



*"Send forth its cheering ray  
to the storm beaten  
mariner..."*

– Federal Officer, Aug. 1861

ADMIT ONE



Ticket Number 0974572

The giant oak is an acorn that held its ground.  
[www.greatdreams.com/72.htm](http://www.greatdreams.com/72.htm)



"The secret of change is to focus all of your energy, not on fighting the old, but on building the new." Dan Millman Way of the Peaceful Warrior

FEDERATION: Latin: *foedus, foederis, 1. covenant, union of partially self-governing states under a central government 2. League or confederacy. People, groups retain autonomy 3. A federated body formed by a number of nations, states, societies, unions retaining control of own internal affairs*



SAW Concepts LLC  
PO Box 28 Oceanport, NJ 07757  
Cell: 732-768-5440  
<http://sawconcepts.com/index.html>



UNUSED  
RESOURCES

vector  
</UNMET>  
("NEEDS")

Annex  
Signals  
Telemetry  
r. buckminster fuller  
operating manual  
for  
spaceship earth

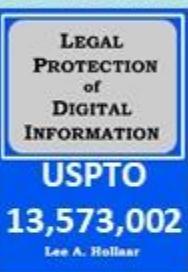
## PROCEDURAL TEMPLATE

COMMON  
BUILDING  
BLOCKS



**Systemic series of actions directed to a goal ex: form, maintain sustainable Eco / Econ federations i.e., closer = less fuel, \$**

Checklist Items refer to detailed treatises



**A continuous action, operation, or series of changes, sync deltas i.e., price indexes**



**Sync trade federations across time-space**

**MINIMUM LIST OF COMPONENTS / BUILDING BLOCKS, PROCESSES, PROCEDURES AGREED UPON BY TRADE FEDERATIONS TO ACHIEVE CONSENSUS WITHIN DAO DISTRIBUTED AUTONOMOUS ORGANIZATIONS**

DAO's in FEDERATIONS AGREE TO USE COMMON COMPONENTS, SHARED PROCESSES, METHODS, SIGNALING - TELEMETRY SCHEDULE & METRICS IN SMART CONTRACTS, SERVICE LEVEL AGREEMENTS

CHECKLIST: TRADE FEDERATION ECONOMIC FRAMEWORK EX:

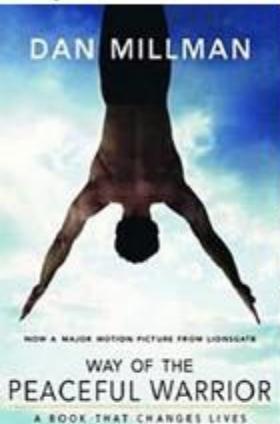
- 1) Organize by assigning Organization Identifiers {"Org\_ID"}
- 2) Track Resources by Uniform Resource Name </URN>
- 3) Take State Meta Data heartbeat snapshots @ 15 / N min
- 4) Honor Satoshi's intent for Bitcoin to be paired w markets
- 5) Use NIST Quantum Random Non-Repudiation Beacon
- 6) Use Bitcoin Blockchain "World Computer" / Neural Net





# Humanitarian Assistance Networked Donor System

H.A.N.D.S: "Based on the need to speed up the processes of influencing an adversary, new concepts result in the adaptation of military doctrine, organization, training, material, infrastructure, interagency interaction, leadership, personnel and facilities" ... German Bundeswehr : concepts of "Network Centric Warfare" in the United States of America, "Network Enabled Capabilities" in Great Britain or "Vernetzte Operationsführung" in Germany



"Shared situational awareness enables collaboration and self-synchronization, and enhances sustainability, speed of command"



"The secret of change is to focus all of your energy, not on fighting the old, but on building the new." Dan Millman  
Way of the Peaceful Warrior A Book That Changes Lives  
[http://en.wikipedia.org/wiki/Way\\_of\\_the\\_Peaceful\\_Warrior](http://en.wikipedia.org/wiki/Way_of_the_Peaceful_Warrior)

Derive best practice procedural template guides from Battlefield Digitization describing when, where, how, how often systemically among a systems of systems promoting synergy, synchronicity.

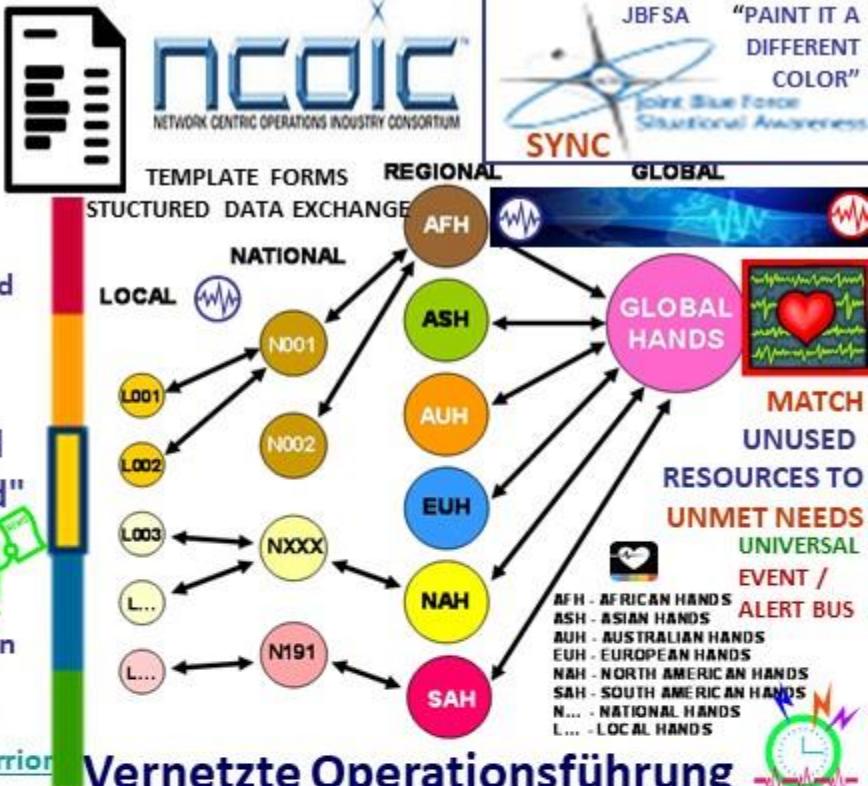


Heart Beacon Sculpture

Oregon  
USA

The sculpture, similar to a lighthouse, is an interactive enclosure of light, color, and sound acting as a symbol of hope and resilience for the community. Pulses create a thumping sound that resonates through the steel frame and flickers the lighting matching the pattern to their heartbeat. By measuring a small, internal element such as a heartbeat and amplifying it to a monumental scale the piece becomes a powerful reflection of individual life and reminder of what is worth saving.

[LINK](#)



## Vernetzte Operationsführung

REUSE OF A PENTAGON ACAT-1A SITUATION

AWARENESS PROGRAMS WORDS TO PLOWSHARES

PROPOSED BY GERMAN MILITARY CIRCA 2003

## FEDERATION



## Beacon Communities

Explore recent program news

Learn more >



OFF SHORE  
OUTER  
BANKS

JAEGER

KAIJU

JBFSA "PAINT IT A DIFFERENT COLOR"



# INTERNET FORMED BY:

- 1) Time Cycles / Epochs
- 2 {"SYNTAX"}</SYNTAX>

"In the beginning"

"The Word"

All things internet are formed with CPU time cycles used to process, parse, syntax, instruction code

"A blockchain is a consensus-based system. It only works if all nodes reach an identical state"

"A smart contract is a piece of code stored on a blockchain, triggered by blockchain transaction reads / writes data in the blockchain's Dbase"

Gideon Greenspan Beware the impossible smart contract



"Blockchain consortiums are working less on distributed ledgers and more on Contract Description Languages CDL., DAML Digital Asset Modeling Language"

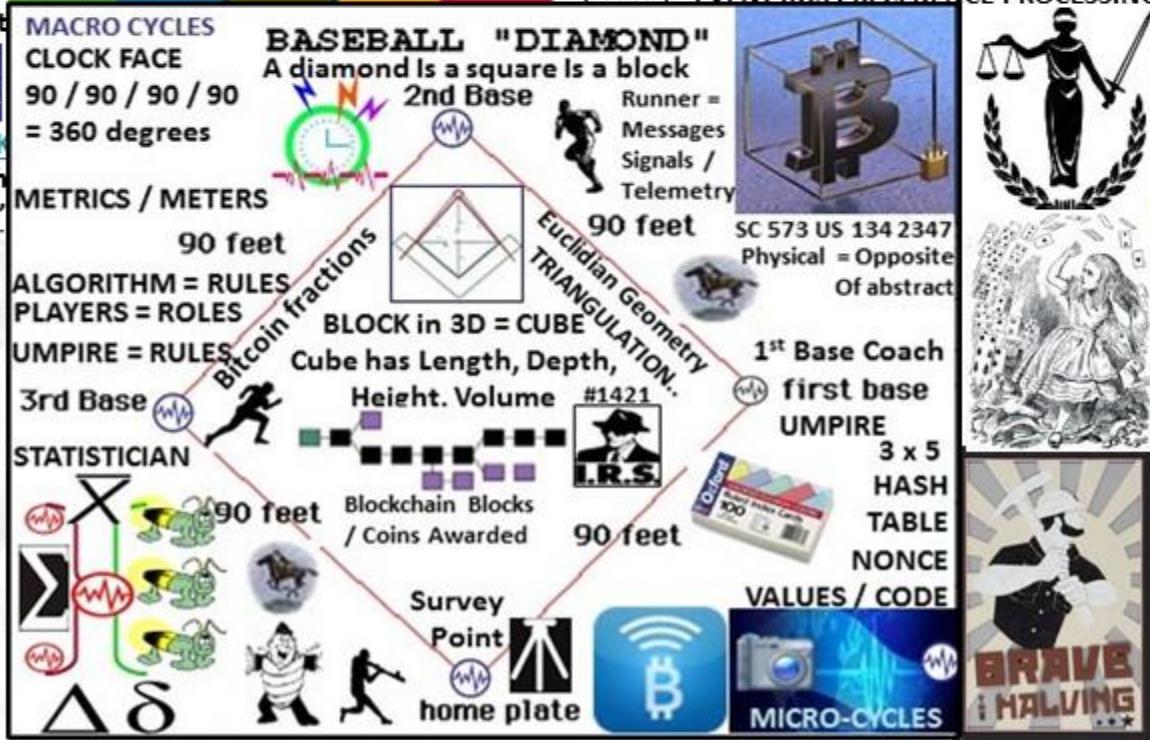
XBRL / CDL / DAML	
STOCK MIC CODES	
STRUCTURED	
MILITARY MESSAGE TEMPLATE FORMS	
LOGIC / FILTERS	
BREVITY CODES	
{URN}{URN}{URN}	
SYNTAX / SYMBOL LEXICON LIBRARY	



BITCOIN BLOCKCHAIN BLOCKS, AGENTS, MOTES, BOTS, PACKETS, FRAMES, HEARTBEAT, PINGS, HOPS, BEACONS = METAPHORS / MEMES

SC 573 US 134 2347

EU: "FEW UNDERSTAND" Impossible to Regulate PHYSICAL = OPPOSITE OF ABSTRACT DAO



FUTURE MEMES DOT COM



# Firefly - Heartbeat Algo

University of Bologna Italy / Hungary



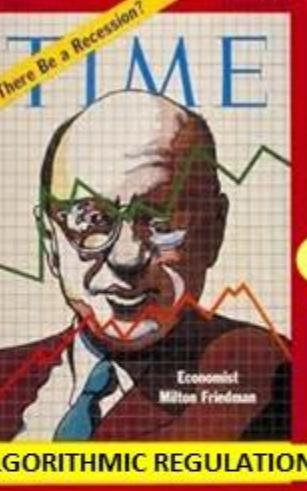
TERRACYCLE



LENGTH OF REAL TIME CYCLE IS ARBITRARY AS LONG AS NODES EVENTUALLY AGREE = HBC

Luxor Temple Egypt:

"The shortest road towards knowledge of truth is nature"



FRIEDMAN'S K % RULE  
ECONOMIC MACRO CYCLES

CONTRIBUTIONS TO STATISTICS

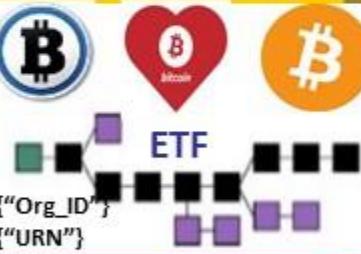
STAT MEAN VALUE INDEX



Price Indexes in Time and Space

Methods and Practices

FRIEDMAN's K% RULE

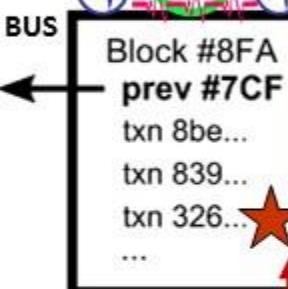
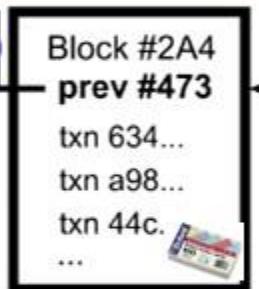
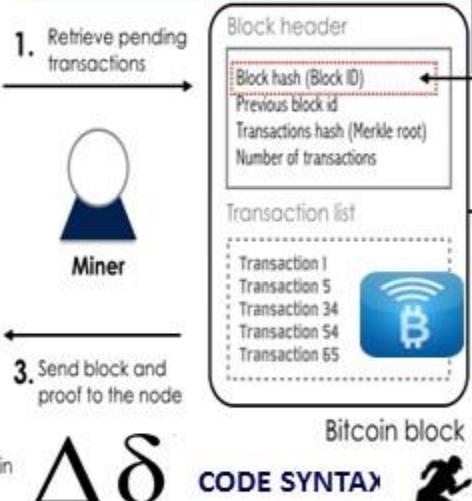
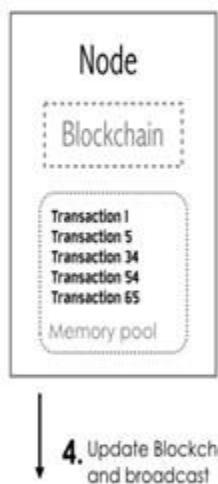


"Heartbeat Synchronization nodes in a distributed system generate periodic local heartbeat events approximately at the same time. It differs from classical clock sync in that nodes are not interested in counting cycles and agreeing on the ID of the current clock cycle. No rule governs the length of a cycle with respect to real time as long as the length is bounded and all nodes agree on it eventually"

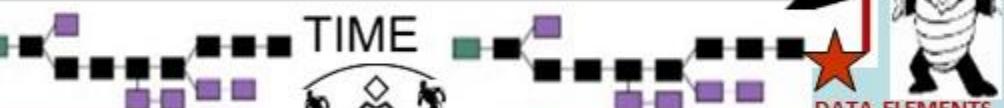




Alice Corp. v. CLS Bank International, 573 U.S. \_\_, 134 S. Ct. 2347 (2014),[1] was a 2014 decision of the United States Supreme Court about patentable subject matter (patent eligibility).[2] The issue in the case was whether certain claims about a computer-implemented, electronic escrow service for facilitating financial transactions covered abstract ideas ineligible for patent protection. The patents were held to be invalid because the claims were drawn to an abstract idea, and implementing those claims on a computer was not enough to transform that idea into patentable subject matter.



