

RChain Validator Sale and Staking Economic Detail



Sale commencing September 2018 through Main-net launch

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Disclaimer:: This document is a living document and may be subject to revisions and updates. In particular, we will continually update the FAQ section as we receive more questions. The most current version of this document will be posted at <https://github.com/rchain/legaldocs/tree/master/validator-sale> . RChain will also notify potential and current node validators of any revisions

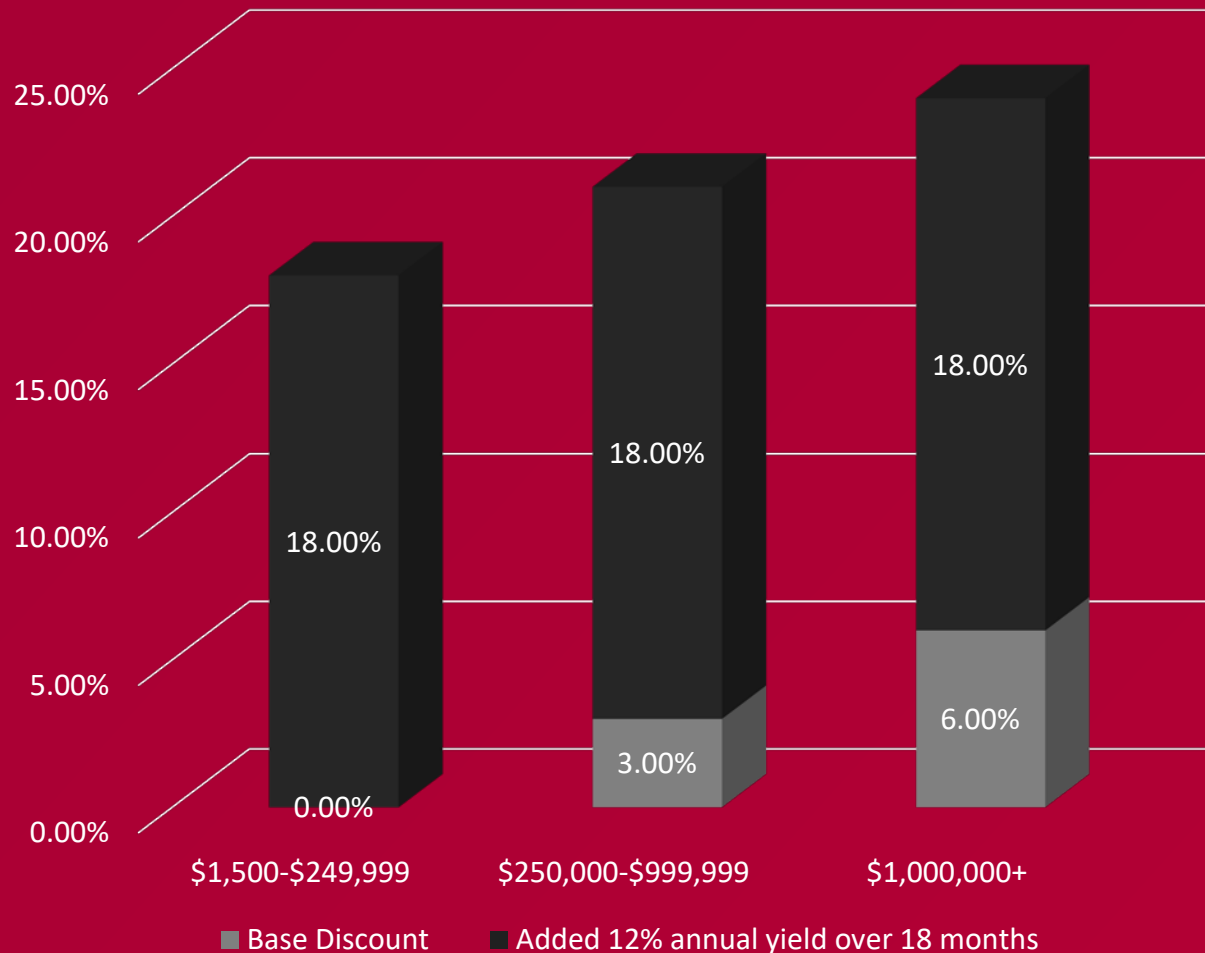
Pricing and Reward Principles Summary



- Economics will flow to validators from 3 key sources
 - Discounts
 - This is offered to incentivize participation in securing the RChain network
 - A pricing discount scaling based on size will be offered to participants in the validator sale
 - Existing RHOC holders who sign the contract with a 6 month lockup will be made whole
 - Seigniorage / Interest
 - This is offered to bootstrap the network during the early days as Tx volumes are expected to grow over time, but will be lower at launch given the network is incipient
 - This will be paid monthly at an annual 7% rate for the first 18 months from main-net launch
 - In addition the same rate will be offered through the test-net period incentivizing securing the network during the test phase
