

Smart Contract for Farm Commodity Supply Chain Logistics

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Executive Summary

This document describes provides an overview of an Blockchain Technology based cross border Farm Commodity Trading solution.

Introduction

Parties Involved (Actors)

The Actors or the Transacting Entities are:

- Seller
- Buyer
- Smart Contract DAPP (Distributed Application)
- Insurance Service Provider
- Logistics Service Provider

Seller

The seller could be a farmer, farmers' co-operative or a consolidator like a cold storage owner.

Buyer

Buyer could be any entity.

Distributed Application (DAPP)

An Ethereum Distributed Application (DAPP) that provides the following services:

- Matching & Bidding
- Escrow Service
- Transactional Transparency
- Regulatory Compliances
- Arbitration

For the purpose of this document the DAPP will be henceforth be referred as **Farm Trade DAPP**.

The Insurance and Logistics providers can either directly interact with the Smart Contract or can integrate their backend service through an API provided by the DAPP.

Insurance Service Provider

The Insurance Service Provider provides the insurance and has a trust and integration relationship with the Logistics provider. For example AXA.

Logistics Service Provider

The Logistics Service Provider is the logistics company like DHL or FedEx.

Transaction Sequence Flow

The following are Sequence Flow of a transaction:

1. Farm Trade DAPP publishes a standardized contract with configurable parameters.
2. The Buyer can publish a RFQ (Request for Quote)
3. Seller can publish an Offer or responds to a RFQ, which is a derived Offer.
4. Negotiation can take place both online or offline. Online negotiations are chat streams that are recorded for future reference by the transacting parties or by an arbitrator in case of a dispute.
5. Once settled the Buyer transfers the transacting Fiat Currency through a Smart Contract to Escrow Account. A Smart Contract Account is created by the Escrow Service. We will call this Multi Party Transaction Escrow Smart Contract (MPTESC) Account.
6. This MPTESC Account is also a Smart Contract and is watched by all the transacting parties.
7. Once the MPTESC Account is funded by the Buyer, the Seller is notified and she ships the consignment through the Logistics Service Provider.

8. The Logistics Service Provider then updates the MPDESC state and all parties get notified. If this state transition does not occur within a pre-specified time frame. The Transaction is deemed cancelled and money is reverted from the MPDESC Account back to the Buyer. If the Incoterms is either EXW (Ex Works) or FCA (Free Carrier) then the Seller receives the money from the MPDESC Account.
9. On Delivery, the Logistics Service Provider updates the MPDESC. In case of Incoterms is either of CFR (Cost and Freight), CIF (Cost Insurance and Freight), CPT (Carriage Paid To), CIP (Carriage and Insurance Paid to), DAT (Delivered at Terminal) or DAP (Delivered at Place) the MPDESC sends money to the Seller.
10. In case of an unlikely event of an mishap on the way, the Logistic Service Provider updates the MPDESC state. The Insurance claim is initiated and money is reverted back to the buyer.
11. Finally, in case of Incoterms being DDP (Delivered Duty Paid) the Seller receives the payment when the Buyer and Logistics Provider both acknowledge the receipt of consignment.

Currency Exchange Risk Mitigation

Cross border transactions involve currency fluctuation risks. Specially, for a Ethereum Smart Contract on public network, if the base currency is ETH or ETC cryptocurrency, then the risk is much higher.

Thus once the transacting parties agree upon a Fiat Currency, the buyer should escrow the funds in the transacting currency. The Escrow Service Provider then should protect itself against the exchange rate volatility. This become more important for cryptocurrencies, as they have a very high volatility index.

Regulatory Compliances

The following needs to be complied:

- Currency Exchange Regulation
- AML (Anti Money Laundering)
- Export Regulation
- Import Regulation
- International Shipping and Transportation