**BLOCKCHAIN = TIME / SYNTAX**



**DATA ELEMENTS**

ID'd by Alpha-Numerics

**BITCOIN IS A LANGUAGE / BITCOIN'S VALUE IS TIME ITSELF"**



TIME EPOCHS  
ASIC CHIP CLOCK CYCLES

← cycle n → ← n + 1 → ← n + 2 →



$\Delta\delta$

TIME  
EPOCH  
CYCLES

ATOMIC CLOCK

USPTO 13/573,002  
PHYSICAL MEME  
MAIN EMBODIMENT

RULES  
Metrics

$\Delta\delta$

Multi-Meme Multi-Meter



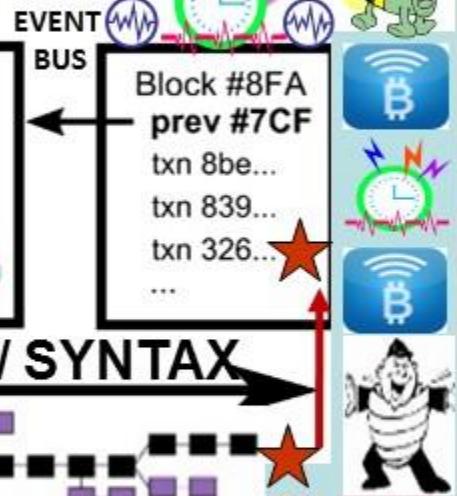
State Meta  
Data Snapshots

ROLES  
Meters

XBRL / CDL / DAML  
STOCK MIC CODES

STRUCTURED  
MILITARY MESSAGE  
TEMPLATE FORMS  
LOGIC / FILTERS

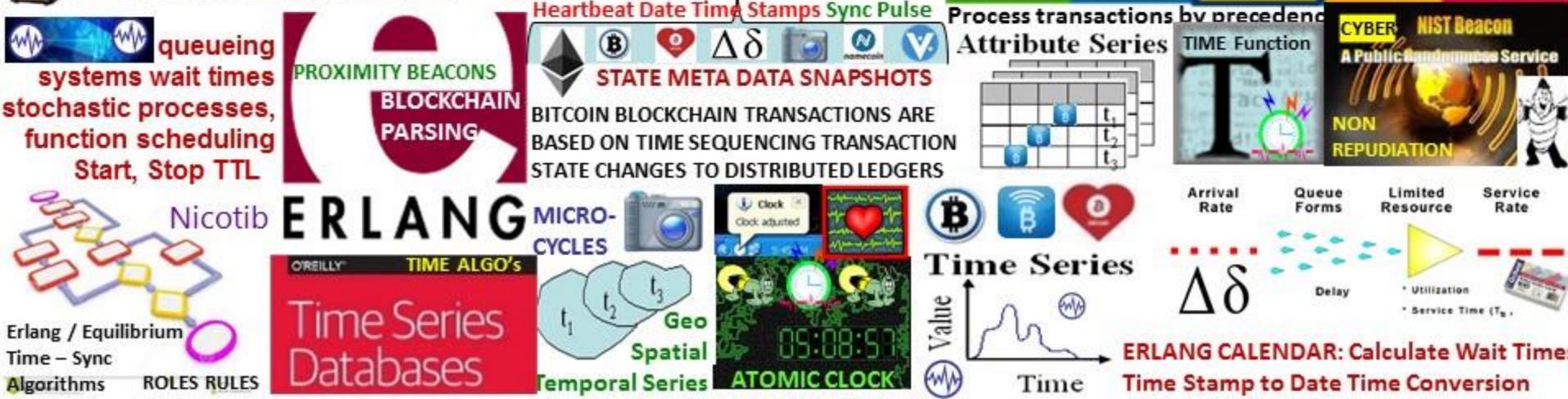
SYNTAX  
LEXICON LIBRARY



**DATA ELEMENTS**

ID'd by Alpha-Numerics

The current standard time common throughout the world is based on a 24-hour clock, with zones that are either 12 hours ahead or behind **Coordinated Universal Time (UTC)**. However, these time zones are decided upon by individual governments, without overall coordination and can even extend fourteen hours ahead UTC.

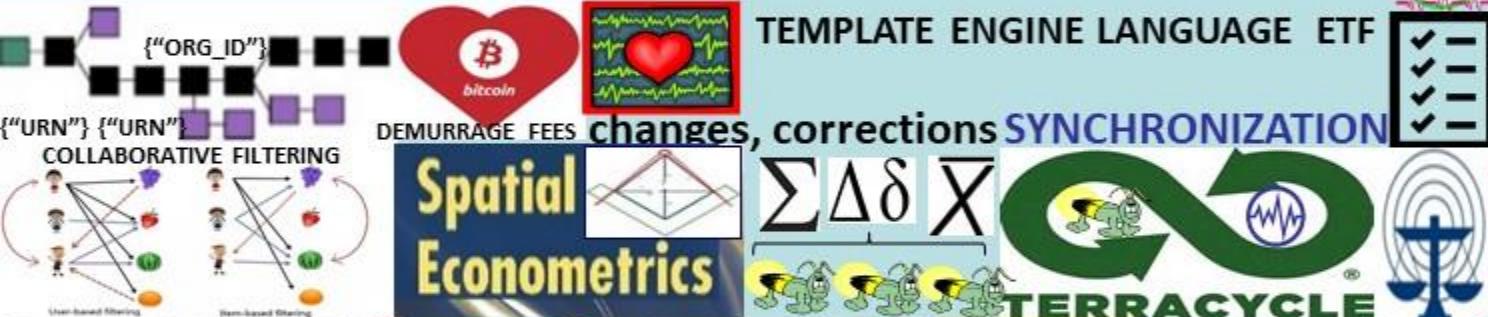




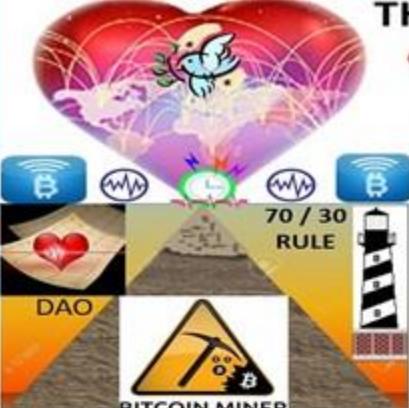
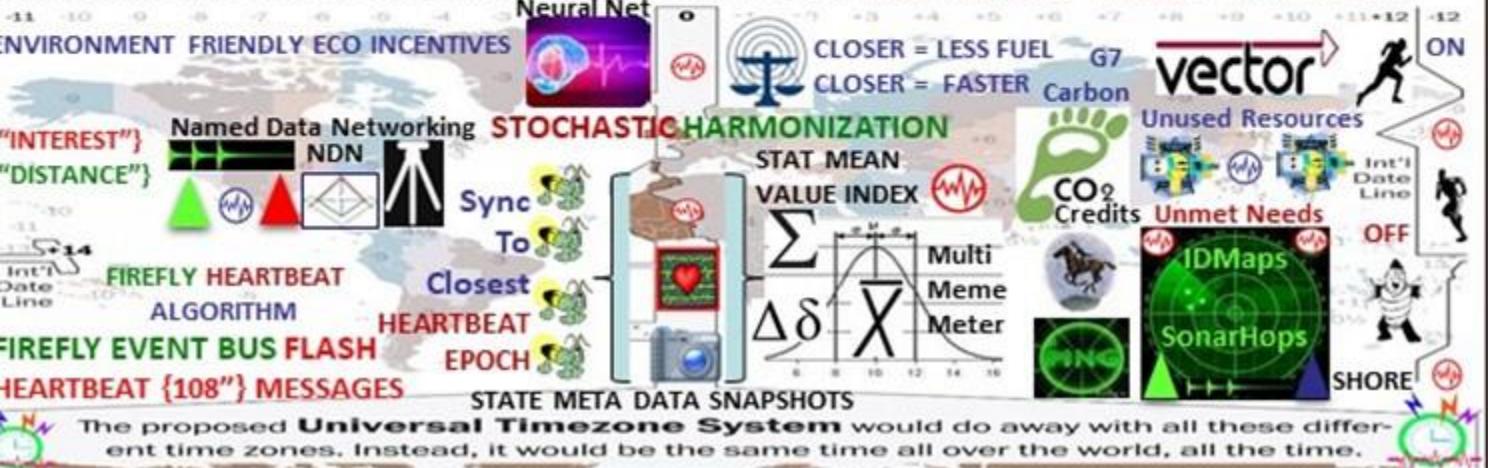
eGaaS: international blockchain platform for organizing economic, state, social activities of citizens, communities on the basis of smart law, smart contract system. eGaaS offers a comprehensive solution needed for state and business management on the blockchain platform.

The Heart Beacon Cycle HBC: an adaptive procedural checklist of form templates, procedures, SOP building blocks useful to form Eco-responsible trade federations Procedural template checklist items links to detailed technical, process... treatises

Distributed digital asset registries were the first projects that used blockchain systems such as databases designed for secure storage of records on real estate property, stocks, copyright and so on. It is assumed hosting any document on the blockchain is equivalent to notarization of its content at a fixed time point.



The current standard time common throughout the world is based on a 24-hour clock, with zones that are either 12 hours ahead or behind Coordinated Universal Time (UTC). However, these time zones are decided upon by individual governments, without overall coordination and can even extend fourteen hours ahead UTC. INCENTIVIZE ECO - FRIENDLY TRANSACTIONS

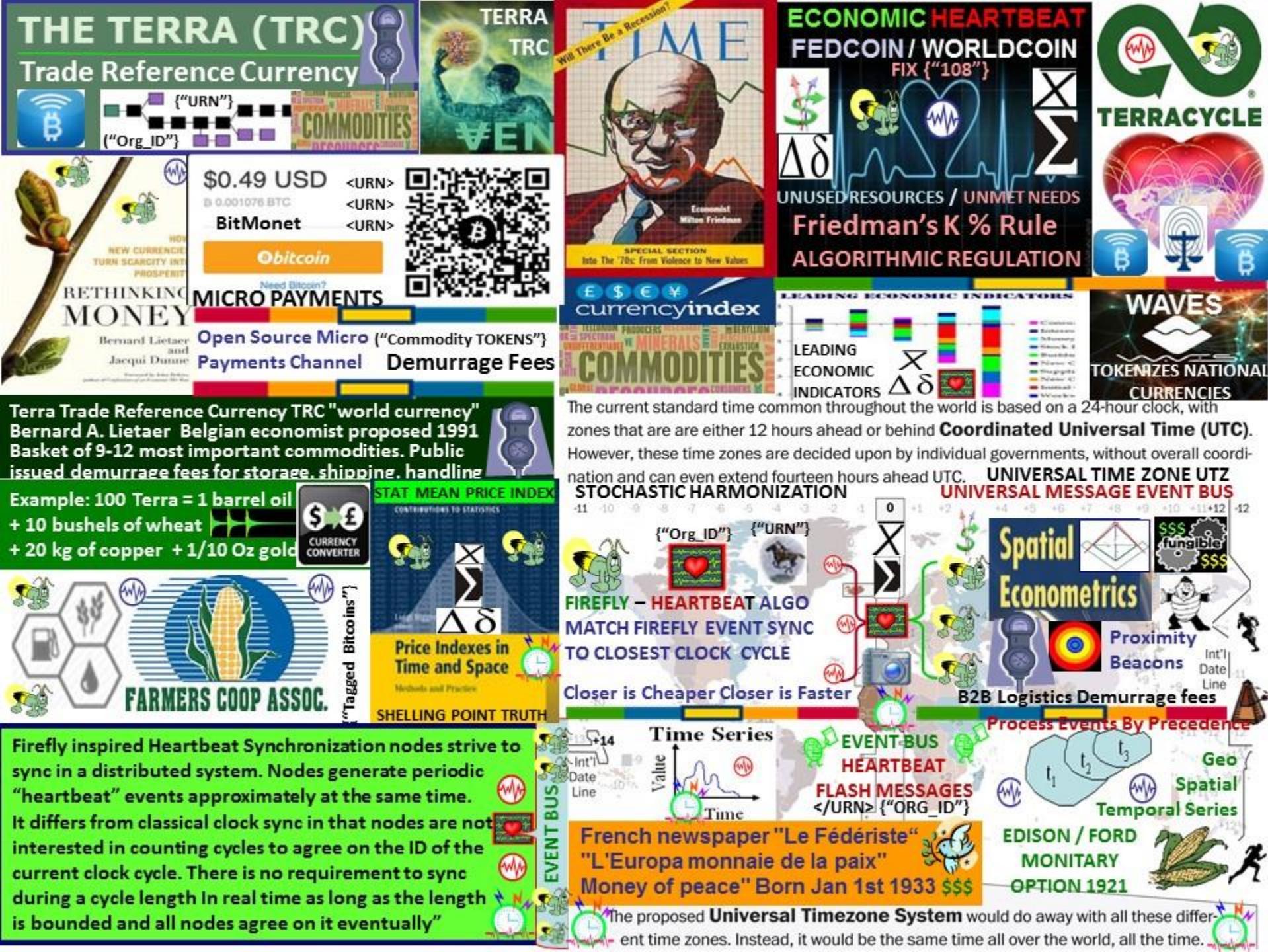


FROM	TO	TYPE	NAME	VERSION	SIZE	FORMAT	LAST UPD.
API	UI	SYNTAX / SYMBOL LEXICON LIBRARY					
API	UI	STRUCTURED DATA EXCHANGE					
API	UI	300 + TEMPLATE FORMS					
API	UI	LOGIC / FILTERS					
API	UI	ALPHA-NUMERIC BREVITY CODES					
API	UI	Time Series Databases					
API	UI	ERLANG					





