MARITIME ADMINISTRATION'S

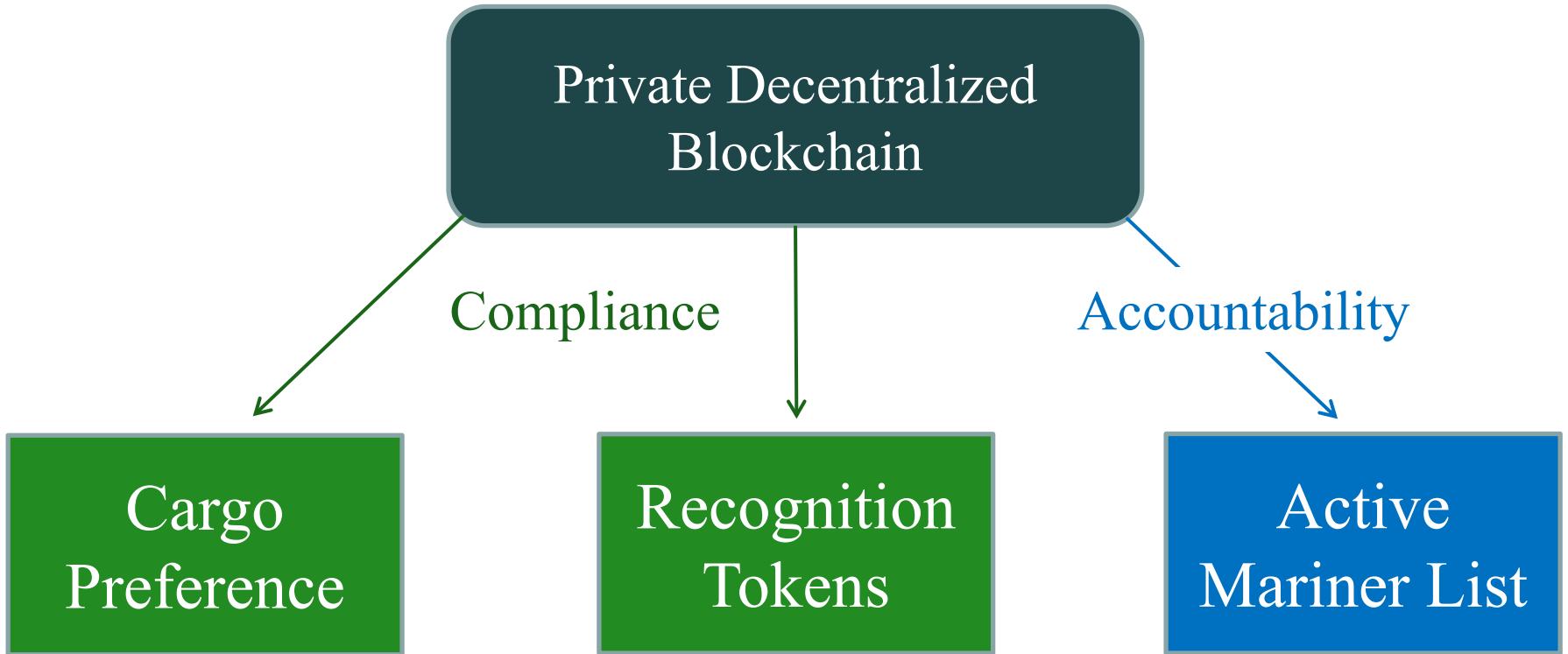## Cargo Preference Blockchain Compliance & Mariner Accountability Platform

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Current Impediments

➢ Fellow Federal Agencies are not all aware of Cargo Preference laws and the corresponding legislative mandates

➢ Communication and coordination amongst Federal agencies is limited, if not nonexistent, in most cases

➢ The current system is paper based and requires manual input of shipping data from pertinent documents (ie bills of lading) into multiple systems (ie Microsoft Access and Excel)

➢ We don't know what we don't know
  ➢ What are all the agencies involved in international maritime commerce?
  ➢ For those who are we are not aware of, are they aware of and following our cargo preference laws?
  ➢ How many mariners do we have currently licensed and actively sailing?

