Bonus params

Stake difficulty : Determines stake bonus. More difficult corresponds to lower bonus. Used for controlling inflation.

Powered stake multiplier : Determines tokens available for bonus.

Power difficulty : Determines power bonus. More difficult corresponds to lower bonus. Used for controlling inflation.

Power bonus max rate : Determines maximum payout rate for power bonus. Rate is measured in tokens per microsecond. Anything above this rate goes to worker proposal fund.

Min stake : Minimum amount that can be staked. A stake can never be below this amount.

Max powered stake ratio : Maximum percentage of total staked that a single account can have.

Max wpf payout : Maximum amount that can be paid out to the worker proposal fund per call to claim.

Worker proposal fund : Amount in the worker proposal fund before it is transferred to the worker proposal fund proxy account

Worker proposal fund proxy : Account that holds the worker proposal fund tokens

Boidpower params

Boidpower decay rate : Rate of decay for boidpower. Causes boidpower to fall off for inactive accounts.

Boidpower update exp : Exponent to determine the amount that boidpower update contributes to overall boidpower.

Boidpower const decay : Constant decay for boidpower. Boidpower for all boid accounts falls off by this amount every day.

Bonus equations

Powered stake

s : *stake*

s_{pow} : *powered stake*

c_{pow} : *powered stake multiplier*

bp : *boidpower*

$r_{pow,max}$: *max powered stake ratio*

$s_{pow,tot}$: *total stake for all accounts*

$$s_{pow} = min(c_{pow} * bp, r_{pow,max} * s_{pow,tot})$$

Stakebonus

s_{wpf} : *staked amount for worker proposal fund*

c_{stake} : *stake bonus coefficient*

p_{stake} : *stake bonus payout*

p_{wpf} : *worker proposal fund bonus payout*

t_c : *current time*

t_s : *start time*

$$s_{pow} = min(s, s_{pow})$$
$$s_{wpf} = max(s - s_{pow}, 0)$$
$$c_{stake} = (t_c - t_s)/d_{stake}$$
$$p_{stake} = s_{pow} * c_{stake}$$
$$p_{wpf} = min(s_{wpf} * c_{stake}, p_{wpf,max})$$

Powerbonus

c_{pow} : *power bonus coefficient*

p_{pow} : *power bonus payout*

$$c_{pow} = min(bp/d_{pow}, c_{pow,max})$$
$$p_{pow} = c_{pow} * (t_c - t_s)$$

Boidpower equation

bp_{curr} : *current boidpower*

bp_{new} : *boidpower update*

$c_{bp,decayrate}$: *boidpower decay rate*

$c_{bp,update}$: *boidpower update exp*

$c_{bp,decayconst}$: *boidpower const decay*

$$bp = max(bp_{curr} * (1 - c_{bp,decayrate})^{(t_c - t_s)} + bp_{new}^{(1 - c_{bp,update})} - (t_c - t_s)/t_{day} * c_{bp,decayconst}, 0)$$