 - This will be sent to an unbonded wallet and will be collectible roughly every month
 - Tx Fees / Storage
 - Validators will also receive fees based on Tx Fees and Storage
 - Values are TBD, but the goal is to offer significantly reduced rates versus other protocols, ensured via RChain's differentiated scalability and throughput
 - Over time we expect this to become a more significant part of economics versus Seigniorage / Interest

Discounts

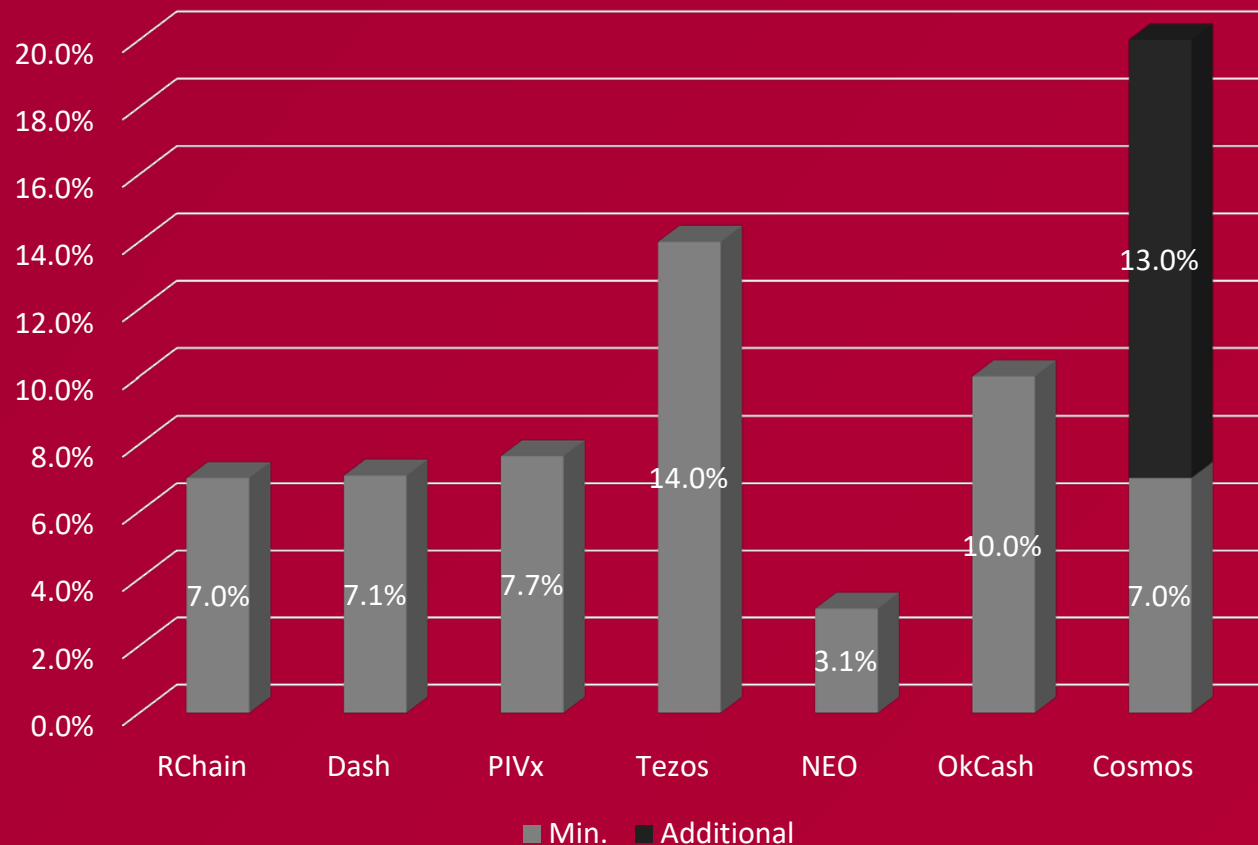
Purchase discount



- The purchase discount consists of 2 elements
 - A base discount of 0-6% based on size of purchase
 - An added discount of 18% will be added in exchange for committing to a 6 month lockup ("lockup" refers to a 6 month lockup from the date of main-net launch)
- Existing RHOC holders that sign the contract and commit to a 6 month lock-up period against validation, will receive tokens equivalent to this discount commensurate with the size of the stake they lock-up
 - These will be deposited into a co-op controlled wallet and will be distributed at the time of bonding
- The discount will be relative to spot price at close, as determined by 2 week trading average on coinmarketcap
- We believe these discount incentives are in line with the commitments being requested from validators