Solution

Private Decentralized Blockchain

Compliance

Accountability

Cargo Preference

Recognition Tokens

Active Mariner List

Architecture

*HyperLedger/TradeLens *SmartCard/Modified TWIC *IBM Cloud *Token (Recognition) *Shared Documents *APIs

Enters Blockchain/TradeLens/IBM Cloud

-Encryption; Tokens Created

| Federal Agencies & Military Branches | Carriers/ TradeLens Partners | Light Node *API | MARAD | *Full Node *API |

-Monitors Process
-Tracks Compliance
-Increases Compliance & Decreases Corruption
-Tracks Actively Sailing Mariners
-Mines Recognition Token Acquisition & Determines Designated Dissemination

Digital Bill of Lading Entered into TradeLens

Cargo

-Origin/Destination
-No Financial Data

Destination Port — Light Node *API

-Freighted Bill of Lading
-Mariner Crew Manifest

*Application Program Interface
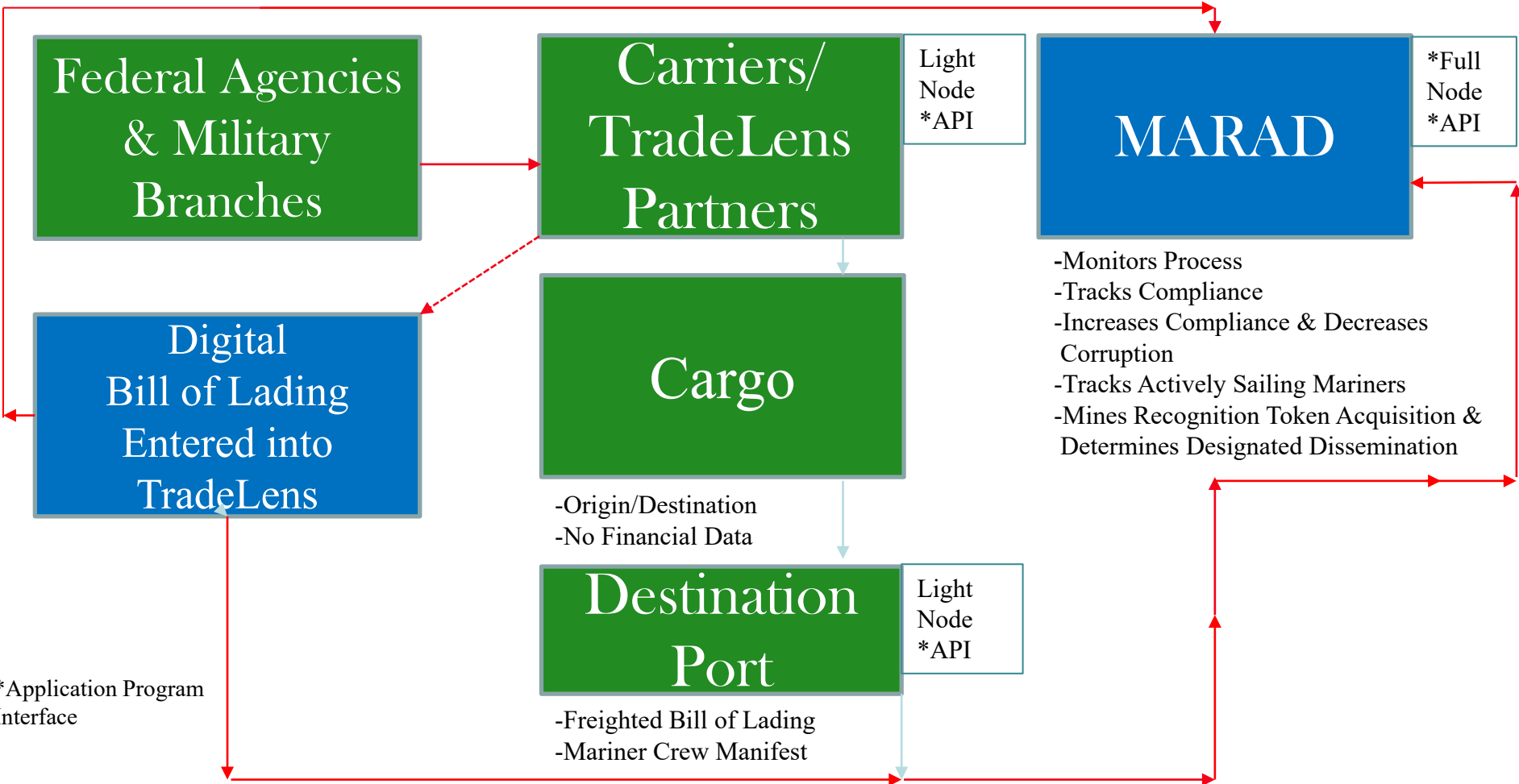
Underlying Technology