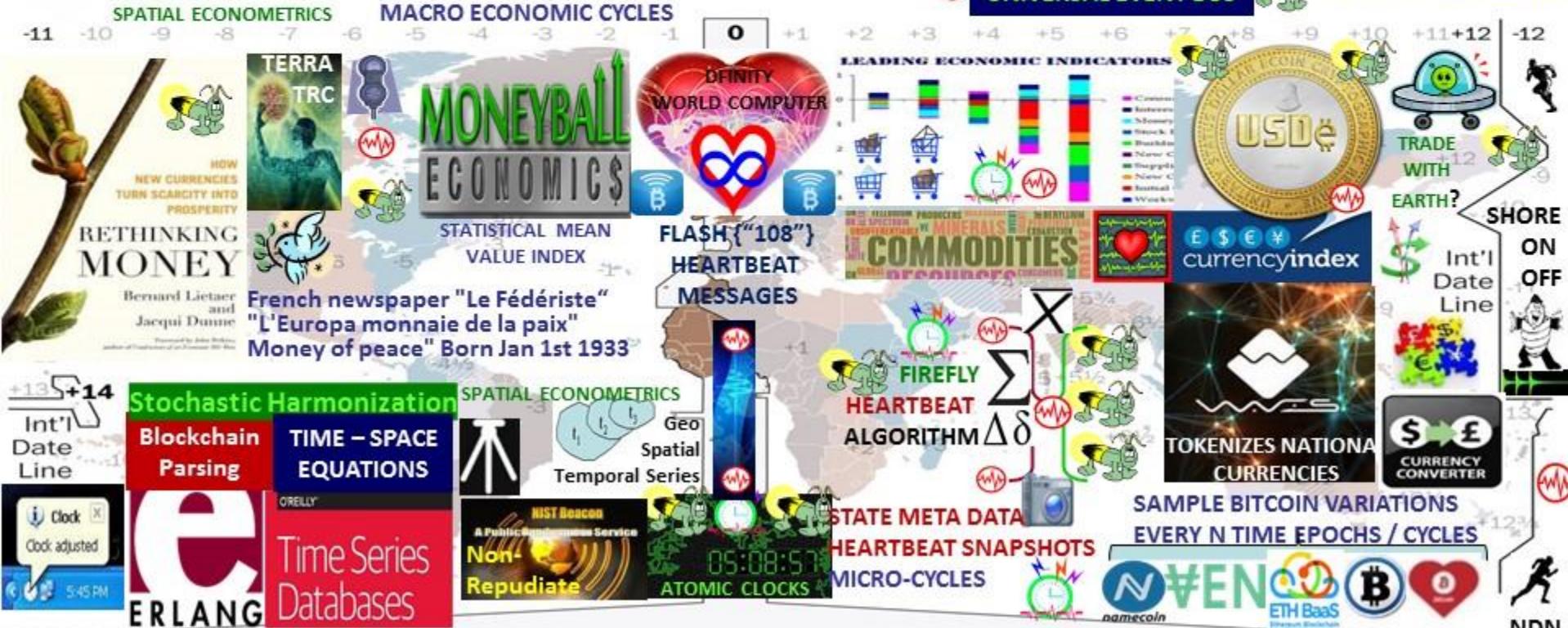








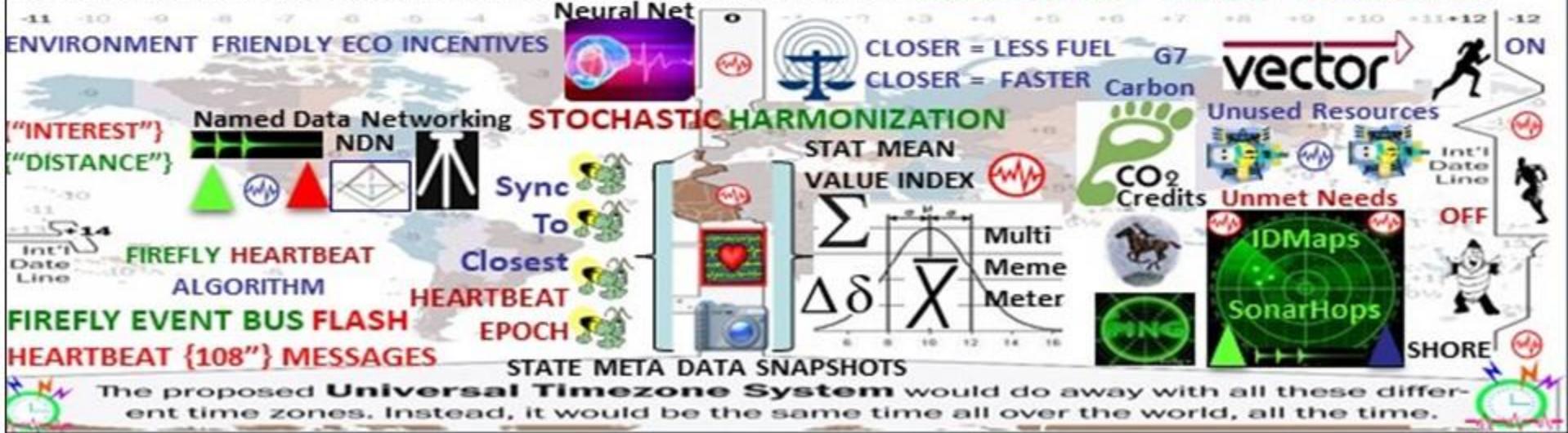
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The proposed **Universal Timezone System** would do away with all these different time zones. Instead, it would be the same time all over the world, all the time.



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**ALGORITHMIC SAMPLING PRICE, RATE, SPEED, TRANSACTION RATE PARITY ACROSS TIME ZONES UTZ**

**Server on / off floor adjust**

**IDMaps SonarHop**

**EQUILIBRIUM CONSTANT**

**NASH Equilibrium Algorithms**

**Time-Space Metrics**

**Nash Game Theory Algorithms**

**HB Cycle STATE META DATA SNAPS**

**STATE META DATA SNAPS**

**05:08:57 NIST TIME BEACON**

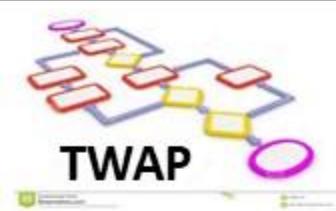
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# TWAP Algorithm Manages Bitcoin Price Volatility Algorithm

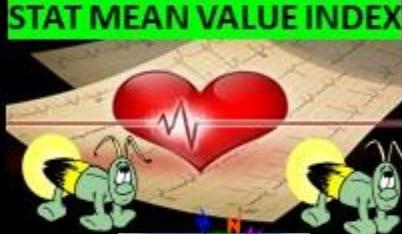


## TWAP GOAL: provide a Time Weighted Average Price Benchmark



FIREFLY HEARTBEAT ALGO  
STAT MEAN VALUE INDEX

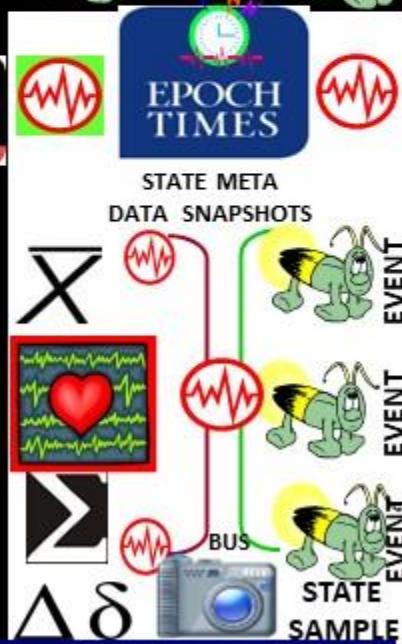
**TWAP Works To gauge trading performance, many traders in different asset classes (equity, fixed income, currency) often use average price as a benchmark. The two common ways to calculate an average are a time-weighted average price (TWAP) and a volume-weighted average price (VWAP). TWAP is the average price of a bitcoin over the course of a specified period of time i.e., Heart Beacon Cycle**



The algorithm trades over a desired time, either 1, 6, 12 or 24 hours and will give you a TWAP over that time period. For example, set the TWAP algorithm to sell 12 bitcoins over 12 hours, the algorithm will sell throughout the period, aiming to get a 12-hour TWAP



VWAP is price multiplied by number of bitcoins traded, then divided by the total number of bitcoins traded during a time period. The time-weighted average price algorithm is matched to closest HB



Firefly Heartbeat Sync nodes strive to sync in a distributed system. Nodes emit periodic "heartbeat" events at approximately the same time. There is no need to sync during a cycle as long as the cycle length is bounded & nodes eventually agree. HBC's improvement is stipulating a clock cycle value e.g., 5, 10, 15..

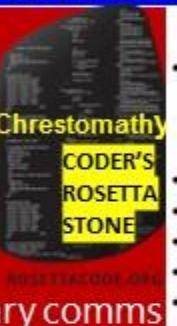




Erlang programming language / mini OS  
massively scalable high availability, real-time Erlang's runtime system built-in concurrency distribution, fault tolerance



- coordinate 1000's of virtual machines
- ...distributed Dbases RIAK, CouchDB
- ...real time data dashboards
- ...service oriented software architectures
- .. server, API endpoints . RabbitMQ
- ..distributed, multi-node architecture.
- protocol-aware load-balancer, stateful binary comms



**Functional Sequential Erlang**

- Data types:
  - Integers (incl. BigNums), floats, atoms
  - tuples/records, lists/plists, binaries, funs
  - Maps (added in R17)
- single assignment
- pattern matching & guards
- closures (anonymous function data type)
- list comprehensions
- bit-syntax & binary comprehensions
- tail recursion & tail call optimization (TCO)

SORTING ALGO'S

Ericsson Open Money  
For Society Patent App  
[20130166398](#) "System And Method For Implementing A Context Based Payment System."



"It is our vision that one day everyone with access to a mobile phone will be able to spend, send and receive money as easily as sending a text via SMS"  
"When money is open, the way we send, spend and receive money will change forever"



Rho ratio  $\frac{\text{Arrival Rate } \Delta \delta}{\text{Service Rate per unit time}}$

queueing systems  
stochastic processes, function  
scheduling Start, Stop TTL

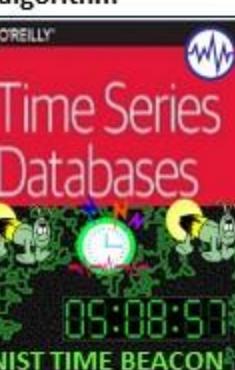


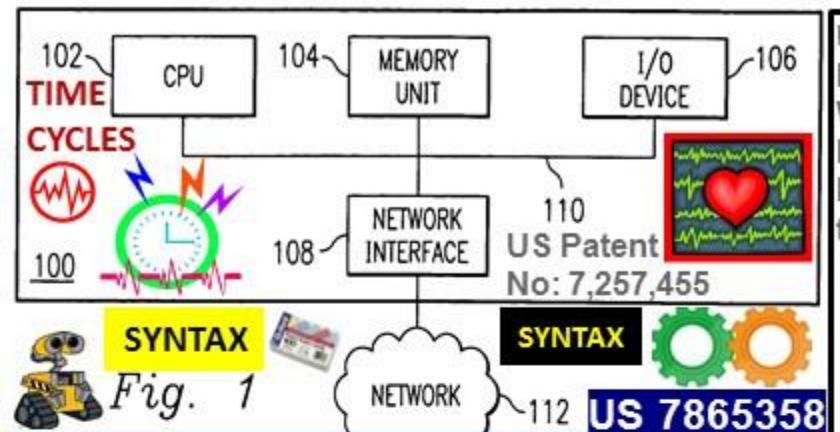
distributed "noSQL" database, embedded right into Erlang,  
supports indexing, replication, transactions, and fail-over  
Fast ETS in-memory, and DETS persistent on-disk database

**Mnesia database** ("Organization\_ID")

Global name resolution

XBRL / CDL / DAML
ALPHA NUMERIC
BREVITY CODES
AZURE BLETCHLEY
STRUCTURED
MILITARY MESSAGE
TEMPLATE FORMS
LOGIC / FILTERS



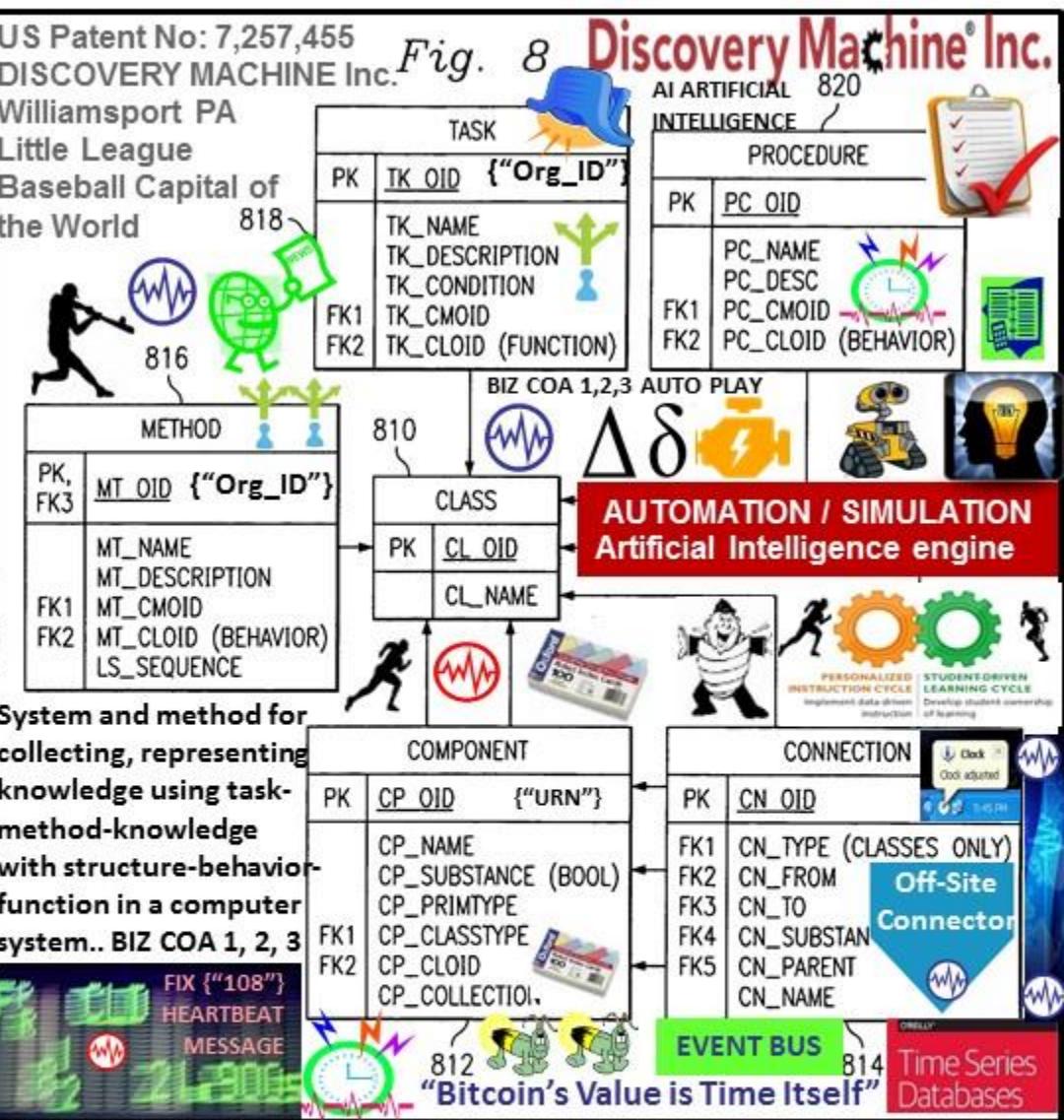
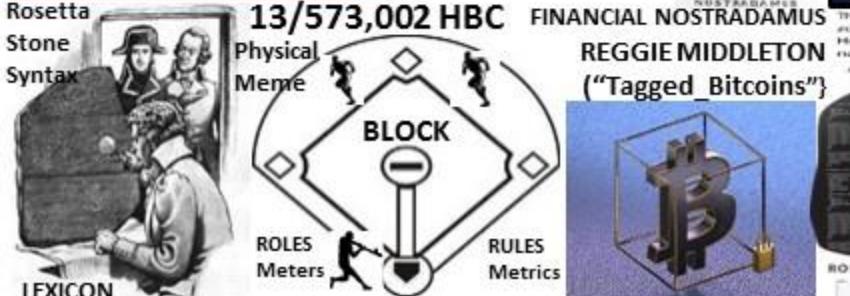


Machine-based system for transforming data from a source form to a target form, a tool is provided for sharing information established in developing a transformation model. The shared information may relate to rules for mapping source collection terms to standardized terms, rules for ordering or **SYNTAX**, rules for classifying terms or other transformation rules.

**US 7865358 CLAIM 1.** method converting textual data from source form to target forms, where target form differs from source form's linguistics, syntax

Multi-user functionality for converting data from a first form to a second form

ORACLE Veritaseum



Bitcoin Classic seeks to mitigate the problem of more transactions, which are causing transaction backlogs and increased transaction costs, by increasing the block size - the number of kilobytes in a block of transactions - from 1MB to 2MB.



ALL THINGS INTERNET FORMED W 1) TIME EPOCHS 2) SYNTAX



HASH TABLES  
NONCE VALUES

**BitPay Core:** limits: 1) block size 'hard limit' adjusted on a regular basis coinciding with difficulty adjustments, 2) miner set 'soft limit' like focal points in Unlimited.  $\Delta\delta$   $\times$



Bitcoin Unlimited: absence of a hard-coded block-size limit. Users manually set limits on their own nodes; Consensus on a limit expected to emerge naturally at Schelling focal point. Unlimited introduces a level of democracy into development, management of the implementation, the community votes on changes.