Seigniorage / Interest

Staking Yield*



*Staking schematics / methods vary by project

- In addition we will provide a 7% annualized seigniorage payment to validators out of additional issuance. This is consistent with ongoing yield at other projects
 - This will be in an unbonded wallet external to the bonding wallet that holds your stake
 - Payment will be made ~monthly and will be commensurate with the amount in the bonded wallet
 - Payments can be moved/spent ~monthly, the system will shorten the period based on past monthly rolling average of Tx volume. I.e., continually increasing transaction volumes, lead to disbursements that occur more frequently than every month and vice versa

Return Example (1)

Starting Conditions

Discount tranches	Start	End	% Discount	Segniorage Rate (year 0-1.5)	Effective monthly simple rate
Low Stakes	1500	249,999	8.00%	7.00%	0.57%
Medium Stakes	250,000	999,999	21.00%	7.00%	0.57%
High Stakes	1,000,000	1,000,000	24.00%	7.00%	0.57%

Committed dollar amount	2,000,000
RHOC / REV Price at sale close	0.40
Discount applied	24.00%
Discounted RHOC / REV Price	0.30
RHOC / REV Delivered during sale	6,578,947
RHOC / REV Monthly Price Increase during staking	0.00%

18 Month Return Calculation

Date (start from today)	\$ Inflow	RHOC / REV Held in bonded wallet (B.O.P)	RHOC / REV added through Segniorage	RHOC / REV Held in bonded wallet (E.O.P)	\$ Outflow	RHOC / REV Price (During the month)	Total Cash Flow (Actual)
8/ 27/ 2018	2,000,000	-	-	6,578,947	-	0.40	(2,000,000)
9/ 27/ 2018	0	6,578,947	37,988	6,578,947	14,879	0.40	14,879
10/ 27/ 2018	0	6,578,947	37,988	6,578,947	14,879	0.40	14,879
11/ 27/ 2018	0	6,578,947	37,988	6,578,947	14,879	0.40	14,879
12/ 27/ 2018	0	6,578,947	37,988	6,578,947	14,879	0.40	14,879
1/ 27/ 2019	0	6,578,947	37,988	6,578,947	14,879	0.40	14,879
2/ 27/ 2019	0	6,578,947	37,988	6,578,947	14,879	0.40	14,879
3/ 27/ 2019	0	6,578,947	37,988	6,578,947	14,879	0.40	14,879
4/ 27/ 2019	0	6,578,947	37,988	6,578,947	14,879	0.40	14,879
5/ 27/ 2019	0	6,578,947	37,988	6,578,947	14,879	0.40	14,879
6/ 27/ 2019	0	6,578,947	37,988	6,578,947	14,879	0.40	14,879
7/ 27/ 2019	0	6,578,947	37,988	6,578,947	14,879	0.40	14,879
8/ 27/ 2019	0	6,578,947	37,988	6,578,947	14,879	0.40	14,879
9/ 27/ 2019	0	6,578,947	37,988	6,578,947	14,879	0.40	14,879
10/ 27/ 2019	0	6,578,947	37,988	6,578,947	14,879	0.40	14,879
11/ 27/ 2019	0	6,578,947	37,988	6,578,947	14,879	0.40	14,879
12/ 27/ 2019	0	6,578,947	37,988	6,578,947	14,879	0.40	14,879
1/ 27/ 2020	0	6,578,947	37,988	6,578,947	14,879	0.40	14,879
2/ 27/ 2020	0	6,578,947	37,988	6,578,947	14,879	0.40	2,646,468

Internal rate of Return 29.65%
Dollar Demoninated Return 899,407
MoM 145x

- Members of the high stakes/professional tranche will see a true Cash flow IRR of ~30% on the RHOC purchase prior to any Tx /Storage Fees
- This is a “locked in” return and does not depend on price appreciation of the token or a specific quantum of transactions
- Please use (or request) the “RChain Validator Sale and Staking Detail” spreadsheet for the ability to run return simulations on your own