Boidpower examples

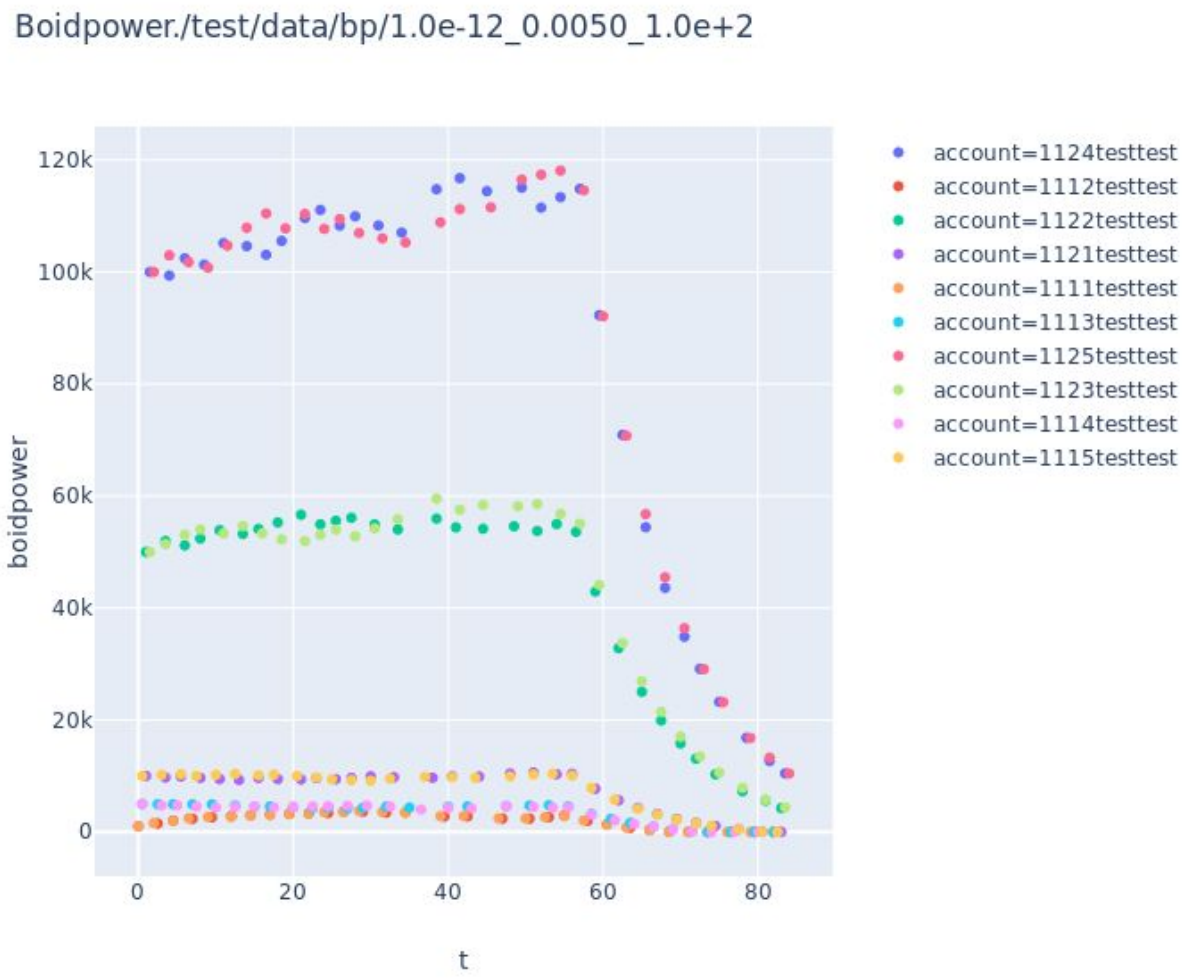
10 test accounts were set up with intial boidpowers between [1000, 100000]. Account boidpowers were updated regularly of the quantity (0.1*initBp*dt/day_length). Graph is measured in days vs boidpower.

decayRate	updateExp	constDecay	
1.00E-12	0.004999999888	100	
account	boidpower	update	t
1111testtest	1000	1000	1569890669
1111testtest	1607.359985	1000	1569890671
1111testtest	2011.163696	1000	1569890673
1111testtest	2458.061035	1000	1569890675
1111testtest	2696.606934	1000	1569890678
1111testtest	2746.949951	1000	1569890681
1111testtest	2929.375977	1000	1569890683
1111testtest	3076.36377	1000	1569890686
1111testtest	3194.797607	1000	1569890688
1111testtest	3290.224365	1000	1569890691
1111testtest	3534.146484	1000	1569890693
1111testtest	3563.651123	1000	1569890695
1111testtest	3764.182861	1000	1569890697