➢ TradeLens is an open and neutral industry platform

  ➢ Advances cross-industry blockchain technologies

  ➢ Enables the sharing of real-time, end-to-end supply chain information

  ➢ Transfer trade documents across organizations enabling automation

  ➢ Improve physical and financial asset management

  ➢ Uses open standards, open documentation, and interoperability delivered by the IBM Cloud

  ➢ Currently over 160 participants using platform as of October 24, 2018
    ➢ Includes small ocean carriers and NDAs signed with large ocean carriers

TradeLens

➢ TradeLens is comprised of three primary layers:

   ➢ Network
      ➢ Carriers, shippers, customs, possibly MARAD, etc who connect and provide data to the platform

   ➢ Platform
      ➢ The blockchain/hyperledger itself
         ➢ Datasets and documentation

   ➢ Application
      ➢ TradeLens and participants' own APIs and applications, and is built upon the blockchain in the form of Smart Contracts

   ➢ TradeLens is aware of other blockchain projects, like E-bills of lading projects, and welcome all to integrate with TradeLens

➢ IBM is improving TradeLens to interoperate with Enterprise Resource Planning

Private

- Private
  - Access to the MARAD/TradeLens Blockchain Platform will require a private key

  - Full Nodes
    - MARAD will serve as a Full Node
    - Have access to all data including bills of lading and other pertinent financial data
    - Will have a full visual of all government freight tenders and awards enhancing the government's ability to negotiate with US Flag carriers and do better logistical planning
    - As more carriers adopt blockchain technology, the growth of our visibility and awareness

  - Light Nodes
    - US Flag Carriers and Destination Ports will only have access to Origin/Destination, Vessel Name and IMO, Freight Type, Freight Weight, and Cubic Meters

Decentralized

➢ In a decentralized blockchain system, multiple devices store information and are interconnected.

➢ Storing data in this way provides tremendous cybersecurity benefits, since a single access point to the system does not exist.
 ➢ MARAD and the logistics offices of every government agency will serve as nodes
    ➢ The role of a node is to support the network by maintaining a copy of the everchanging blockchain in real time
   ➢ A node can either be a communication endpoint (MARAD) or a point of communication redistribution (Carriers and Ports) linking to other nodes.

➢ Every node on the network is considered equal, however certain nodes have different roles in the manner in which they support the network. For example, not all nodes will store a full copy of a bill of lading or validate transactions.
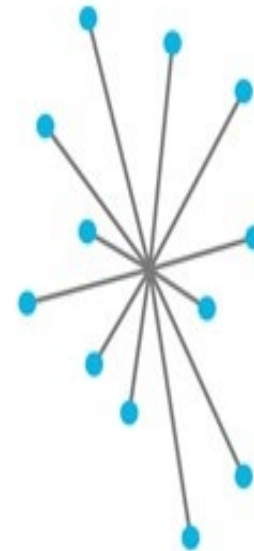
Centralized   Decentralized
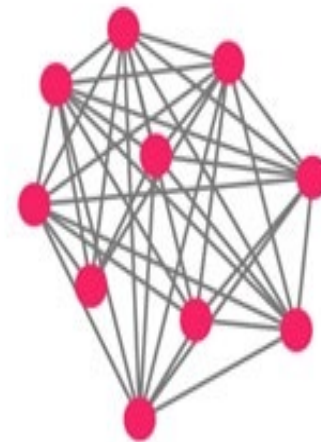
Active Mariner Database

