

Work Scheduler

Work

Work is generated from problem definitions stored on the blockchain or created dynamically by listening to blockchain events that emit tasks. This work can be anything and is stored in an indexed list:

0	1	2	3	4	5	6	7	8	9
work	work	work	work	work	work	work	work	work	work

Work Assignment

The following diagram represents the indexes of work to be performed for Epoch 0:

Epoch 0:

0	1	2	3	4	5	6	7	8	9
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Peers can determine what work they are expected to perform based on their Peer Index. The diagram below represents how each peer is assigned work indexes:

Epoch 0:

0	1	2	3	4	5	6	7	8	9
Peer1	Peer2	Peer3	Peer1	Peer2	Peer3	Peer1	Peer2	Peer3	Peer1

Epoch 1:

10	11	12	13	14	15	16	17	18	19
Peer1	Peer2	Peer3	Peer1	Peer2	Peer3	Peer1	Peer2	Peer3	Peer1

We can define this more formally as follows:

Let p represent the set of all peers

Let $\omega_{i,j}$ represent work sequence index i for peer j

Then we can generate work as follows :

$$\omega_{i,j} = \omega_{i-1,j} + j + i * |p|$$

Incomplete Work

Work from peers that go offline before completing latest epoch is redistributed to the remaining peers. This is best explained by considering the following scenario:

Peer 2 drops out of the pubsub room before completing work from Epoch 1

Epoch 1:

10	11	12	13	14	15	16	17	18	19
Peer1	-	Peer3	Peer1	-	Peer3	Peer1	-	Peer3	Peer1

At the start of Epoch 2, Peer3 becomes Peer2 and the incomplete work from Epoch 1 is distributed to the remaining peers.

Epoch 2:

11	14	17							
Peer1	Peer2	Peer1							

The remaining open work is assigned as usual.

Epoch 2:

11	14	17	20	21	22	23	24	25	26
Peer1	Peer2	Peer1	Peer1	Peer2	Peer1	Peer2	Peer1	Peer2	Peer1

Peer Index Assignment

Each peer is assigned a unique id upon joining the pubsub room. When a peer joins/leaves, all peers sort the list of peer IDs. Each peer's index corresponds to the order of their ID in the sorted list. This ensures that all peers agree on the ordering.

Index	1	2	3
ID	A	B	C