Microsoft Bletchley modular framework: choose combination of technologies best fits Biz domain

AZURE: Core/Kernel/Universal Protocol

Fabric Tier consortium node CryptoDelegate in VM or UTXO Adapter, (Azure, AzureStack, AWS..)

Unspent Transaction Output protocols UTXO

Crypto Tokenized Assets Digital Bearer Bonds  
unique identity for owned artifacts

Utility Cryptlets encryption, time & date events, external data access, authentication "CryptoDelegate" / adapter

Blockchain middleware: identity and operations management, data, intelligence services like analytics and machine learning. New middleware works with existing Azure services, like Active Directory and Key Vault

Blockchain Fabric: Blockchain Gateway Services [Interledge](#) like services to allow for SmartContracts and tokenized objects to be passed between different ledger systems.

Data Services - key data services like distributed file systems (IPFS, Storj, etc) of off-chain data referenced by public keys. Auditing, Advanced Analytics, Machine Learning, Dashboarding services for SmartContracts, Blockchains, Consortia, Regulators

Utility and Contract. Developers can discover and enlist Cryptlets into their SmartContracts to create more robust and trusted transactions. Contract Cryptlets are full delegation engines that act as SmartContract surrogates off the chain. Cryptlets provide execution logic and securely store data in the Smart Contract

Rosetta Stone Syntax



ALPHA NUMERIC  
BREVITY CODES  
SYMBOL CODES  
STRUCTURED  
MILITARY MESSAGE  
TEMPLATE FORMS  
LOGIC / FILTERS

The current standard time common throughout the world is UTC. There are time zones that are either 12 hours ahead or behind Coordinated Universal Time (UTC). However, these time zones are decided upon by individual governments, without overall coordination and can even extend fourteen hours ahead UTC.



MULTI-MEME MULTI-METER

Microsoft AZURE BLETCHLEY

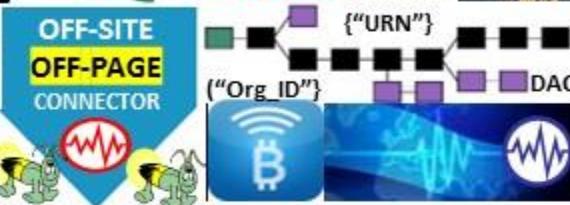


Blockchain Startups  
Top Blockchain startups disrupting non-financial markets  
Venture Radar



MYRIAD MEMES MEDIATION

BLOCKCHAIN



MACRO CYCLES

CLOCK FACE  
90 / 90 / 90 / 90  
= 360 degrees

METRICS / METERS

90 feet  
ALGORITHM = RULES  
PLAYERS = ROLES

UMPIRE = RULES

3rd Base

STATISTICIAN

Σ

90 feet

Blockchain Blocks / Coins Awarded

Survey Point

home plate

90 feet

Euclidian Geometry TRIANGULATION

Cube has Length, Depth, Height. Volume #1421

Blockchain Blocks / Coins Awarded

Survey Point

home plate

90 feet

Euclidian Geometry TRIANGULATION

Cube has Length, Depth, Height. Volume #1421

Blockchain Blocks / Coins Awarded

Survey Point

home plate

90 feet

BASEBALL "DIAMOND"

A diamond Is a square Is a block

2nd Base Runner = Messages Signals / Telemetry

90 feet

SC 573 US 134 2347 Physical = Opposite Of abstract

1st Base Coach first base UMPIRE

90 feet

3 x 5 HASH TABLE

NONCE VALUES / CODE

MICRO-CYCLES



1st Base Coach first base UMPIRE

90 feet

HASH TABLE

NONCE VALUES / CODE



IoT Microsoft Orleans

TIME-SPACE EQUATIONS ALGORITHMS BLOCKCHAIN PARSING ERLANG

EVENTBUS

STATE META DATA

CYCLE

SNAPSHOTS

HEART BEACON

STATE META DATA

CYCLE

SNAPSHOTS

HEART BEACON

EVENTBUS

STATE META DATA

CYCLE

SNAPSHOTS

HEART BEACON

STATE META DATA

CYCLE

SNAPSHOTS

HEART BEACON



real-time gross settlement system,  
currency exchange, remittance network

A.K.A Ripple Transaction Protocol or Ripple protocol, built on a distributed open source Internet protocol, consensus ledger and native currency called XRP. Ripple enables "secure, instant and nearly free global financial transactions of any size with no chargebacks." Ripple supports tokens representing fiat currency, cryptocurrency, commodity or any other unit of value such as frequent flier miles or mobile minutes. Ripple is based around a shared, public database or ledger, which uses a consensus process that allows for payments, exchanges and remittance in a distributed process.

Connects to receiving bank's Ripple Connect to exchange KYC, risk info, fees, payment details, expected time of funds delivery

Provides information about total costs of the transaction



Workflows are serially executed  
Except first two work flow are workflows are based on event

**pull model**



**Bitcoin Address Shortener**

Bitcoin Address Shortener is an Android app that you can use to shorten those lengthy bitcoin addresses! Simply enter a long Bitcoin address to have it transformed into a short one, and vice-versa! You can get it for free [here!](#)

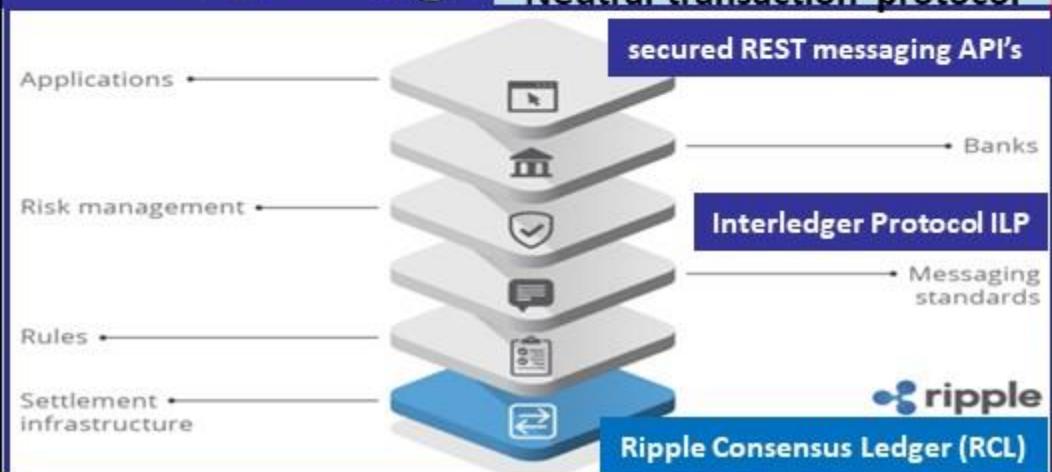
**ALPHA NUMERIC BREVITY CODES**

To retrieve addresses on your computer, use [bitcaddr](#).

**A.I**

Clock Clock adjusted

**Neutral transaction protocol**



SchellingPoint



**EVENT**

**ROLES RULES**

**COACH**

**BLOCK**

**CLOCK**

**TIME-SPACE EQUATIONS ALGORITHMS BLOCKCHAIN PARSING**

**ERLANG**

**EVENT BUS**

**LOCKED QUOTED ACCEPT / DENY In Progress SUCCEEDED**

{"108"} HEARTBEAT SYNC DELTA STATE META DATA SNAPSHOTS

MATCH EVENT REPORTS TO CLOSEST HEARTBEAT CYCLE

FLASH HEARTBEAT MESSAGES {"108"} Sync to Closest Heartbeat

**X**

**INFOCON**

5 4 3 2 1

**INFORMATION CONDITION**

**FIREFLY-HEARTBEAT ALGORITHM**

MICRO-CYCLE STATE META DATA SNAPSHOTS

AGGREGATE INTO MACRO ECONOMIC CYCLE MESSAGE

World Economic Heartbeat ALGORITHMIC REGULATION



"108"

**BLOCK TIME ARBITRAGE System of Systems Sync**

Stochastic Harmonization Telco Mesh Fabrics Wide Area Sync

**FIREFLY EVENTS FLASH MESSAGES**

**EVENT**

**DFINITY**

**RANDOM # BEACON**

**NIST Beacon**  
A Public Randomness Service

**QUANTUM RANDOM #**

**BLOCKCHAIN NERVOUS SYSTEM**  
HEARTBEAT {"108"} State Meta Data Snapshot Msgs

**STATEFUL DECENTRALIZED NET PROTOCOL:**  
Decentralized process workflows instead of  
Centralized Server farms

**FIREFLY-HEARTBEAT** FLASH Msg EVENT BUS

**GROUP Signature is random number**

- Number selects next group {"Org\_ID"} {"Org\_ID"}
- Next group use previous no. as message
- Verifiable Random Function
- Numbers verifiable using group public key
- New values produced in threshold agreement
- **Random members** {"Org\_ID"} {"Org\_ID"}
- Each process is a member of multiple groups
- Groups intersect, have +/- 400 members

**- BLS signature scheme**

- Math magic... If 51% of group members broadcast "signature shares" on a message, these are combined to create the group's threshold signature.

**HYPER GEOMETRIC PROBABILITY CALCULATOR**

**CONSENSUS / RANDOM BEACON**

Threshold relay chain generates randomness, records network metadata & validation tree "state root". State  $3 \times 5$  and updates to state stored on shards... State transitions passed to Validation Tree

**Each process has mining identity**

- Public key with meta data attached
- IDs mediate participation
- Private network: trusted dealer defines list
- Public network: CC security deposit, USCIDs

**Threshold Relay Chain techniques**

Probabilistic Slot Protocol (PSP) When Gh is selected, members start stopwatches!  
Choosing Leaders Randomness selects priority list block forgers at height h  
Short Term Convergence Correct processes build on highest scoring chain  
Threshold Timestamping group signs blocks at h until next group appends another.

**Scalable Global Validation Layer:** Each additional level of the tower validates new state transitions applied to storage shard, is built by processes selected by the RANDOM BEACON

**USPTO 13/573,002 HEART BEACON CYCLE TIME – SPACE METER**

USCt 573 134 2347 Alice Corp V CLS Bank = ABSTRACT IDEAS = NO NO = PHYSICAL MEMES

**MACRO CYCLES**  
**CLOCK FACE**  
 $90 / 90 / 90 / 90 = 360$  degrees

**BASEBALL "DIAMOND"**  
A diamond is a square is a block  
2nd Base  
Runner = Messages Signals / Telemetry

**METRICS / METERS**  
90 feet  
Euclidian Geometry TRIANGULATION:  
90 feet

**ALGORITHM = RULES**  
**PLAYERS = ROLES**  
**UMPIRE = RULES**

**BLOCK in 3D = CUBE**  
Cube has Length, Depth, Height. Volume #1421

**3rd Base**  
Blockchain Blocks / Coins Awarded

**STATISTICIAN**

**90 feet**

**Survey Point**

**home plate**

**SC 573 US 134 2347**  
Physical = Opposite Of abstract

**1<sup>st</sup> Base Coach**

**first base**

**UMPIRE**

**$3 \times 5$**

**HASH TABLE**

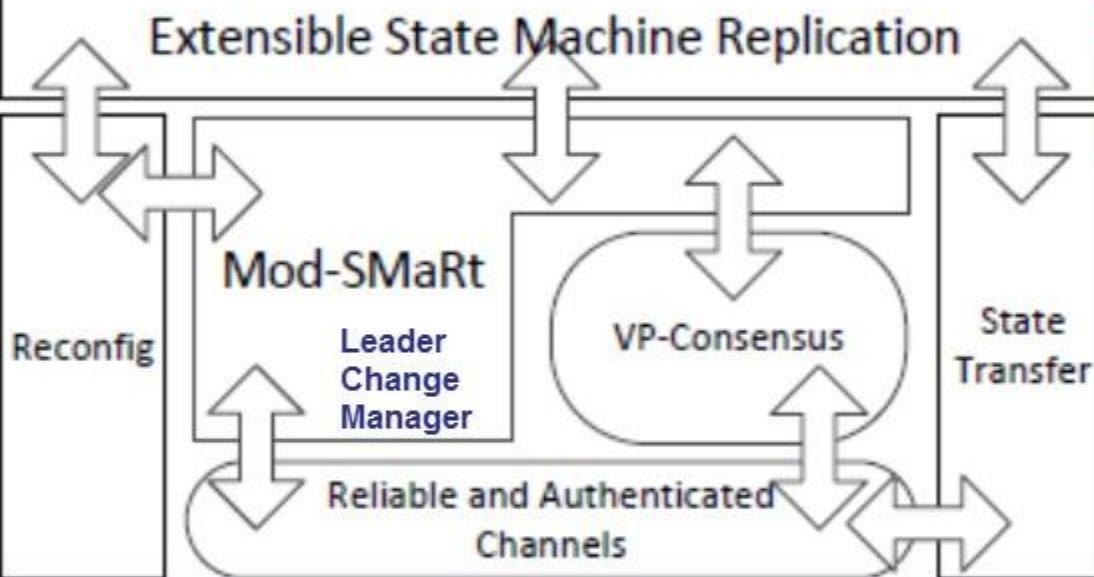
**NONCE**

**VALUES / CODE**

**MICRO-CYCLES**

## Byzantine Fault-Tolerant State Machine Replication

BFT-SMaRt dynamic distributed system processes are divided in two nonintersecting subsets: replicas and clients. Each system process has a unique identifier. During dynamic system execution, a sequence of views is installed to denote the reconfigurations due to replicas joins and leaves. A view is composed by a set of replicas identifiers.



Modularity is achieved using a set of building blocks (or modules) containing the core functionality of BFTSMaRt. Blocks are divided in three groups: communication system, state machine replication and state management.

### BFT-SMaRt needs an eventually synchronous system

Total order multicast is achieved using the Mod-SMaRt protocol and with the Byzantine consensus algorithm. Clients send requests to all replicas in cv, and wait for replies. replicas store each batch of ordered requests to a (stable) log and, periodically, take snapshots of the application state and store it in stable memory.