Return Example (2)

Starting Conditions					
Discount tranches	Start	End	% Discount	Segniorage Rate (year 0-1.5)	Effective monthly simple rate
Low Stakes	1500	249,999	8.00%	7.00%	0.57%
Medium Stakes	250,000	999,999	2100%	7.00%	0.57%
High Stakes	1,000,000	1,000,000	2400%	7.00%	0.57%

Committed dollar amount	500,000
RHOC/ REV Price at sale close	0.40
Discount applied	2100%
Discounted RHOC/ REV Price	0.32
RHOC/ REV Delivered during sale	1582,278
RHOC/ REV Monthly Price Increase during staking	0.00%

18 Month Return Calculation							
Date (start from today)	\$ Inflow	RHOC / REV Held in bonded wallet (B.O.P)	RHOC / REV added through Segniorage	RHOC / REV Held in bonded wallet (E.O.P)	\$ Outflow	RHOC / REV Price (During the month)	Total Cash Flow (Actual)
8/ 27/ 2018	500,000	-	-	1582,278	-	0.40	(500,000)
9/ 27/ 2018	0	1582,278	8,946	1582,278	3,579	0.40	3,579
10/ 27/ 2018	0	1582,278	8,946	1582,278	3,579	0.40	3,579
11/ 27/ 2018	0	1582,278	8,946	1582,278	3,579	0.40	3,579
12/ 27/ 2018	0	1582,278	8,946	1582,278	3,579	0.40	3,579
1/ 27/ 2019	0	1582,278	8,946	1582,278	3,579	0.40	3,579
2/ 27/ 2019	0	1582,278	8,946	1582,278	3,579	0.40	3,579
3/ 27/ 2019	0	1582,278	8,946	1582,278	3,579	0.40	3,579
4/ 27/ 2019	0	1582,278	8,946	1582,278	3,579	0.40	3,579
5/ 27/ 2019	0	1582,278	8,946	1582,278	3,579	0.40	3,579
6/ 27/ 2019	0	1582,278	8,946	1582,278	3,579	0.40	3,579
7/ 27/ 2019	0	1582,278	8,946	1582,278	3,579	0.40	3,579
8/ 27/ 2019	0	1582,278	8,946	1582,278	3,579	0.40	3,579
9/ 27/ 2019	0	1582,278	8,946	1582,278	3,579	0.40	3,579
10/ 27/ 2019	0	1582,278	8,946	1582,278	3,579	0.40	3,579
11/ 27/ 2019	0	1582,278	8,946	1582,278	3,579	0.40	3,579
12/ 27/ 2019	0	1582,278	8,946	1582,278	3,579	0.40	3,579
1/ 27/ 2020	0	1582,278	8,946	1582,278	3,579	0.40	3,579
2/ 27/ 2020	0	1582,278	8,946	1582,278	3,579	0.40	636,490

Internal rate of Return	26.17%
Dollar Demoninated Return MoM	197,326 139x

- Members of the medium stakes / business tranche will see a true Cash flow IRR of ~26% on the RHOC purchase prior to any Tx /Storage Fees
- This is a “locked in” return and does not depend on price appreciation of the token or a specific quantum of transactions
- Please use (or request) the “RChain Validator Sale and Staking Detail” spreadsheet for the ability to run return simulations on your own

Return Example (3)

Starting Conditions					
Discount tranches	Start	End	% Discount	Segniorage Rate (year 0-1.5)	Effective monthly simple rate
Low Stakes	1500	249,999	8.00%	7.00%	0.57%
Medium Stakes	250,000	999,999	2100%	7.00%	0.57%
High Stakes	1000,000	1,000,000	2400%	7.00%	0.57%
Committed dollar amount	200,000				
RHOC/ REV Price at sale close	0.40				
Discount applied	8.00%				
Discounted RHOC/ REV Price	0.33				
RHOC/ REV Delivered during sale	609,756				
RHOC/ REV Monthly Price Increase during staking	0.00%				

