Pegnet Limited PEG Conversions
Per Block PEG Conversions
November 25, 2019

1 Calculating Conversions Payouts

All math below should be done in fixed decimal point space with 8 decimal places. For demonstration purposes, this document will assume 0 decimal points, and use integer operations.

1.1 Obtain the Conversion Set

n is the set of all conversions in a block where the conversion is valid (enough balances for the input amount), and the output is PEG.

$$\{n \in BlockConversions \mid ValidPegConversion(n)\}$$

1.2 Calculate Total

All conversion input amounts will be calculated in PEG for a common basis of comparison. The expression of the input amount into PEG is the standard conversion equation used in Pegnet, and not shown here.

T is the sum of all input conversion amounts, denoted in PEG. $input()$ is a function that calculates this PEG input amount.

$$T = \sum_{c \in n} input(n)$$

1.2.1 If Total < 5000

If the total is less than 5000, allow all conversion requests at their requested amounts. There is no need to do the proportion calculations, as every conversion can be fulfilled in full.

The payment amount for an input c is:

$$p(c) = input(c)$$

1.3 Calculate Payouts

Each conversion request will receive a PEG payout amount. This amount is not necessarily their requested amount. The amount that is fulfilled will be in proportion to their requested amount over the total.

To calculate the payout for a single conversion request (remember that all math is done in integer operations, so we cannot use fractions), where p is the payout amount in PEG, and c is a single conversion request.

$$p(c) = \frac{input(c) * 5000}{T}$$

What the payout equation is doing, is finding the proportion of the total a single request is, and paying out that proportion of the 5,000 allowed PEG. So the set of all payouts, P, is:

$$P = \{p(c) \mid c \in n\}$$

The sum of all payouts in P should be very close to 5,000. However due to precision loss in the fixed decimal points, there will be a remaining small amount of dust. In order to keep the total PEG converted a nice flat 5,000, the dust will be added to the highest requested amount. And in the case of a tie, the amount will go to conversion with the lowest entry hash. If there is 2 conversions in the same entryhash, it goes to the lowest tx index.

1.4 Remainders

Because each conversion request is only partially filled, the remaining amount is returned back in the original asset. For a single conversion request, the return amount is denoted in PEG in the equation, but is converted back into the original asset.

$$return(c) = input(c) - p(c)$$