➤ Freighted Bills of Lading and Official Crew Manifest will be sent electronically to MARAD via MARAD/TradeLens Blockchain

➤ There is currently no resource that provides a real time accurate account of active mariners currently manning US Flag Vessels
  ➤ No accurate account of mariner availability for war time necessities
  ➤ Coast Guard only keeps track of those who acquire or update their license
  ➤ Skews mariner pool assessment negating proper war time planning or peace time awareness

Proof of Stake Token Mining

➢ Proof of Stake was first suggested on the bitcointalk forum back in 2011, but the first digital currency to use this method was Peercoin in 2012, together with ShadowCash, Nxt, BlackCoin, NuShares/NuBits, Qora and Nav Coin.

➢ MARAD will mine tokens just by having computers running with limited computer power needed

➢ Provides increased protection from a malicious attack on the network.
   ➢ Executing an attack would be much more expensive requiring the attacker to own the majority of all tokens created, meaning the attacker suffers severely from his/her own attack

Recognition Tokens

➢ Unlike traditional coin offerings with a monetary value tied to it, coins mined within MARAD's Blockchain System value would be in the area of Recognition

➢ All coins mined by MARAD will be stored with and allocated by MARAD

➢ Coin distribution coinciding with corresponding legislative mandates will be as follows:

  ➢ Civilian Agency Cargo and Food Aid
    ➢ For every .1% over the 50% compliance, one (1) Recognition Token will be awarded

  ➢ Military and Ex-Im Bank
    ➢ For every .1% over 90% compliance, one (1) Recognition Token will be awarded

Recognition Tokens (cont.)

➤ Token accumulation will be tracked perpetually from the start of the program to infinity and beyond

➤ Provides a fun, innovative, real time account of where each agency is in cargo preference compliance

➤ Although total token accumulation will be tracked throughout the life of the program, a new yearly tally will start at the beginning of each new fiscal year

➤ On top of a real time Token counter being showcased on the Cargo Preference webpage, yearly award ceremonies could be held to award the Agency, and arm of the military, who sourced US Flag the most above their minimum mandates

➤ US Flag Carrier Token accumulation numbers will be used to create an equitable pecking order of US flag service, enabling tiered carrier preference based on performance and not favoritism in the least

Summarized Benefits of Adoption

➢ A fun and innovative education and outreach campaign tool to inform fellow government agencies about cargo preference laws, while also providing a mechanism to make compliance seamless

➢ A real time account of cargo preference compliance standings enabling meaningful useable data analytics

➢ A real time account of actively sailing mariners, Strategic Sealift Officers, and all mariners within the Coast Guard Merchant Mariner Credential List

➢ Through the universality of technology, seamlessly form and nurture relationships, and their corresponding open channels of communication, amongst fellow government agencies

➢ Automate data accumulation and management freeing man power to do industry, agency and congressional outreach and education

Cargo Preference

➢ *1904 Act requires 100% compliance for military cargoes*

➢ *1954 Act requires 50% compliance for civilian cargoes*

➢ *Public Resolution 17 (1934) requires 100% compliance under certain EXIM Bank transactions:*
  ~ Direct loans regardless of term or amount and
  ~ Guarantees valued over $20,000,000 or with repayment
    terms greater than seven (7) years

Total estimated cost to the US taxpayer of ~$300M

US vs Flag of Convenience Daily Ship Operating Costs

2016 Operating Cost Structures