Title: Blockchain Oracle with new reputation system

Author: Peter Park

Simple Summary

The key feature of this system is the new reputation system. Reputation can be based on a variety of metrics, such as uptime, response time, and successful jobs completed. This reputation system not only gives developers reliable metrics when choosing oracles but also it holds nodes accountable for their services.

Current State of Oracles

An oracle is a blockchain middleware that creates a secure connection between smart contracts and various off-chain resources that they need to function. It acts as the middle layer between a blockchain and an API that translates information for the blockchain to read. An API is a defined way to communicate with a particular system and varies in design from system to system. Companies develop their own APIs to enable other systems to leverage their services and data in their applications. For example, Uber uses a GPS API, an SMS API, and a Payments API for its services rather than building each of those applications itself.

There are three oracle models: oracles coded from scratch by and for a particular entity, centralized oracles, and decentralized oracles.

Abstract

When choosing oracles, it will select oracles randomly based on a certain reputation threshold. And the reputation score of every oracle is hardly increased and easily decreased.

Motivation

Blockchain is supposed to be decentralized and robust. The future of the blockchain is fully decentralization not, semi-centralization or centralization. And it must be a useful and reliable service that will not be compromised by leaking sensitive information, getting hacked, experiencing downed servers, etc.

Technical specification

Every oracle has its own reputation score. The core of this system is selection of voting oracles. Voting oracles are selected according to their reputations. When the oracle's voting is verified as true, its score is increased based on its current score. If the sum of upvoting weights is over 70% of the total weight, it

is verified as true. The reputation score doesn't only affect the selection ration of voting oracle, but also affects the voting weight.

In the following case, oracle's level can be easily upgraded from Level 5 to Level 4. But it is very difficult to be upgraded from Level 2 to Level 1.

We define 5 Levels for use levels and set 10.0 as the max reputation score. ([1])

Reputation score line is divided into 5 levels according to [2].

The additional score point (δ) is the point which is added to the score when the oracle did the true voting. δ decreases as the score increases.

When the oracle did the false voting, its reputation score is set to the low score point of under level.

Level	Reputation Score
5(New oracle)	1.0<=x<5.09
4	5.09<=x<7.7
3	7.7<=x<9.18
2	9.18<=x<9.83
1	9.83<=x<=10.0

$$\beta \sum_{i=1}^{i \le MaxLevel} \left(\frac{i}{2}\right)^2 = Score_{max} - Score_{min},\ Score_{max} = 10.0,\quad Score_{min} = 1.0 \qquad [1]$$

$$Low_{level} = Score_{max} - \beta \sum_{i=1}^{i \le level} (\frac{i}{2})^2\ ,\ \delta = 0.01 \qquad [2]$$