18 Month Return Calculation							
Date (start from today)	\$ Inflow	RHOC / REV Held in bonded wallet (B.O.P)	RHOC / REV added through Segniorage	RHOC / REV Held in bonded wallet (E.O.P)	\$ Outflow	RHOC / REV Price (During the month)	Total Cash Flow (Actual)
8/ 27/ 2018	200,000	-	-	609,756	-	0.40	(200,000)
9/ 27/ 2018	0	609,756	3,448	609,756	1379	0.40	1379
10/ 27/ 2018	0	609,756	3,448	609,756	1379	0.40	1379
11/ 27/ 2018	0	609,756	3,448	609,756	1379	0.40	1379
12/ 27/ 2018	0	609,756	3,448	609,756	1379	0.40	1379
1/ 27/ 2019	0	609,756	3,448	609,756	1379	0.40	1379
2/ 27/ 2019	0	609,756	3,448	609,756	1379	0.40	1379
3/ 27/ 2019	0	609,756	3,448	609,756	1379	0.40	1379
4/ 27/ 2019	0	609,756	3,448	609,756	1379	0.40	1379
5/ 27/ 2019	0	609,756	3,448	609,756	1379	0.40	1379
6/ 27/ 2019	0	609,756	3,448	609,756	1379	0.40	1379
7/ 27/ 2019	0	609,756	3,448	609,756	1379	0.40	1379
8/ 27/ 2019	0	609,756	3,448	609,756	1379	0.40	1379
9/ 27/ 2019	0	609,756	3,448	609,756	1379	0.40	1379
10/ 27/ 2019	0	609,756	3,448	609,756	1379	0.40	1379
11/ 27/ 2019	0	609,756	3,448	609,756	1379	0.40	1379
12/ 27/ 2019	0	609,756	3,448	609,756	1379	0.40	1379
1/ 27/ 2020	0	609,756	3,448	609,756	1379	0.40	1379
2/ 27/ 2020	0	609,756	3,448	609,756	1379	0.40	245,281

Internal rate of Return 22.91%
Dollar Demoninated Return 68,726
MoM 134x

- Members of the low stakes / enthusiast tranche will see a true Cash flow IRR of ~23% on the RHOC purchase prior to any Tx /Storage Fees
- This is a “locked in” return and does not depend on price appreciation of the token or a specific quantum of transactions
- Please use (or request) the “RChain Validator Sale and Staking Detail” spreadsheet for the ability to run return simulations on your own

Tx Fee Schema

- Each transaction fee is proposed by the originator of the transaction, typically referred to as a “deployer.”
- Fees are split among the validators according to the following equations:
 - $b := (1 + k) * (\text{fee} / (n + k))$
 - $e := \text{fee} / (n + k)$
- Once b and e are determined they will be stake weighted to distribute the fee
- Where:
 - b is the block proposer whose block introduces a transaction
 - e is any validator that is not b
 - n is the number of validators
 - k is a shard-specific “fee structure” parameter
 - fee is the proposed transaction fee
 - This is proposed by the block proposer “ b ”
 - This will be governed by the free market but we are targeting fees at 1/3rd of Ethereum at launch
 - One exception will be storage fees which will be shared evenly across all members
- Notice: when $k=0$, all validators receive the same payment, and in the limit as k tends to infinity only the block proposer receives the entire fee.
- It is expected that for RChain’s root shard, the fee structure parameter k will be low, but that k may be larger in other shards.
- 0.01% of all transaction fees are delivered to certain bonded wallets owned by the RChain Cooperative, in order to help fund maintenance and development of the software and the core network

Stake weighting:

Calculating b and e will provide an Initial weight W_x For Each Validator X

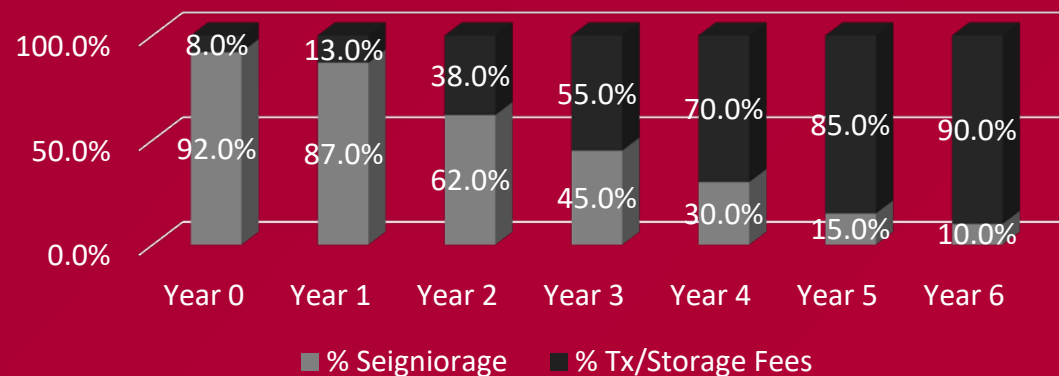
For Each Validator X with stake equal to S_x The final distributed fee will be calculated as