## USPTO 13/573,002 HEART BEACON CYCLE TIME-SPACE METE

USCt ALICE CORP V CLS BANK

PHYSICAL = OPPOSITE OF ABSTRACT

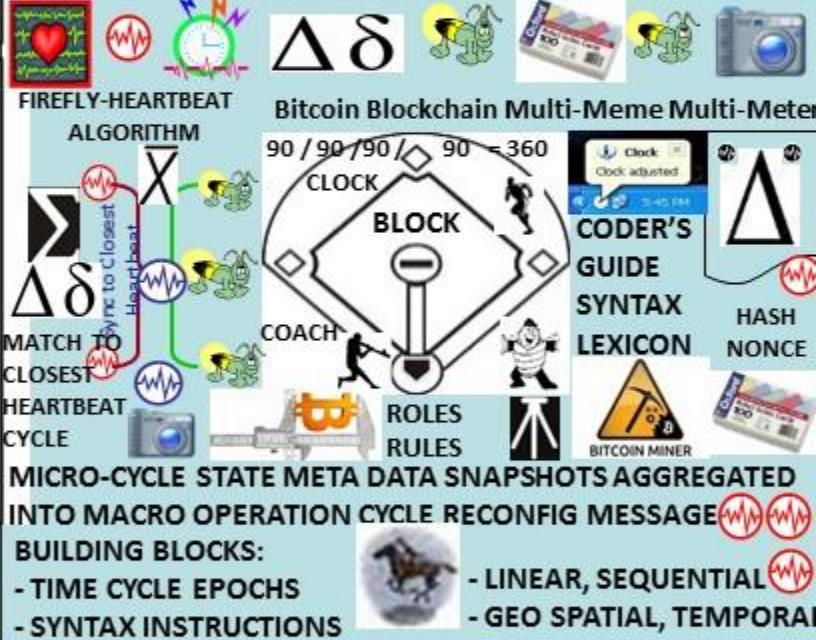


DERIVED FROM BATTLEFIELD DIGITIZATION DISTRIBUTED AUTONOMOUS ORGANIZATION DAO SYSTEM OF SYSTEMS

FEDERATED ID / ORGANIZATIONAL IDENTIFIER {"ORG\_ID"} ADDS, JOINS, DROPS, MOVES TO / FROM DAO

CHANGES IN STATE VIEWED IN "APPLIQUE' OVERLAY VIEWS

## K00.99 HEARTBEAT SYNC DELTA STATE META DATA SNAPSHOT



Firefly inspired Heartbeat Synchronization nodes strive to sync in a distributed system. Nodes generate periodic "heartbeat" events approximately at the same time. It differs from classical clock sync in that nodes are not interested in counting cycles to agree on the ID of the current clock cycle. There is no requirement to sync during a cycle length in real time as long as the length is bounded and all nodes AGREE ON IT EVENTUALLY"

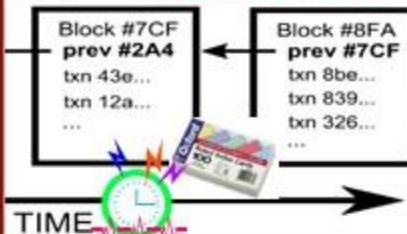
# HYPER LEDGER OPEN SOURCE BLOCKCHAIN

Core APIs, & SDKs

$\Delta\delta$  Shared Ledger



Code execution environment, ledger data structures, modular consensus fwk & algos, and modular membership services, modular storage and event fwks, network peers



HEART BEACON CYCLE  
TIME – SPACE METER  
USPTO 13/573,002

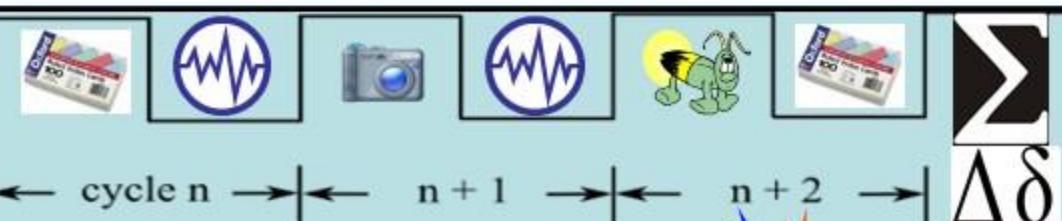
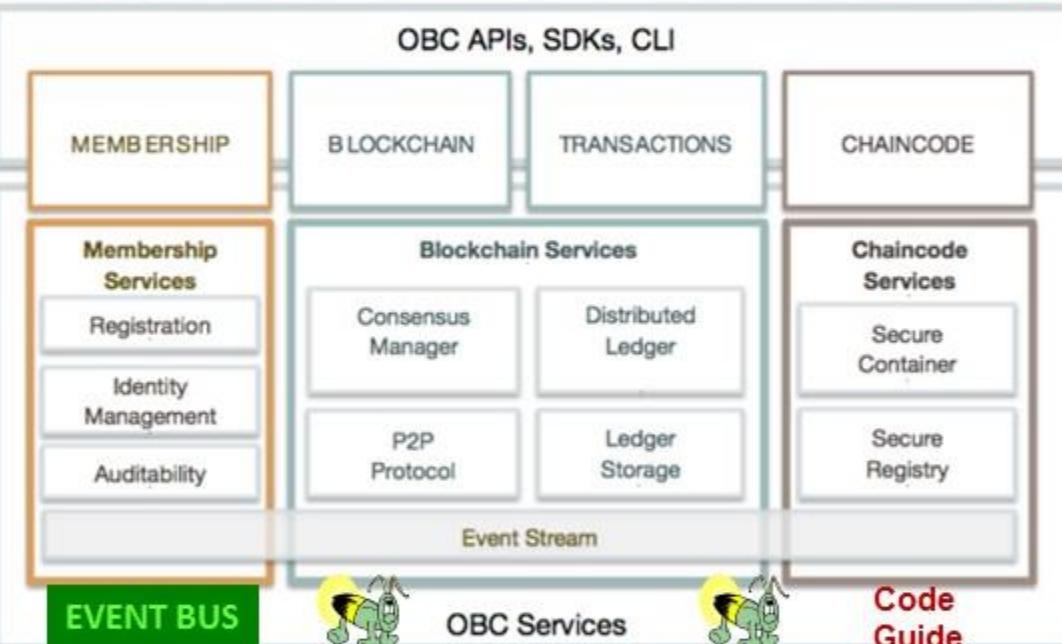
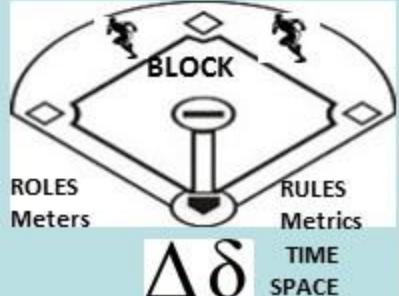
FEDERATION  
**Federation Gateway**

METRICS ("Organization ID")  
METERS

RESTFUL SYNC DELTA  
CHANGE MANAGEMENT  
MICRO-MACRO CYCLE



BLOCK TIME ARBITRAGE



MICRO-MACRO CYCLE SCHEDULE

ROSETTA STONE



300 + MESSAGE  
TEMPLATES  
USE CASES / GROUPED  
DATA TRANSACTIONS  
Alpha-Numeric Data  
Element ID -- #'s are the  
UNIVERSAL LANGUAGE

HYPER LEDGER USES  
JSON ("tag") / YAML  
Text indentation –  
UNIVERSAL LANGUAGE  
= ALPHA-NUMERICS

FFIRNS  
FFUDNS

e.g. Derivatives

e.g. Trade Finance

e.g. KYC / AML

App

App

App

App

App

App

App

App

App

## Concord Platform Services

CorDapp Store

Notaries

Network Map Service

Trusted Digital Backbone Network

Regulatory Reporting

Oracles

Service Provider Gateways

Bank-Internal Gateways

## Concord Vault Interoperability

Asset Registry

Trade Registry

Cash

Identity Vault

## Concord Operations Centre

Business Monitoring

Technical Alerting

Management Information

Compliance Audit



Δδ

Inter-Network Adapters

FEDWIRE

CHIPS

DTCC

CLS

## Corda Core Node Services

Agreement States

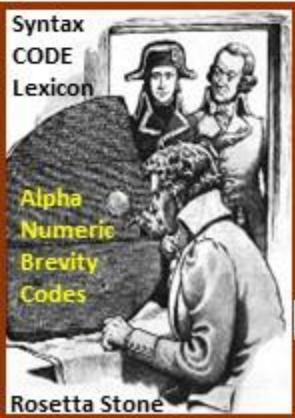
Transactions

Sandbox

Digital Signing

Interaction Protocols

Contract Verification



UNIVERSAL EVENT BUS



Syntax CODE Lexicon

STRUCTURED MILITARY MESSAGE TEMPLATE FORMS LOGIC / FILTERS

XBRL / CDL / DAML STOCK MIC CODES



300+ Use Case Templates



PROOF OF WORK



PROOF OF STAKE

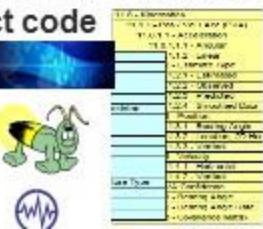


STATE CHANNELS



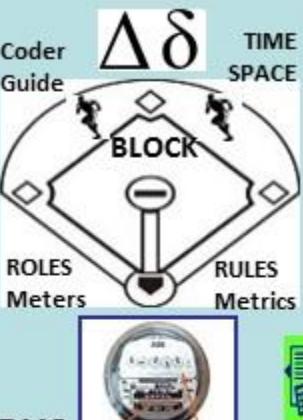
BITCOIN NEXGEN LIGHTNING / DASH..

Federation Gateway



## KEY BLOCKS:

- NO CONTENT = NULL
- LEADER ELECTION



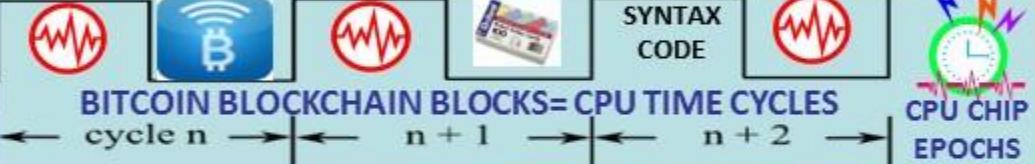
## MICRO BLOCKS:

- ONLY CONTENT
- NO CONTENTION



	FROM	TO	INFO
XBRL	CDL	DAML	
STRUCTURED	STOCK	MIC CODES	
MILITARY MESSAGE	TEMPLATE	FORMS	
LOGIC / FILTERS			
NDN			
SYNTAX			
LEXICON LIBRARY			

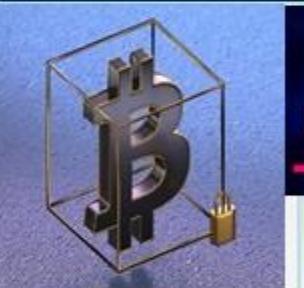
EVENT BUS



long exponential intervals (10 min)

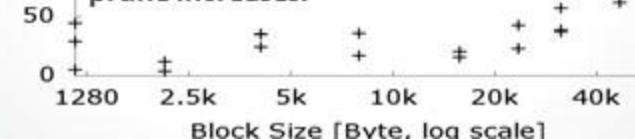


COMMAND SYNTAX  
RESTFUL State Transfer



Subjective Time to Prune

Additional metrics used by researchers included "time to prune", or the time it takes for miners whether they are on the correct "branch" or version of the blockchain they are processing transactions. As block sizes increase, suggested time to prune increases.



short deterministic intervals (10 sec)



MICRO-CYCLES



## ETHER: Compensate Resource Contribution

Gas: price to  
Run contract  
transactions

ethereum

Casper is a security-deposit based economic consensus protocol. Nodes = "bonded validators" place security deposit (an action called "bonding") If a validator generates an invalid action, account deposits are forfeited along with consensus privilege. Use of security deposits address "nothing at stake" problem; that behaving badly is not expensive. Casper is an **EVENTUALLY CONSISTANT** blockchain-based consensus protocol. CASPER favors availability over consistency (see the CAP theorem).



**Firefly - Heartbeat synchronization:** nodes in a distributed system generate periodic, local "heartbeat" events approximately at the same time with a goal of all nodes starting / ending cycles at the same time...

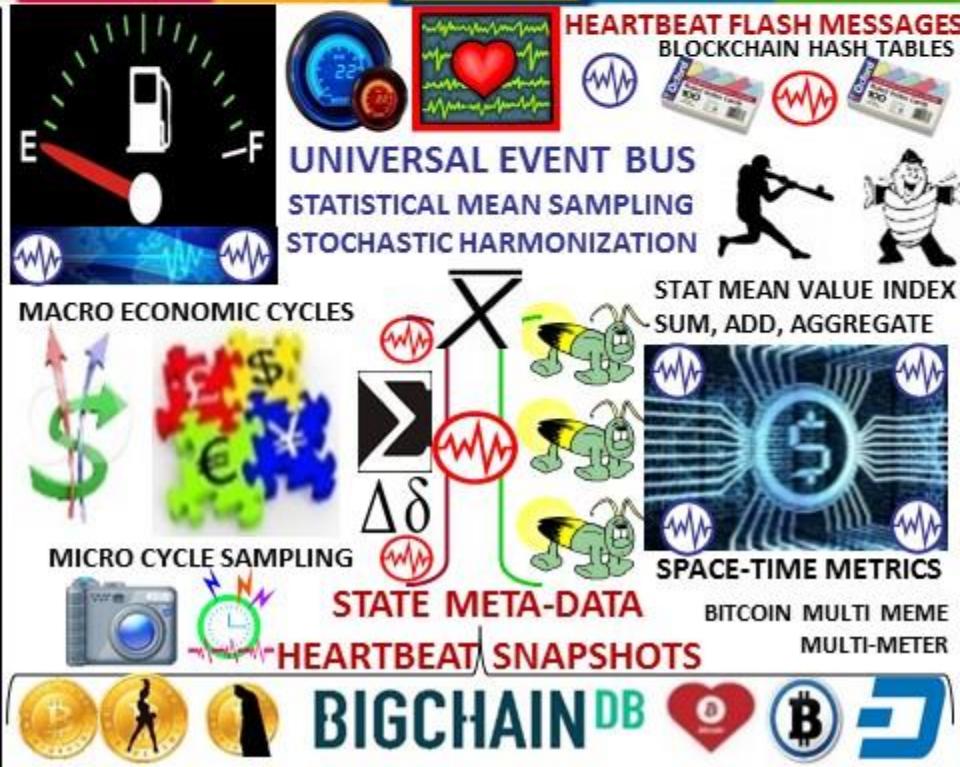
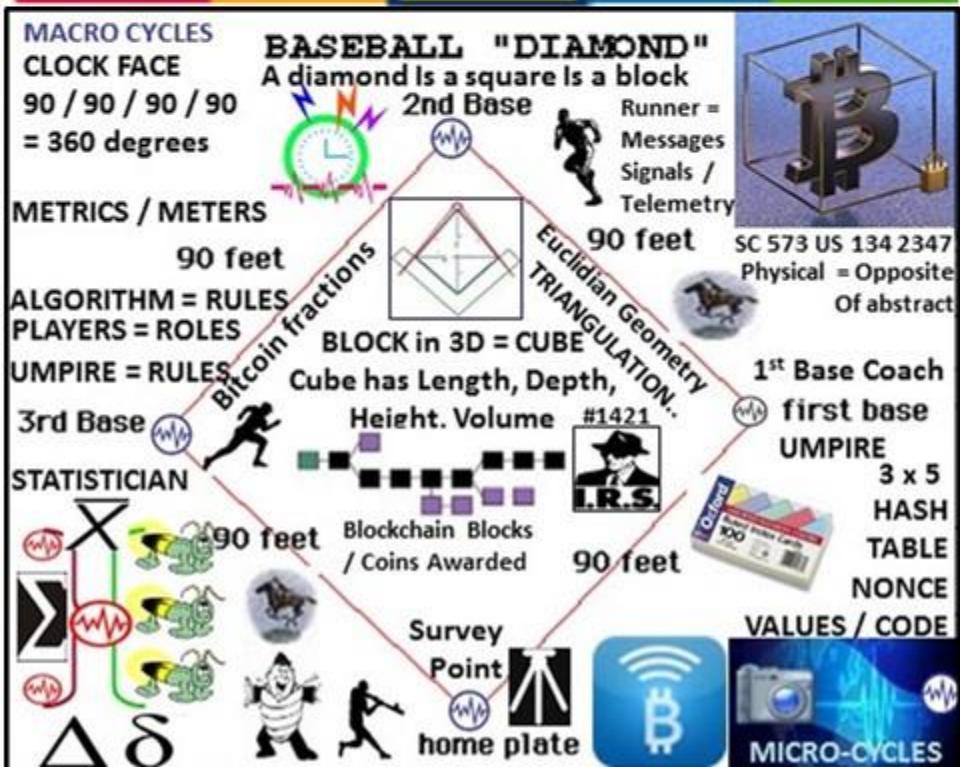
**EVENTUALLY**