1111testtest	3570.769531	1000	1569890700
1111testtest	3421.517578	1000	1569890703
1111testtest	2835.414307	1000	1569890708
1111testtest	2854.063721	1000	1569890711
1111testtest	2450.751221	1000	1569890715
1111testtest	2427.271973	1000	1569890719
1111testtest	2671.798828	1000	1569890721
1111testtest	2868.82373	1000	1569890724
1111testtest	2061.523682	0	1569890726
1111testtest	1290.822388	0	1569890729
1111testtest	790.0661621	0	1569890732
1111testtest	309.672821	0	1569890735
1111testtest	0	0	1569890737
1111testtest	0	0	1569890740
1111testtest	0	0	1569890742
1111testtest	0	0	1569890745
1111testtest	0	0	1569890748
1111testtest	0	0	1569890751

decayRate	updateExp	constDecay	
1.00E-12	0.004999999888	100	
account	boidpower	update	t
1123testtest	50000	50000	1569890670
1123testtest	51415.37891	10000	1569890672
1123testtest	53101.48047	12500	1569890675
1123testtest	54024.68359	10000	1569890677
1123testtest	53313.49219	12500	1569890680
1123testtest	54630.86328	12500	1569890682
1123testtest	53318.15234	10000	1569890685
1123testtest	52260.44922	10000	1569890687
1123testtest	51952.07813	12500	1569890690
1123testtest	53057.67969	10000	1569890692
1123testtest	53987.83203	10000	1569890694

1123testtest	52800.03516	10000	1569890697
1123testtest	54217.15234	12500	1569890699
1123testtest	55833.79688	15000	1569890702
1123testtest	59513.85547	25000	1569890707
1123testtest	57549.33594	12500	1569890710
1123testtest	58405.15234	15000	1569890713
1123testtest	58175.20313	20000	1569890718
1123testtest	58548.13281	12500	1569890720
1123testtest	56804.11719	12500	1569890723
1123testtest	55069.22656	10000	1569890726
1123testtest	44121.43359	0	1569890728
1123testtest	33747.32422	0	1569890731
1123testtest	26941.54102	0	1569890734
1123testtest	21457.85352	0	1569890736
1123testtest	17039.43359	0	1569890739
1123testtest	13479.33887	0	1569890741
1123testtest	10610.83105	0	1569890744
1123testtest	7888.092773	0	1569890747
1123testtest	5787.028809	0	1569890750
1123testtest	4412.835449	0	1569890752