$$\text{fee}_x = \frac{\text{fee} * W_x * S_x}{\sum_{x=1}^n W_x * S_x}$$

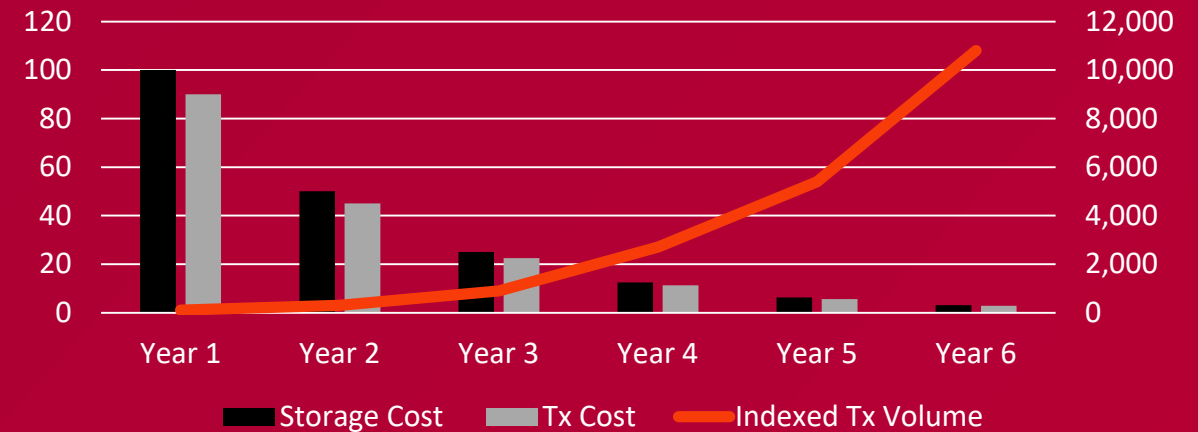
Tx Fee Expectations

- We are seeding economics for validators through the discount and seigniorage
- However as the network grows we expect the volume of transactions to grow rapidly; this should have 2 distinct effects
 - As volume increases, cost per transaction and storage will reduce as capital investments are spread over greater volume

Illustrative Economics Evolution



Illustrative Tx/Storage Fee Evolution



- We expect that over time Tx/ Storage fees will become the main source of ongoing economics versus seigniorage
- Policy will be to maintain outcomes that are neutral to superior economically
- Factors that will be considered while governing this balance are
 - Transaction volume
 - Transaction cost
 - Percent of token supply currently staked

Resources



- Step by step guide to becoming a validator
 - <https://blog.rchain.coop/become-a-validator-and-acquire-rhoc-for-staking/>
- Validator document and contract repo
 - <https://github.com/rchain/legaldocs/tree/master/validator-sale>
- Technical Documentation
 - <https://developer.rchain.coop>

General Questions



This will be continually updated as we receive questions

- Is Bonding an open process? Can it happen at any time? What does it look like?
 - Yes, it's a submitted transaction, as long as the existing validators approve the transaction bonding will occur
- Is there a set commitment period before which stake can be unbonded
 - Yes 6 months
- How long is the up front discount given to existing RHOC holders who commit for 6 months
 - This will extend as long as the validator sale lasts which is expected to occur through the launch of main-net
- Will all shards receive the same level of economic incentive (outside of Tx /Storage fees of course which are shard dependent)?
 - Yes
- Do we want “Backbone” validators to only be in the high stakes pool?
 - Most likely given the proportional cost of hardware to stake

Outstanding Questions - Hardware

This will be continually updated as we receive questions

- When will be able to announce hardware requirements?
 - Specific details will be released during the test phase

Backup on other projects

Staked Min			
Project	(\$)	Yield	Source
DASH	\$235,000	7.07%	https://masternodes.online/currencies/DASH/
PIVX	\$20,000	7.65%	https://masternodes.online/currencies/PIVX/
Tezos		14.00%	https://staked.us/yields/
NEO		3.11%	https://neotogas.com/?p=profit
OkCash		10.00%	https://okcashblockhalf.com/
Cosmos		7-20%	https://cosmos.network/docs/resources/delegator-faq.html#directives-of-delegators