Txs	State transition:	Txs	State transition:	Txs	State transition:
0cb4	123: 400	5581	905: 560	7ce6	123: 440
9f12	8723: 0	2fc3	1141: 8021	1141:	7981
	42: 15776		42: 15775		

**SWARM**  
(storage)

**WHISPER**  
(messaging)

**EVM**  
(consensus)



**MACRO CYCLES**  
**CLOCK FACE**  
90 / 90 / 90 / 90  
= 360 degrees

**METRICS / METERS**

90 feet

ALGORITHM = RULES

PLAYERS = ROLES

UMPIRE = RULES

3rd Base

STATISTICIAN

X

90 feet

Blockchain Blocks / Coins Awarded

90 feet

Survey Point

home plate

$\Delta \delta$

TRANSACTIONS

PER CYCLE

METRICS

cycle n

COMPUTER CHIP EPOCHS

n + 1

n + 2

SPATIAL

TEMPORAL Series

t<sub>1</sub> t<sub>2</sub> t<sub>3</sub>

PROOF-OF-STAKE

UXTO

Mined Bitcoins

Unmined Bitcoins

Survey Methods

Proximity Beacons

MICRO-CYCLES

CALENDAR

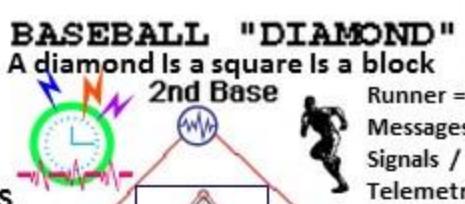
Unmined Bitcoins

Radar

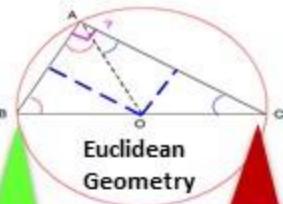
UTXO: unspent transaction output'. bitcoins sent somewhere

but not yet spent. Unspent transaction output set= latest

STATE of every Bitcoins ever mined" % Block Mined / % Block owned



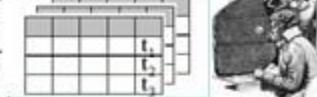
A BASEBALL DIAMOND IS A SQUARE. HBC USES A BASEBALL METAPHOR TO DESCRIBE METRICS, METERS. ROUNDING BASES FORM A BLOCK. METRICS, METERS & SURVEY METHODS MEASURE COIN MINING COMPLETION % AWARDS



## STRUCTURED {"CONTENT"} TEMPLATES

ROLE	NAME	DESCRIPTION
STRUCTURE	STRUCTURE	STRUCTURE
DATA	DATA	DATA
SYNTAX	SYNTAX	SYNTAX
SYMBOLS	SYMBOLS	SYMBOLS
LEXICON LIBRARY	LEXICON LIBRARY	LEXICON LIBRARY
LOGIC	LOGIC	LOGIC
FILTERS	FILTERS	FILTERS
CODE SEQUENCE	CODE SEQUENCE	CODE SEQUENCE
ROLES / RULES	ROLES / RULES	ROLES / RULES

## Attribute Series



Digital Asset Modeling Language DAML

Contract Description Language CDL

{"INTEREST"} {"DISTANCE"}



FBI

NDN

time ↑

distance →

FIX {"108"}

1: prove coin ownership <Org\_ID> Coin Issuer

2: # coins sent where, when Lat / Long, DTG

3: NIST Random # Beacon Non-Repudiation

4. Issuing {"Org\_ID"} adjudicates w buyers

## NAMED DATA NETWORKING

Time Series Value ↑ Time

FIX {"108"} time ↑ distance →

NDN

time ↑ distance →

1: prove coin ownership <Org\_ID> Coin Issuer

2: # coins sent where, when Lat / Long, DTG

3: NIST Random # Beacon Non-Repudiation

4. Issuing {"Org\_ID"} adjudicates w buyers

## FIREFLY-HEARTBEAT ALGORITHM EVENT BUS

O'REILLY

## Time Series Databases

CALENDAR

Coin Age proof-of-stake system combines randomization with the concept of "coin age," a number derived from the product of the number of coins times the number of days the coins have been held.

Randomized block selection randomization predicts following generator by using a formula that looks for the lowest hash value stake size

Voting based selection Instead of only using the stake size, the block generators can be selected by votes ex: League MVP

V O T E

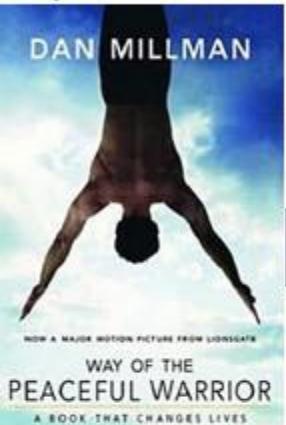
Little League BIG LEGACY 75 years





# Humanitarian Assistance Networked Donor System

H.A.N.D.S: "Based on the need to speed up the processes of influencing an adversary, new concepts result in the adaptation of military doctrine, organization, training, material, infrastructure, interagency interaction, leadership, personnel and facilities" ... German Bundeswehr : concepts of "Network Centric Warfare" in the United States of America, "Network Enabled Capabilities" in Great Britain or "Vernetzte Operationsführung" in Germany



"Shared situational awareness enables collaboration and self-synchronization, and enhances sustainability, speed of command"

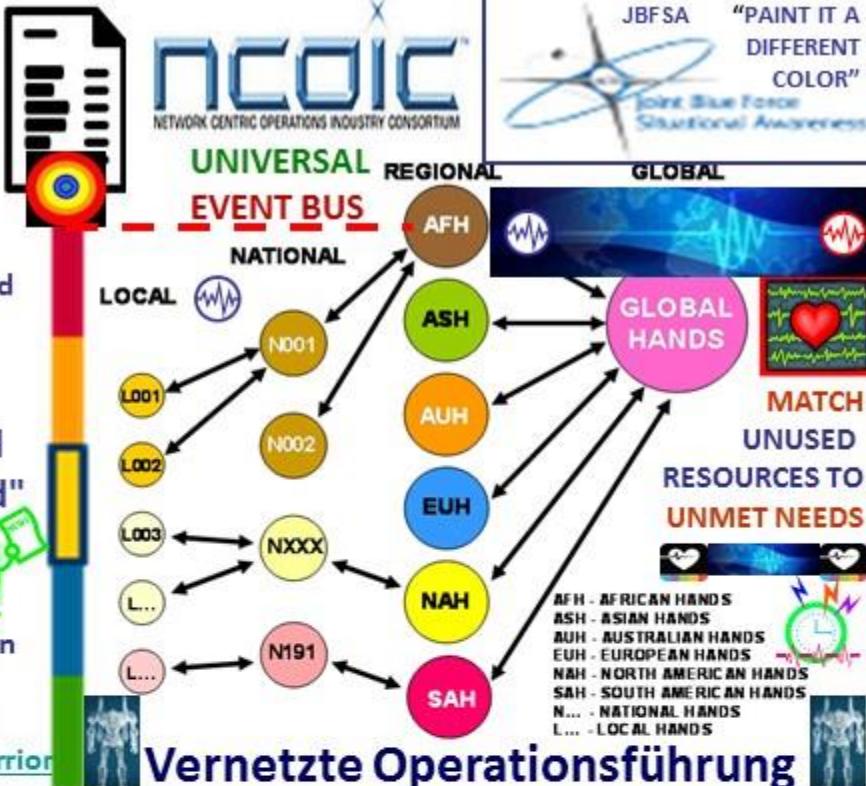


"The secret of change is to focus all of your energy, not on fighting the old, but on building the new." Dan Millman  
Way of the Peaceful Warrior A Book That Changes Lives  
[http://en.wikipedia.org/wiki/Way\\_of\\_the\\_Peaceful\\_Warrior](http://en.wikipedia.org/wiki/Way_of_the_Peaceful_Warrior)

Derive best practice procedural template guides from Battlefield Digitization describing when, where, how, how often systemically among a systems of systems promoting synergy, synchronicity.



The sculpture, similar to a lighthouse, is an interactive enclosure of light, color, and sound acting as a symbol of hope and resilience for the community. Pulses create a thumping sound that resonates through the steel frame and flickers the lighting matching the pattern to their heartbeat. By measuring a small, internal element such as a heartbeat and amplifying it to a monumental scale the piece becomes a powerful reflection of individual life and reminder of what is worth saving.



## Vernetzte Operationsführung

REUSE OF A PENTAGON ACAT-1A SITUATION  
AWARENESS PROGRAMS WORDS TO PLOWSHARES  
PROPOSED BY GERMAN MILITARY CIRCA 2003

## FEDERATION



**STATE:** stored data at a given instant in time

**STATE CHANNELS:** blockchain interactions

which *could* occur on the blockchain, but instead get conducted *off* of the blockchain, without significantly increasing the risk of any participant.

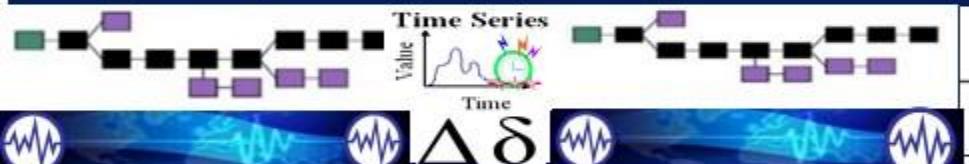
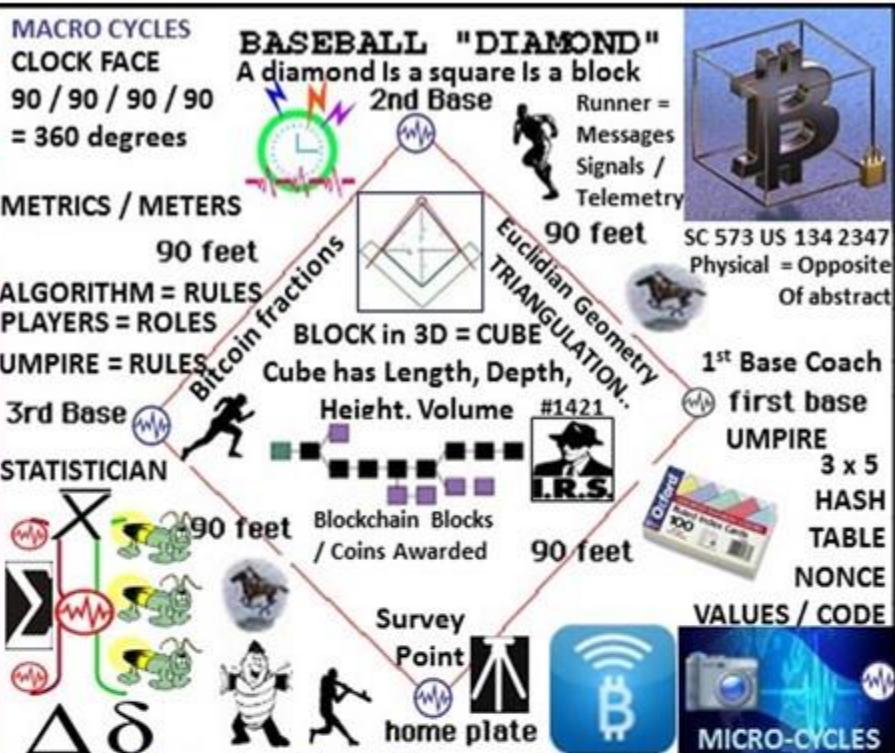


**1. Part of the blockchain state is locked** via multisignature or some sort of smart contract, so that a specific set of participants must completely agree with each other to update it.

**2. Participants update the state amongst themselves** by constructing and signing transactions that *could* be submitted to the blockchain, but instead are merely held onto for now. Each new update "trumps" previous updates.

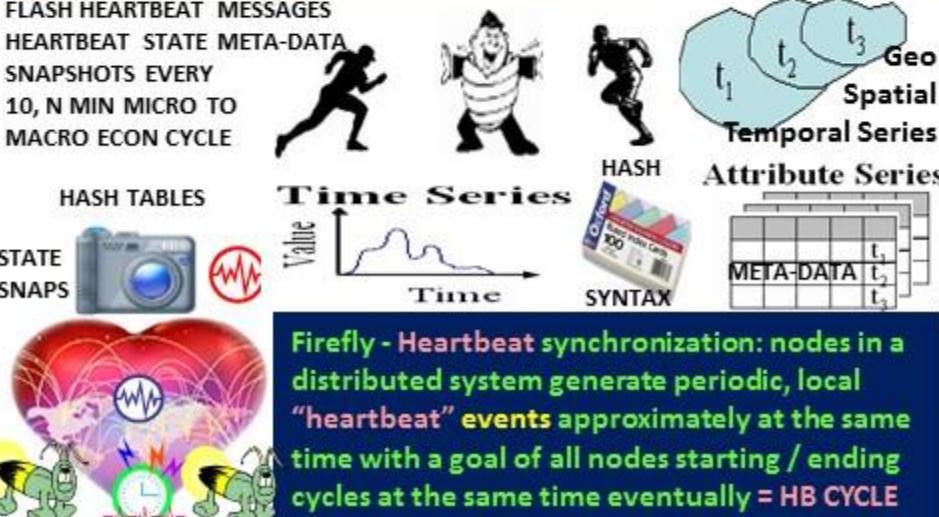


**3. Finally, participants submit the state back to the blockchain,** which closes the state channel and unlocks the state again (usually in a different configuration than it started with).



**EACH NEW UPDATE TRUMPS THE PREVIOUS:** simplest way is to have any unlocking attempt start a timer, during which any *newer* update can replace the old update (restarting the timer). When the timer completes, the channel is closed and the state adjusted to reflect the last update received. The length of the timer would be chosen for each state channel, balancing the inconvenience of a long channel closing time with the increased safety it would provide against internet connection or [blockchain problems](#). Alternatively, one could structure channel with a financial penalty so anyone publishing an inaccurate update to the blockchain will lose more than gain by pretending later transactions didn't happen.

[LINK:](http://jeffcoleman.ca/state-channels/) <http://jeffcoleman.ca/state-channels/>





# PROOF-OF-WORK



THE PROBABILITY OF MINING A BLOCK IS DEPENDENT ON HOW MUCH WORK IS DONE BY THE MINER



TIMESTAMP marks the point that work started. Additionally, it contributes to the uniqueness of the work by an individual miner



THROTTLE equivalent to difficulty. State  
•target = maximum value of 8 bytes  
Snap  
( $2^{64}$ ) divided by the difficulty.

NONCE increments from 0..N until the target is met.



GUESS stores the guess  
Effectively, it begins at infinity.



**Proof-of-Work:** users perform some form of work to participate. Work must be difficult for the client but easy for the server/network to verify. POW determines the approximate time between blocks = rate that new bitcoins are created. Work is submitted as a message/timestamp payload with a nonce value. Payloads are made unique through use of public key encryption or address.Nonce allows checking the work without retracing all the procedural steps.