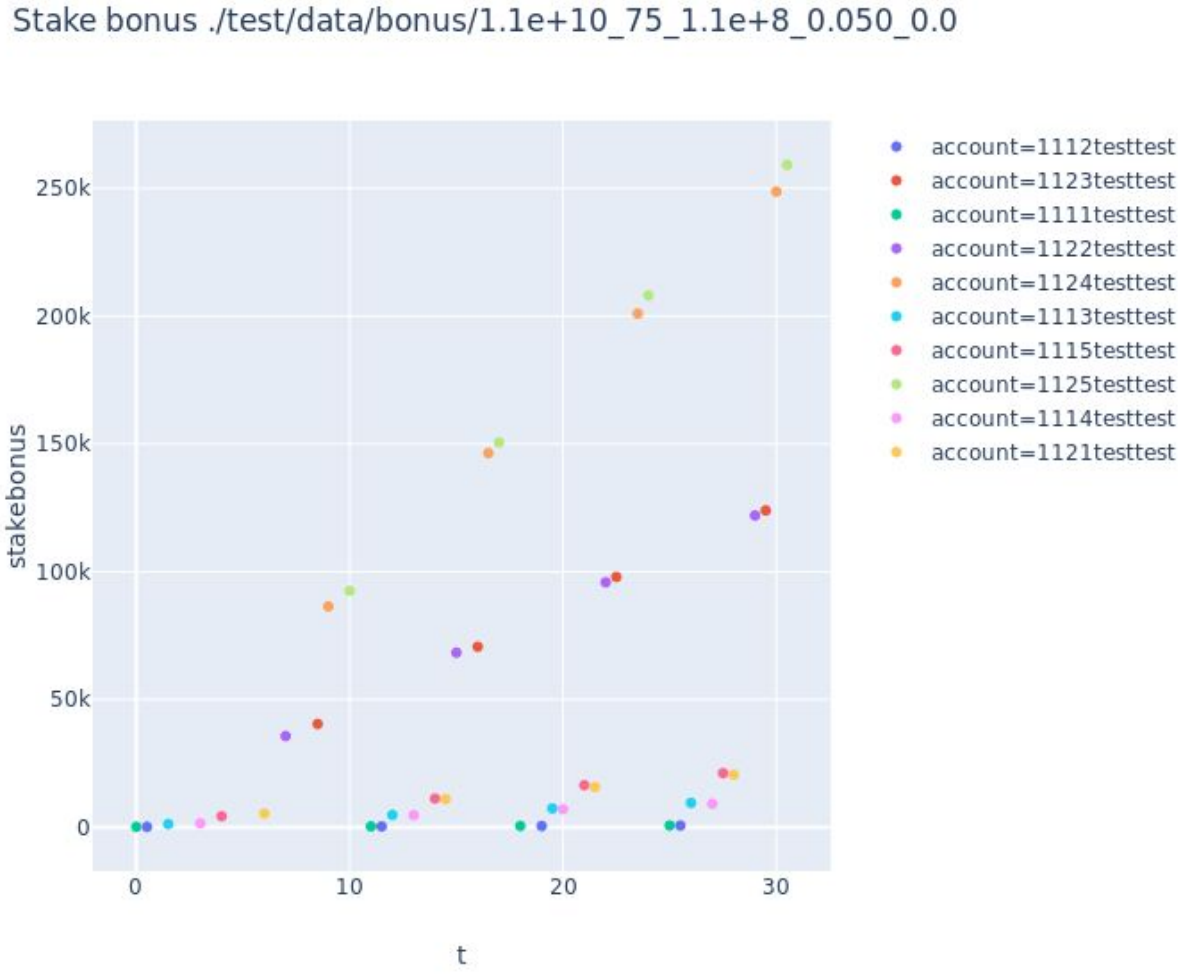
Bonus examples

10 test accounts were set up with intial boidpowers between [1000, 1000000] and initial stakes between [100000,10000000] BOID. Account boidpowers were updated regularly of the quantity (0.1*initBp*dt/day_length). Graphs are measured in days vs boidpower and days vs bonus.

