SCHAIN Draft Protocol
https://github.com/QuantumProductions/SCHAIN
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The SCHAIN protocol describes a supply chain network enabling full transparency in chain of custody during freight shipment, funds for the supplier and courier escrowed and delivered through a smart contract and the possibility of complete automation for the purchase, transport and delivery of goods.
Features of the SCHAIN:
* Trustable: Records of cryptographic signatures for each step in the Supply Chain process to minimise Fraud.
* Automatable: Using an electronic system allows for automating technologies to integrate with SCHAIN. eg. robot cars, pallet unloaders, inventory management systems.
* Consistent: By agreeing on a consistent protocol, hardware & software can be developed across industries without having to reinvent the wheel for each reseller or industry.
* Efficient: Data for all transactions is recorded in the SCHAIN network. Individual companies can process this data to increase throughput and economic efficiency.
A transaction in SCHAIN involves 5 roles that perform their part across a defined sequence of 6 steps.
The 5 roles are Needer, Supplier, Accessor, Courier, Handler.
Step 1: The Needer posts a buy order to the SCHAIN network.
Step 2: A Supplier volunteers to fill the order.
Step 3: The Needer approves the Supplier's bid.
Step 4: The Accessor defined in the Supplier's bid collects the good from the Supplier's warehouse and makes available for the Courier.
Step 5: The Courier takes the good from the Accessor and delivers to the Handler.
Step 6: The Handler receives the good from the Courier, completing the transaction.
Funds are escrowed at Step 3 through the SCHAIN smart contract. When the Courier collects the good from the Accessor, they receive a partial payment as does the Supplier according to the specification in the Needer's ask. When the Courier delivers the good and the Handler acknowledges receipt, the Courier & Supplier receive the remainder of their escrowed funds.
The responsibility for completing a transaction transfers custody at each step, triggered by a cryptographically signed message.
This gives the potential for each step in the transaction to be automated by machines.
--- Details:
(A "link" here refers to the cryptographic hashing & signing of all previous links for this transaction combined with the new link.)

1: THE NEED: A buyer posts a Need to their SCHAIN Network. The Need specifies:
  -- What kind of item and how they want it to be delivered.
  -- An escrowed transaction to the Supplier
  -- A Validation requirement for the conditions of that Escrow to be paid.
  -- Which entity will receive the items from the Courier (the Handler)

NOTE: The escrow payment COULD BE FROM A NEW ENTITY. The Needer could have contacted an independent party to pay for the item. For example, in a crowdfunded purchase of a new coffee grinder for a coffee shop, or an investor making a materials purchase for a new company.
THE MATCH: The Supplier of the posted Need accepts the Need. They post the next link in the sequence which cryptographically signs their identity and intention to match the Need. This link additionally specifies:
 -- Which entity will Access the Item from which location
 -- Which entity will Courier the Item
 -- An escrow payment to the Courier
 -- A Validation for the escrow to be paid when the Handler receives the delivered Item
THE APPROVAL: With the Match posted, the Needer has the opportunity to Approve or Reject the matched bid. They simply post an Approval link, specifying:
 -- The timestamp of Approval
 -- Confirming the Match with a signed hash of the Match
THE ACCESS: With the Need matched by the Supplier, an Accessor collects the Item from the Supplier and delivers to the Courier. This will likely be an agent of the Supplier onsite at their warehouse. This link will trigger the payment of an escrow from the Supplier to Accessor, if applicable. The Accessor's link specifies:
 -- Item accessed from the Supplier and now in Accessor's possession, including a tracking number or barcode for the Supplier and/or Needer to monitor.
THE DELIVERY: The Courier fills in the next link, broadcasting to the network:
 --A signature of the Access link indicating the item is received and they are en route to the Handler specified in the Need link.
 --Any optional notes the Courier wishes to publicise to indicate a damaged item, bad weather conditions, etc.
THE RECEIPT: As the Courier delivers the item to the Handler, the Handler announces receipt of delivery, specifying a timestamp of receipt. This triggers approval for the escrowed payment from the Needer to the Supplier to fulfil.
 --The item is delivered. The SCHAIN circuit is complete!
 -- Notes:

Authorization to sign a link could be proxied to another entity if specified in the contract. For example, a factory ordering steel could proxy the verification of delivery to A visual verification network + 1 of a list of approved Verifiers. A visual verification network would receive photos of the delivery + information about the steel order. That network could escrow a bounty to be paid out when enough of its members have voted (Verify or Reject) on if the photos match the order information.
This visual verification network could be staffed by third-party contractors with no affilitation to any of the companies involved in the transaction. In addition to this third-party audit completing, 1 of the approved Verifiers would also have to accept.
This provides additional mitigation against fraud by proving to all parties that the goods were delivered and accepted.