## OREILLY Time Series Databases



## FIREFLY-HEARTBEAT ALGORITHM STOCHASTIC HARMONY ACROSS TIME ZONES



- MESSAGE ex:
  - Hashing string
  - Hash Table

## 300+Message Templates

LOGIC FILTERS	LOGIC GATES
SYNTAX LIBRARY	LEXICON
CODER'S GUIDE	

MACRO CYCLES  
CLOCK FACE  
 $90 / 90 / 90 / 90$   
= 360 degrees

BASEBALL "DIAMOND"  
A diamond Is a square Is a block  
2nd Base



Runner = Messages Signals / Telemetry  
90 feet

SC 573 US 134 2347  
Physical = Opposite Of abstract

METRICS / METERS

90 feet

ALGORITHM = RULES  
PLAYERS = ROLES



1<sup>st</sup> Base Coach  
first base  
UMPIRE

UMPIRE = RULES

#1421

3rd Base

3 x 5

STATISTICIAN

HASH TABLE

X

NONCE

90 feet

VALUES / CODE

Σ

MICRO-CYCLES

BlockChain Blocks / Coins Awarded

t<sub>1</sub>, t<sub>2</sub>, t<sub>3</sub>

Survey Point

home plate

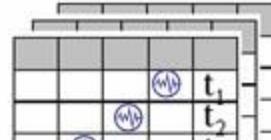
Δδ

Δδ

home plate

home plate

POW PAYLOAD :  
COMBINATIONS OF  
ENCRYPTED SYNTAX  
Attribute Series





## ETHER: Compensate Resource Contribution

Gas: price to  
Run contract  
transactions

ethereum

Casper is a security-deposit based economic consensus protocol. Nodes = "bonded validators" place security deposit (an action called "bonding") If a validator generates an invalid action, account deposits are forfeited along with consensus privilege. Use of security deposits address "nothing at stake" problem; that behaving badly is not expensive. Casper is an **EVENTUALLY CONSISTANT** blockchain-based consensus protocol. CASPER favors availability over consistency (see the CAP theorem).



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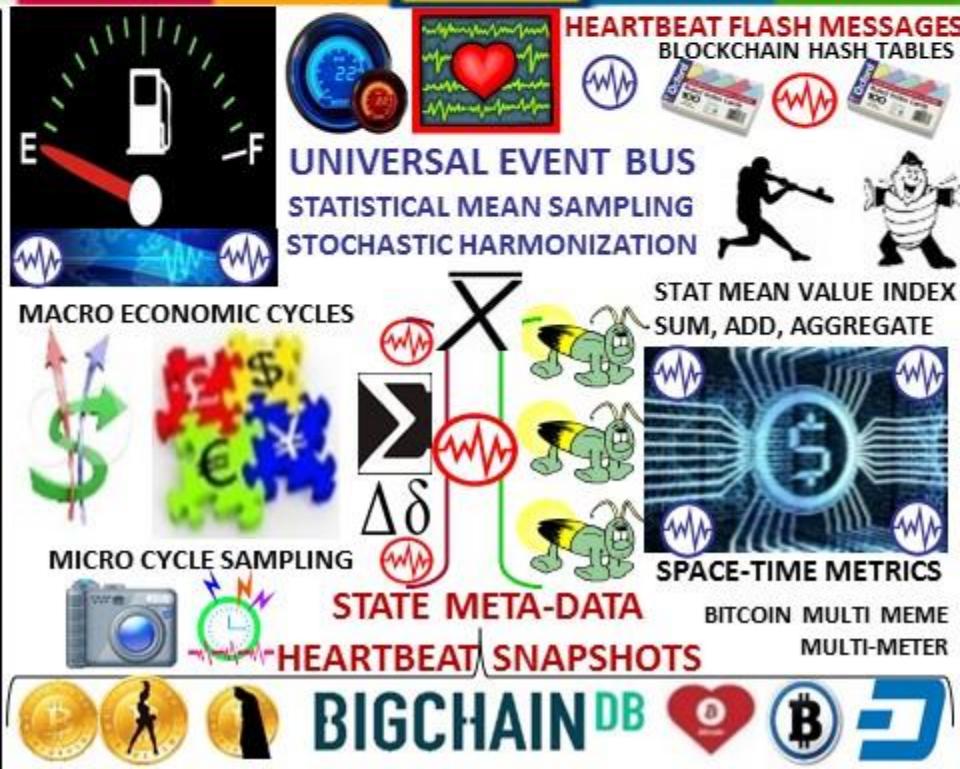
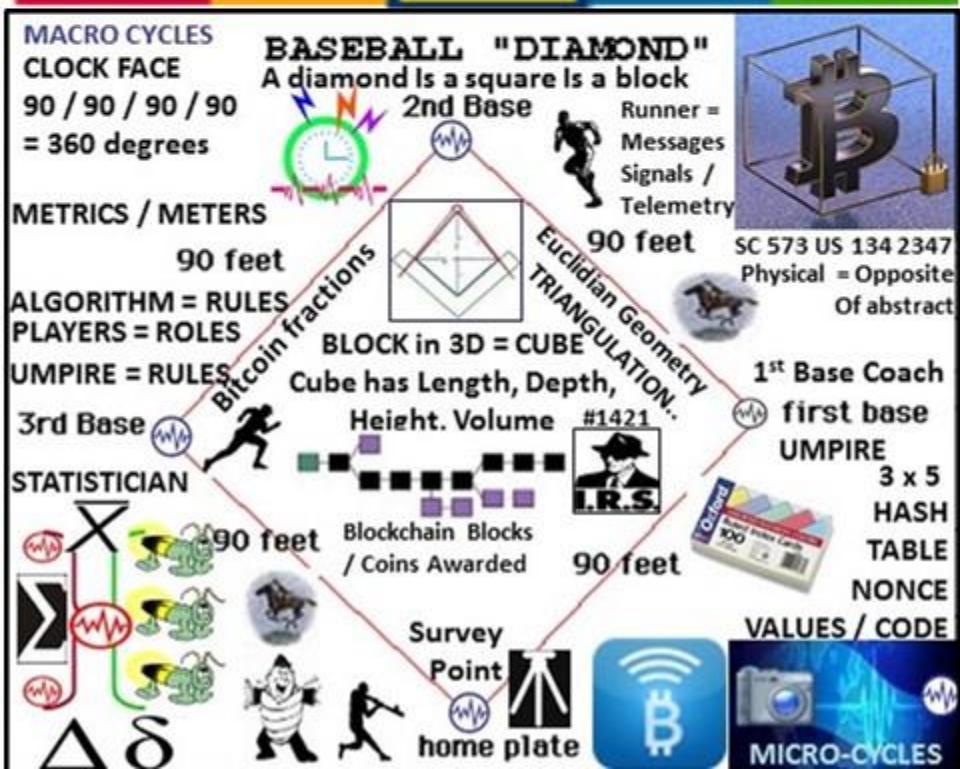
**EVENTUALLY**

Txs	State transition:	Txs	State transition:	Txs	State transition:
0cb4	123: 400	5581	905: 560	7ce6	123: 440
9f12	8723: 0	2fc3	1141: 8021	1141:	7981
	42: 15776		42: 15775		

**SWARM**  
(storage)

**WHISPER**  
(messaging)

**EVM**  
(consensus)





**PROJECT LIGHTING**

**FIREFLY - HEARTBEAT ALGORITHM**

**FIREFLY - HEARTBEAT**

**ERLANG**

**Time Series Databases**

**UTZ UNIVERSAL TIME ZONE SYNC**

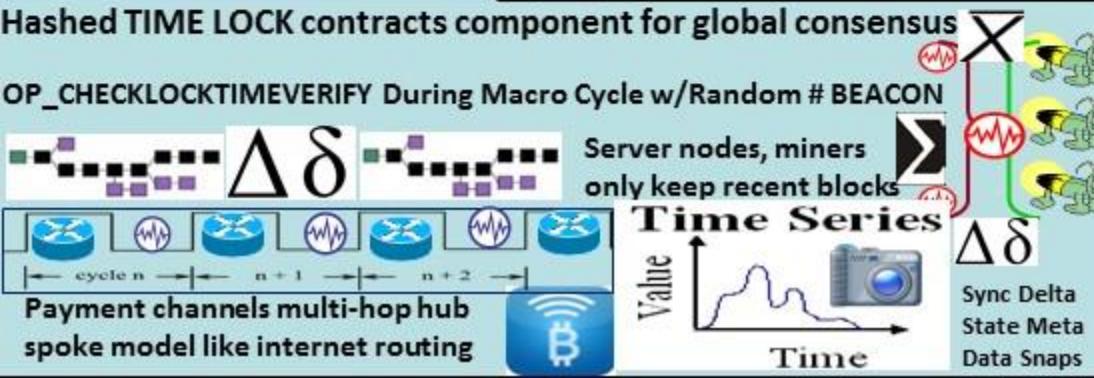
**OP\_CHECKLOCKTIMEVERIFY During Macro Cycle w/ Random # BEACON**

**Payment channels multi-hop hub spoke model like internet routing**

**transactions sent over off blockchain micropayment channels**

**OREILLY**

**Stochastic Harmonization**



**Segregated witness = Separated signatures**

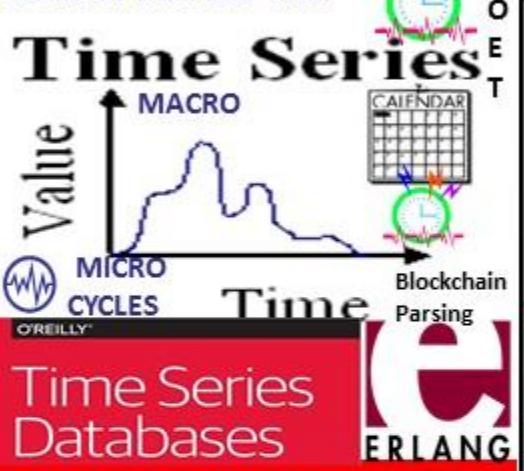
- signatures are cryptographic proofs also known as witnesses
  - moving signatures out of transactions
  - keeping a separate repository of the signatures
  - making them optional in propagation and storage
  - signature are the biggest part of transactions
  - can be implemented as a **soft-fork** vs a **hard-fork**

# SAWTOOTH LAKE POETIC CONSENSUS PROOF OF ELAPSED TIME: POET

"PoET for 'Proof of Elapsed Time', is a **lottery protocol** that builds on trusted execution environments (TEEs) provided by Intel's [Secure Guard Extensions] to address the needs of large populations of participants. The second, **Quorum Voting**, is an adaptation of the Ripple and Stellar consensus protocols and serves to address the needs of applications that require immediate transaction finality."



## PROOF OF ELAPSED TIME



Voting Based Selection: stake size & block generators selected by votes

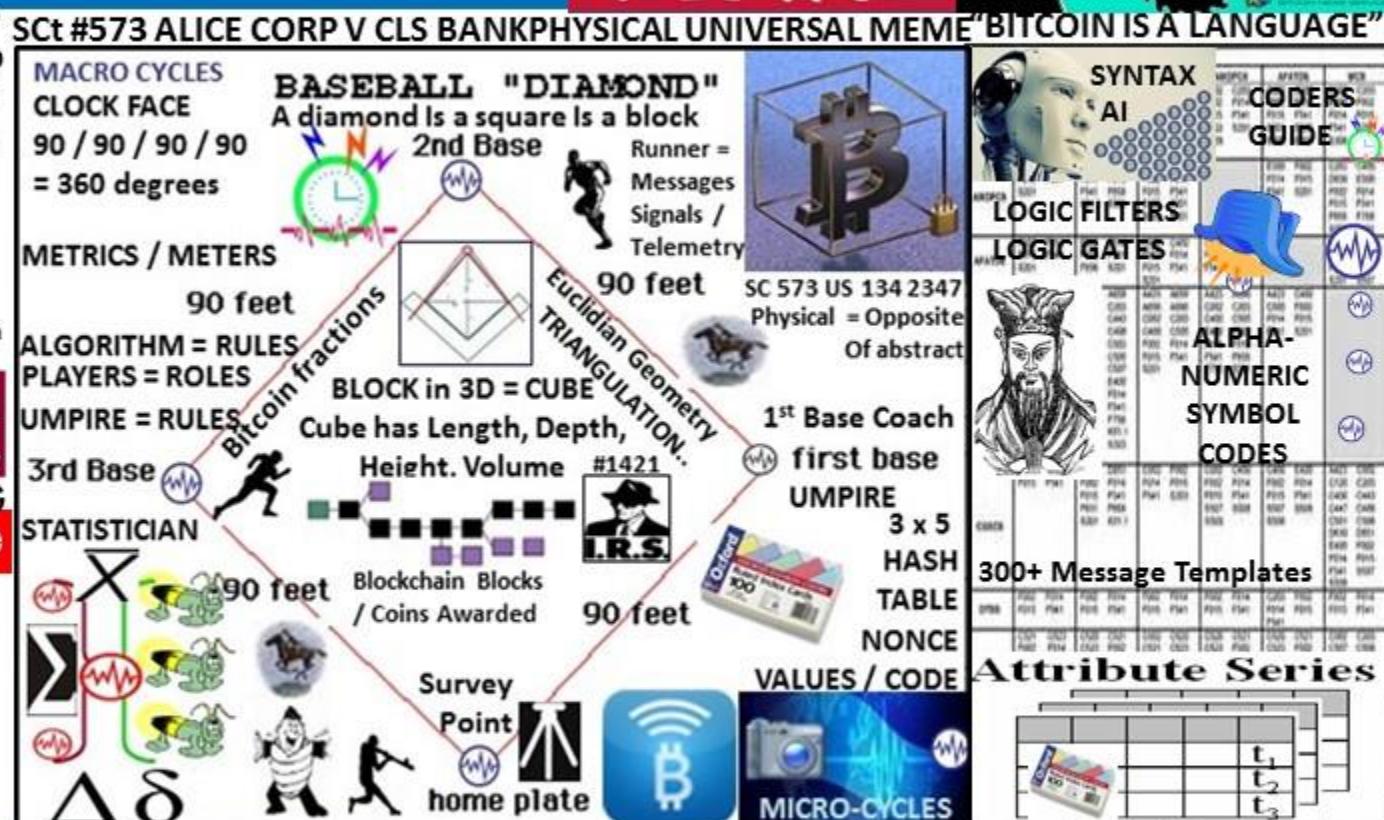
Voting based selection Instead of only using the stake size, the block generators can be selected by votes  
ex: League MVP

MVP



Robert's Rules quorum = minimum # of voting members who must be present at meetings to conduct business of the group

## TOURNAMENT LEAGUE BOARD



## FIREFLY-HEARTBEAT FLASH MESSAGES UNIVERSAL EVENT BUS



Capture ledger's state  $\Delta \delta$   
Transaction language  
changes ledger state  
Consensus, transaction acceptance protocol



**Block-Weighted-Average-Price (B-WAP) API** creates a USD price for any block in the Bitcoin blockchain, based on BNC's Bitcoin Liquid Index (BLX). Automatically appropriates blockchain transactions with a USD price or technical indicator for traders.

#### Key Features:

Look up any bitcoin blockchain transaction and receive back a USD value for any transaction.



Built using historic bitcoin price index - the [BNC BLX](#).

API updated every 10 min with a 2 hour delay on latest blocks (due to the nature of Block propagation to ensure avoidance of publishing rates on orphaned blocks).

All rates time-stamped in UTC.



Ability to look up by time-stamp.

Ability to look up by block-height.