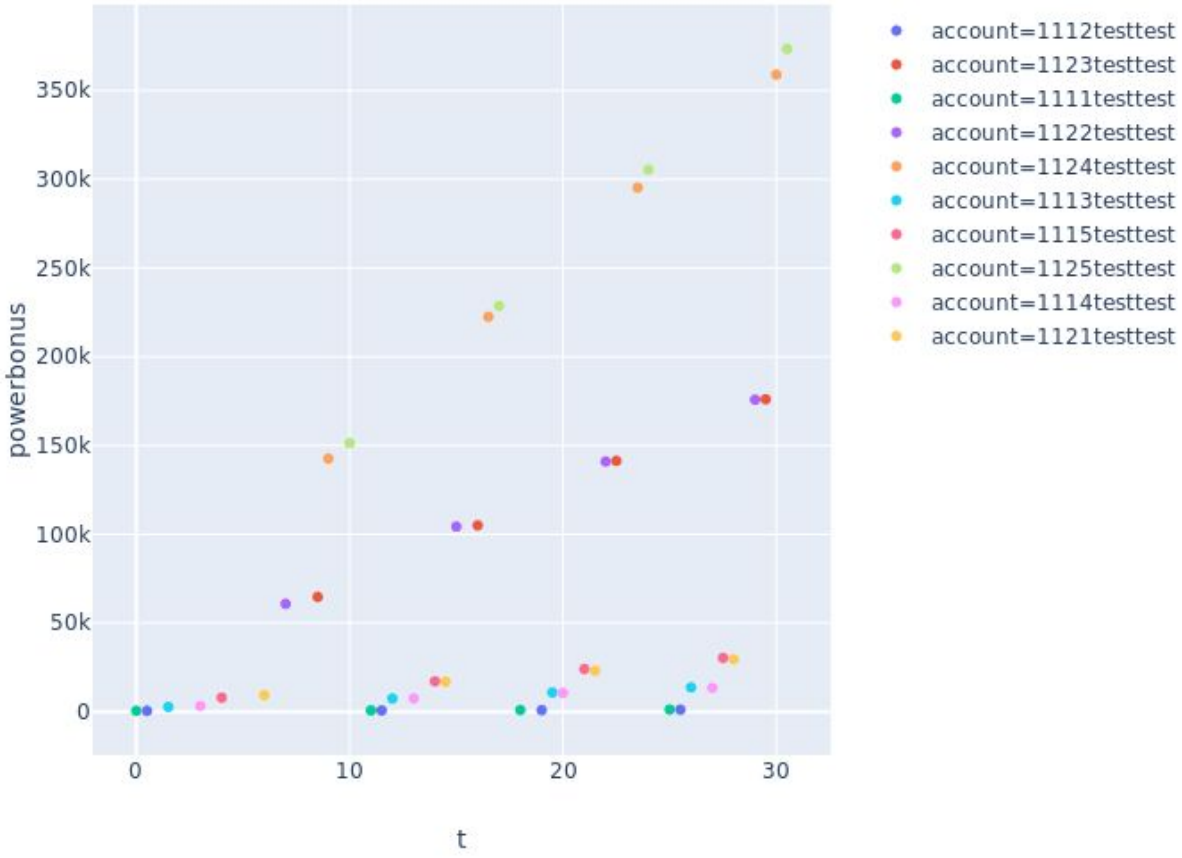
stakeDifficulty	poweredStake Multiplier	powerDifficulty	powerBonusMax Rate	totalStaked	
11000000512	75	110000000	0.05000000075	0	
account	t	totalstake	stakebonus	powerbonus	boidpower
1111testtest	1569895009	100000	169.9286	453.143	961.5302734

