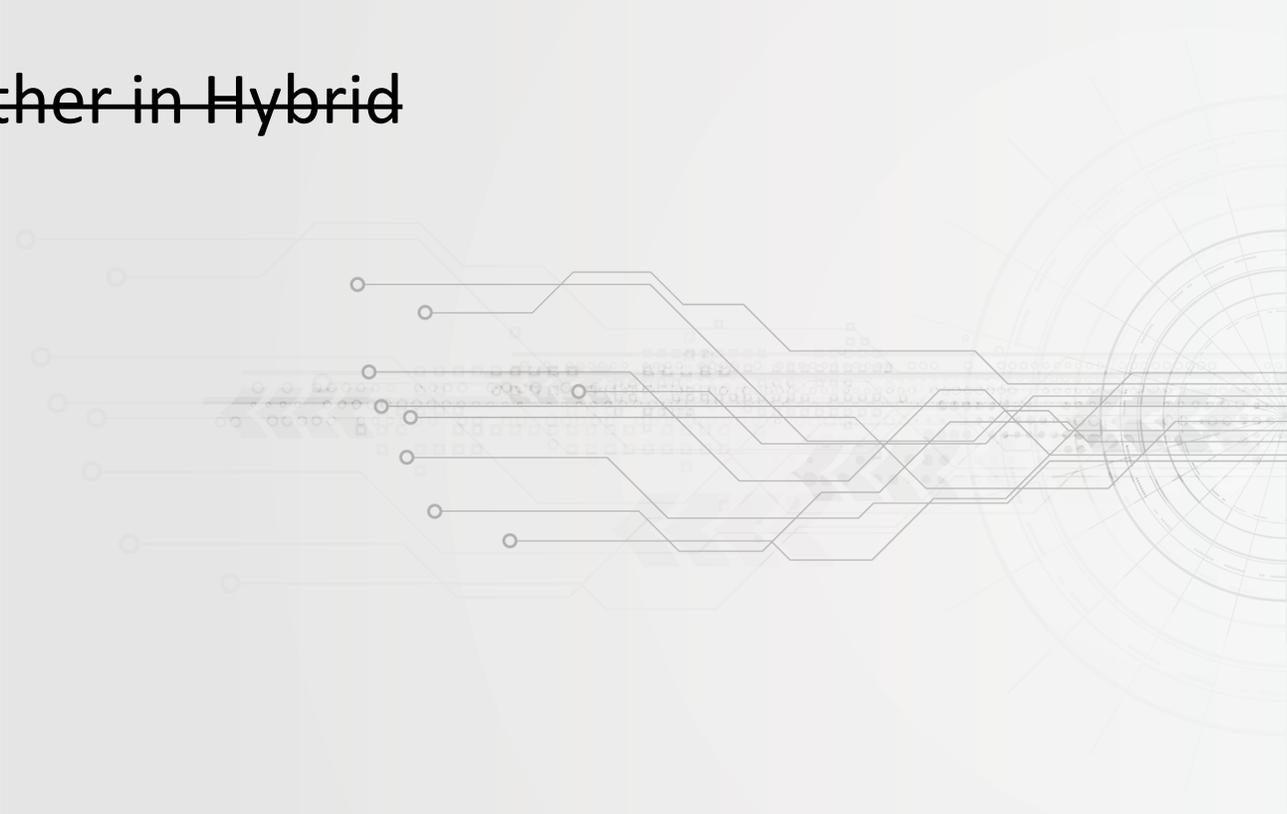
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141921 blocks 8 connections



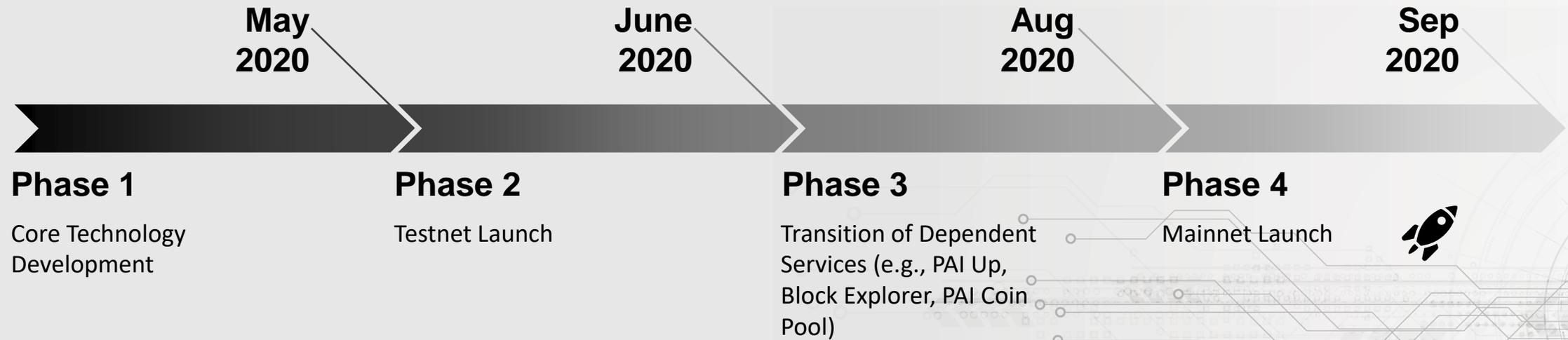
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# Milestones & Timeline



Introduced in the [April 20 Newsletter](#)



# Reminder!

- **Join the community:** Make sure you've signed up for PAI Forum and PAI Coin Pool!
- **Voice your opinion:** Use PAI Forum to submit your feedback on Project PAI, to ask questions and discuss interesting ideas.
- **Spread the word:** Share PAI Forum announcements about Hybrid with your friends and colleagues, so that everyone knows what's coming!



# Ongoing Development

- Check out the **hybrid-consensus** branch of the official paicoins repository on GitHub to see all the latest development!

>> <https://github.com/projectpai/paicoins/tree/hybrid-consensus>





**Thank  
you!**