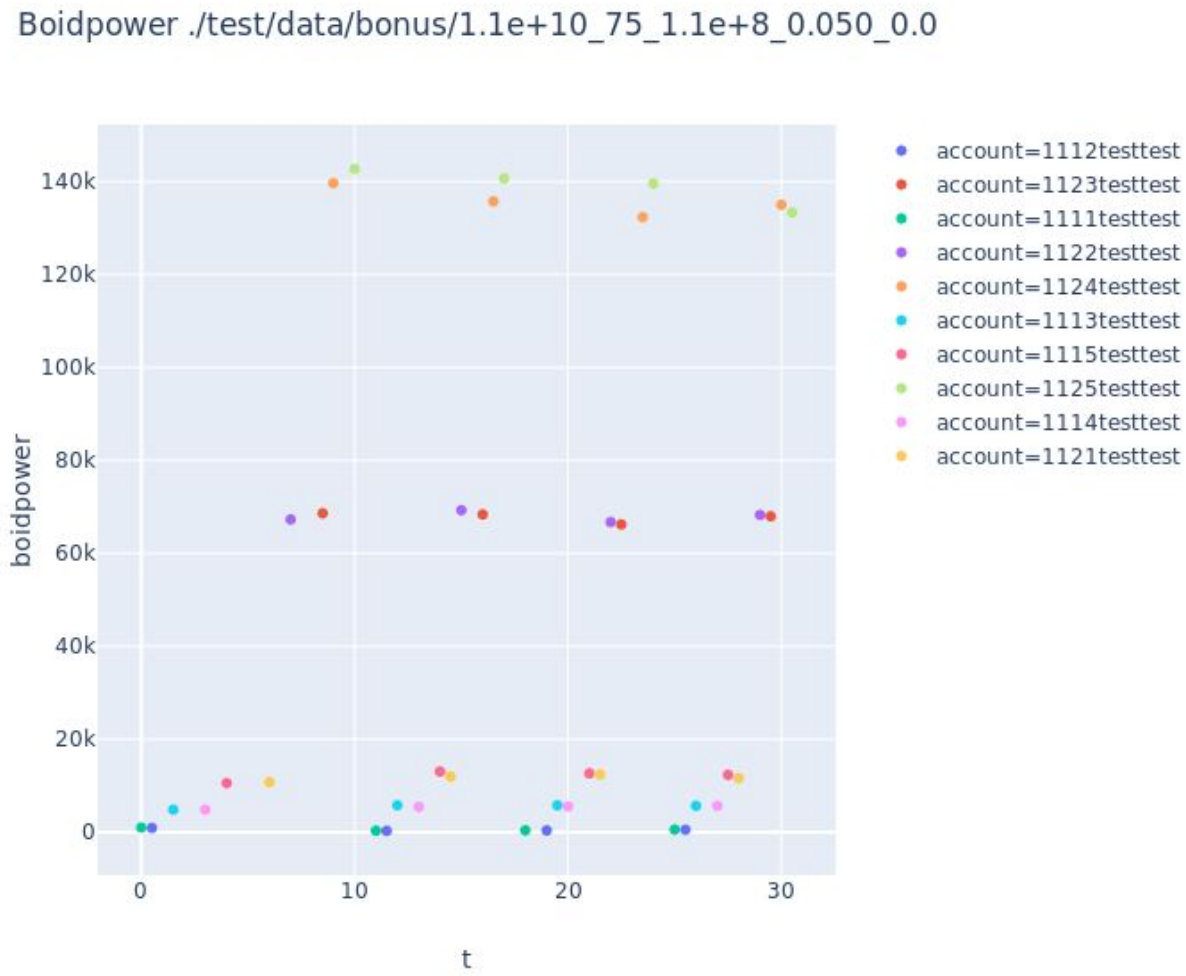
1111testtest	1569895020	100000	355.1453	700.0986	285.8283081
1111testtest	1569895027	100000	511.6897	908.8245	354.3187866
1111testtest	1569895034	100000	710.0825	1173.3482	518.1199341

stakeDifficulty	poweredStake Multiplier	powerDifficulty	powerBonusMax Rate	totalStaked	
11000000512	75	110000000	0.05000000075	0	
account	t	totalstake	stakebonus	powerbonus	boidpower
1123testtest	1569895018	10000000	40416.6882	64666.7008	68608.57031
1123testtest	1569895025	10000000	70617.1948	104934.048	68355.0625
1123testtest	1569895032	10000000	97920.9289	141339.024	66212.75781
1123testtest	1569895039	10000000	123945.8118	176038.8704	67966.21875


Stake bonus ./test/data/bonus/1.1e+10_75_1.1e+8_0.050_0.0
stakebonus
250k
200k
150k
100k
50k
0
0
10
20
30
t
account=1112testtest
account=1123testtest
account=1111testtest
account=1122testtest
account=1124testtest
account=1113testtest
account=1115testtest
account=1125testtest
account=1114testtest
account=1121testtest

Power bonus ./test/data/bonus/1.1e+10_75_1.1e+8_0.050_0.0




Boidpower ./test/data/bonus/1.1e+10_75_1.1e+8_0.050_0.0
boidpower
140k
120k
100k
80k
60k
40k
20k
0
0
10
20
30
t
account=1112testtest
account=1123testtest
account=1111testtest
account=1122testtest
account=1124testtest
account=1113testtest
account=1115testtest
account=1125testtest
account=1114testtest
account=1121testtest