Asset Classes: Digital Currencies

Get by: Block-height, Time-stamp or Transaction

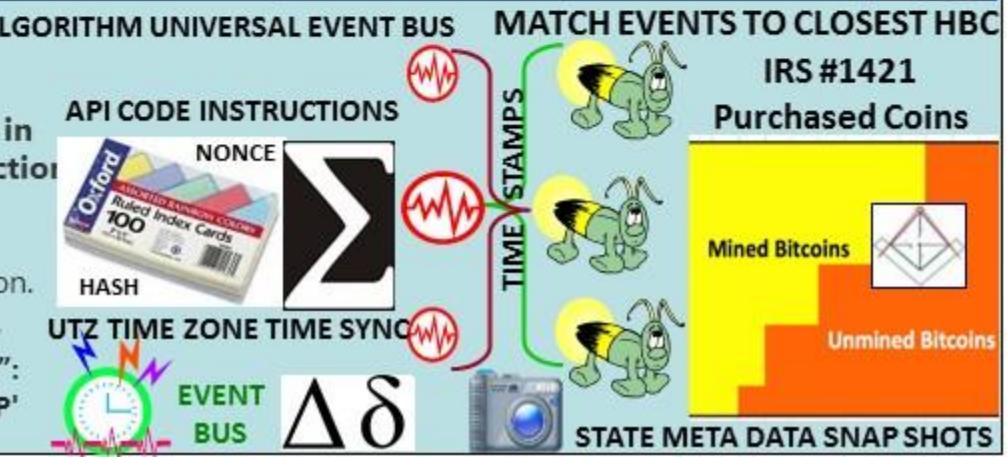
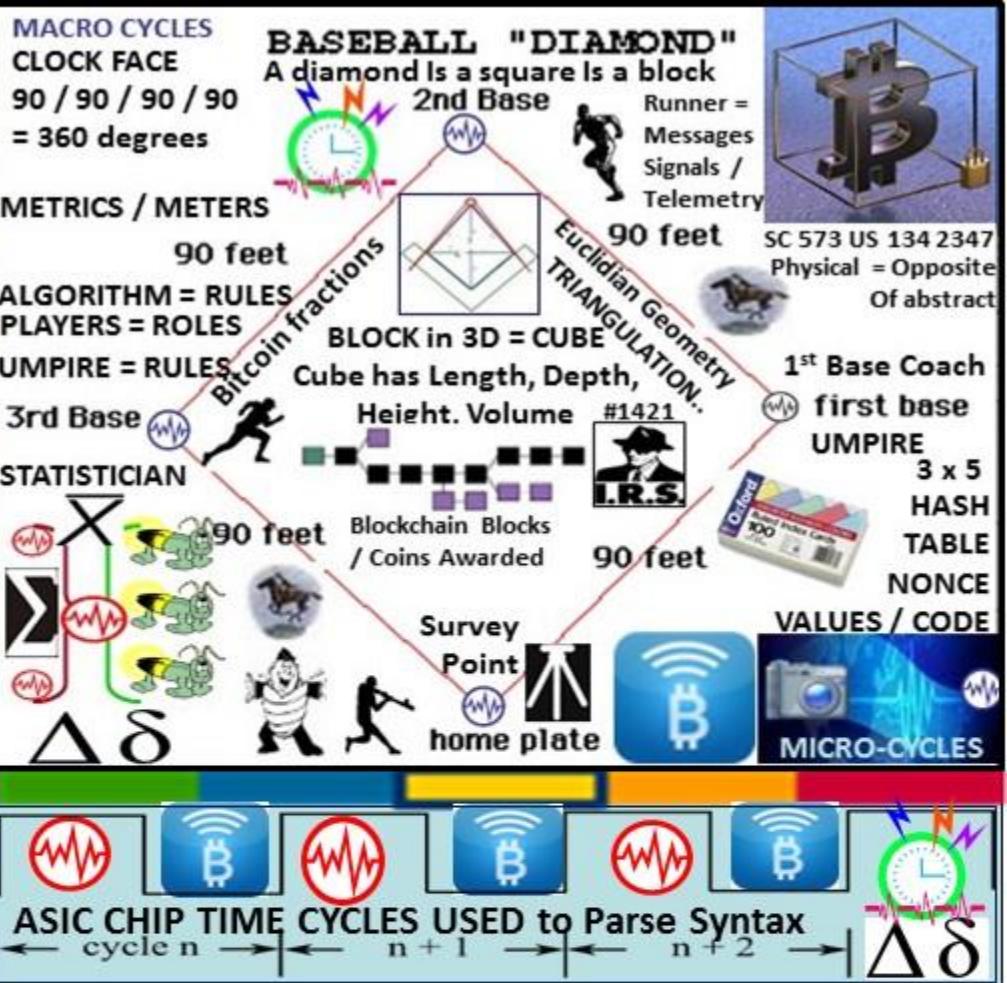
Transaction ID, Block ID, time-stamp, BWAP per block, Value in USD. BTC per transaction, bitcoin transaction fees per transaction

• Exchanges Covered: Price discovery for the B-WAP comes from utilizing the BNC [Bitcoin Liquid Index](#) (BLX) bitcoin price calculation.

• Historical Rates: This API goes back to 2010-07-17 23:14:35 UTC.

**BRAVE NEW COIN.**  
Digital Currency Insights

"Blocks are a measure of time":  
The Bitcoin Blockchain 'B-WAP'



# DASH



"All decentralized, blockchain-based networks are DAOs, or decentralized autonomous organizations" Bitcoinist

"A DAO can be summed up as an organization of people who communicate with each other via a "network protocol," which is to say that they communicate with one another via a ruleset"

[LINK](http://bitcoinist.net/how-dash-dao-work/) <http://bitcoinist.net/how-dash-dao-work/>

"all digital currency networks, the base layer of people generating the blockchain — "miners," "stakers," "witnesses," "validators," or "forgers" — all get paid to do so" "consensus," or an agreement upon what the rules should be; and second, the execution of said rules.

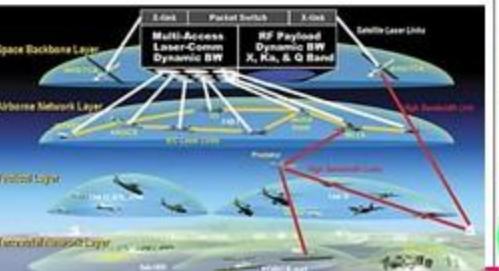
"Its makeup is thus: the block reward is divvied up in three parts. The first 45 percent goes to [Dash's miners](#). Another 45 percent goes to its Masternodes. And 10 percent is set aside to fund whatever other jobs or expenditures the Dash network deems necessary"

**InstantX:** To solve the problem of lag time in transactions, Masternodes are able to instantly lock transactions.

Masternodes receive payments for their service to the network.

**DAO: RAND THINK TANK TERM COINED + / - 2001**

NETWORK CENTRIC WARFARE  
Developing and improving information superiority



**MACRO CYCLES**  
**CLOCK FACE**  
90 / 90 / 90 / 90  
= 360 degrees

**METRICS / METERS**

90 feet

**ALGORITHM = RULES**  
**PLAYERS = ROLES**

**UMPIRE = RULES**

3rd Base

**STATISTICIAN**

90 feet

Blockchain Blocks / Coins Awarded

Survey Point

home plate

$\Delta\delta$

**BASEBALL "DIAMOND"**  
A diamond is a square is a block  
2nd Base  
Runner = Messages Signals / Telemetry  
90 feet



Euclidian Geometry TRIANGULATION..

1<sup>st</sup> Base Coach first base UMPIRE

3 x 5 HASH TABLE

NONCE

VALUES / CODE

MICRO-CYCLES



STOCHASTIC HARMONIZATION FIREFLY-HEARTBEAT EVENT BUS

HEART BEACON CYCLE = IMPROVEMENT TO NETWORK CENTRIC WARFARE



Firefly - Heartbeat synchronization: nodes in a distributed system generate periodic, local "heartbeat" events approximately at the same time with a goal of all nodes starting / ending cycles at the same time eventually = HB CYCLE



# What happens if we think about Bitcoin through the lens of *land*?

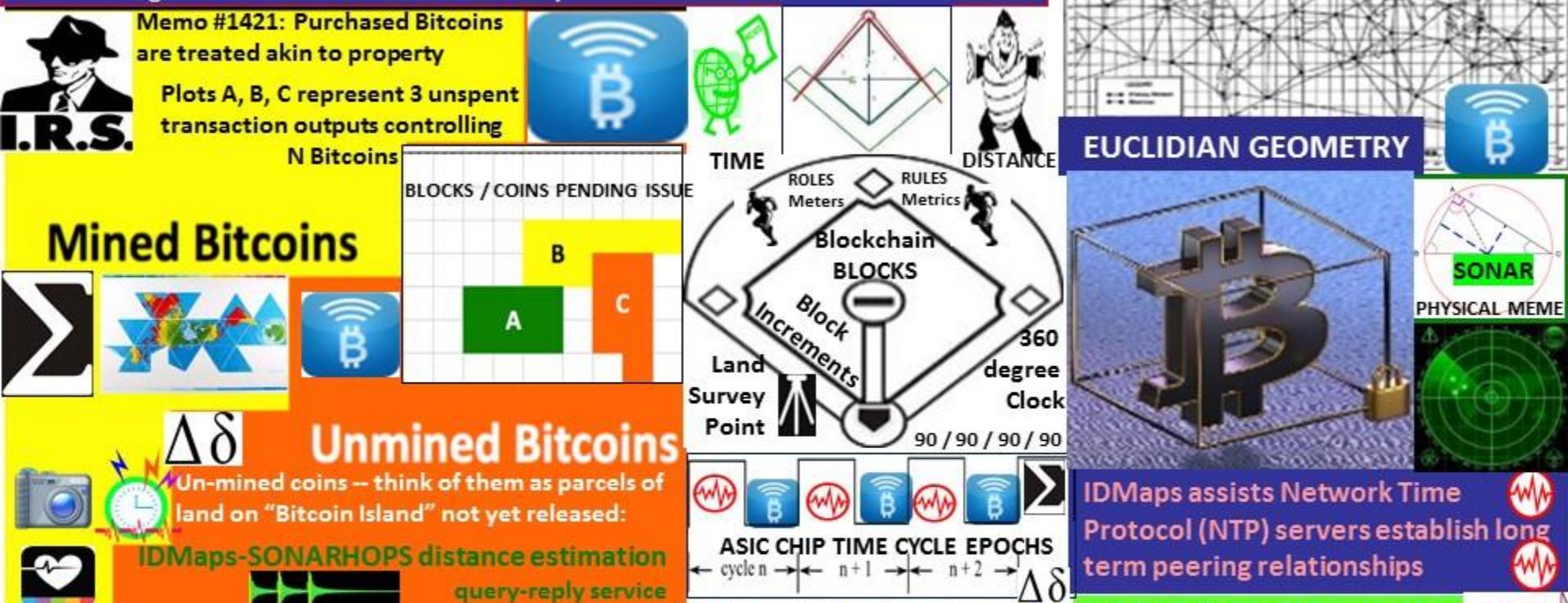
HEART BEACON CYCLE

USPTO 13/573,002

SURVEY METHODS

SC ALICE CORP VS CLS BANK: "claims may not direct towards abstract ideas"

UTXO: unspent transaction output'. bitcoins that have been sent somewhere but not yet themselves been spent. The set of all unspent transaction outputs (UTXOs) can be thought of as the latest STATE of every bitcoin that has ever been mined.



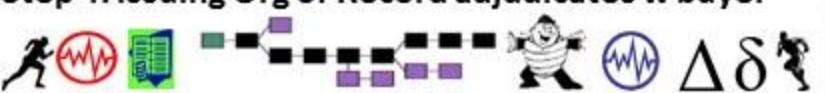
- End-state Bitcoin quantity will be fixed like land  
"Bitcoin as protocol of ownership, not transfer"  
Coins never travel, but simply switch owners"

Step 1: prove coin ownership <Org\_ID> Coin Issuer

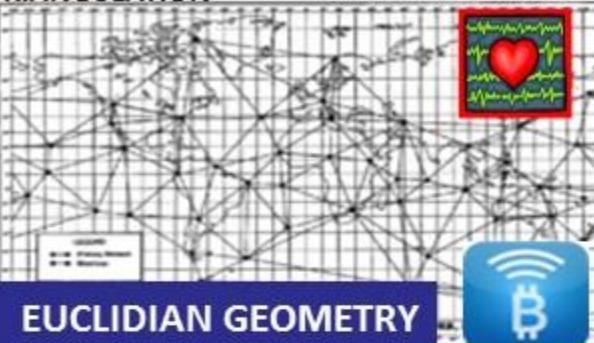
Step 2: coins sent where, when Lat-Long, Time Stamp

Step 3: specify ownership <Org\_ID> issuing agent

Step 4: Issuing Org of Record adjudicates w buyer



TRIANGULATION



EUCLIDIAN GEOMETRY



IDMaps assists Network Time Protocol (NTP) servers establish long term peering relationships



IDMaps / SonarHops collects distance data & builds virtual Internet distance maps & estimates distance between IP address pairs



IDMaps Distance Metrics: latency (round-trip delay) available bandwidth estimation

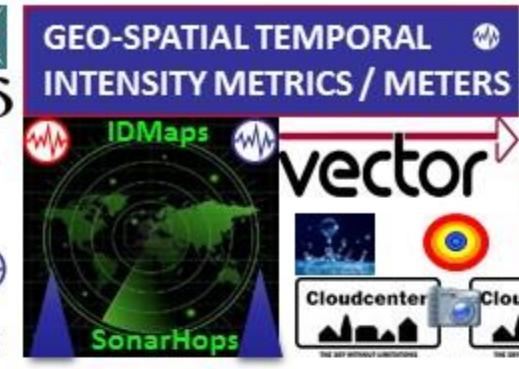
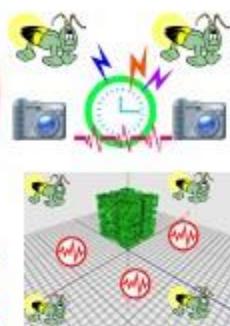




# IDMaps: Global Internet Host Distance Estimation Service



NDN: CONTENT ROUTING / <StratML> NDN INTEREST = Time / Distance



IDMaps scalable Internet-wide architecture measures, disseminates distance information



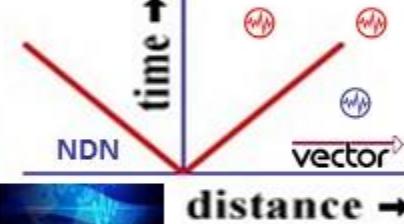
HOP COUNTS



REACHABILITY



/localhost/nfd/fib/add-nexthop



Higher-level services collect distance information to build a virtual distance map of Internet & estimates distance between any IP address pair

IDMaps provides distance information used by SONAR/HOPS query/reply service

Name Prefix  
<Org\_ID> Trie (NPT)



NDN NAMES

NDN NAMED DATA NETWORK RIB /  
FIB Datasets event notification

Distance information adjusts to "permanent" topology changes e.g., splits, joins, adds, moves, drops, merges in lieu of formal merger / acquisition

NDN RIB

NDN INTEREST LENGTH  
= DISTANCE BY HOPS

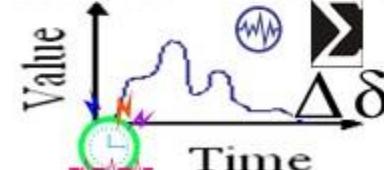
NDN  
INTEREST

IS DATA  
FRESH ?

TRIANGULATION



Time Series



Datasets and Event Notification

INTEREST in <URNs>

NDN STRATEGY CHOICE MANAGER – RIB Routing Information Base add-nexthop



IDMaps assists Network Time Protocol (NTP) servers establish long term peering relationships

Distance Metrics: latency (e.g., round-trip delay) and, where possible, bandwidth.



MICRO-CYCLES



NDN INTEREST LIFETIME = TTL Time To Live

HEARTBEAT STATE META DATASNAP SHOTS



# Electronic Product Code Information Services (EPCIS)

GS1 Standard for creating, sharing visibility event data



REGISTERED  
ORGANISATION  
VOCABULARY

Edge

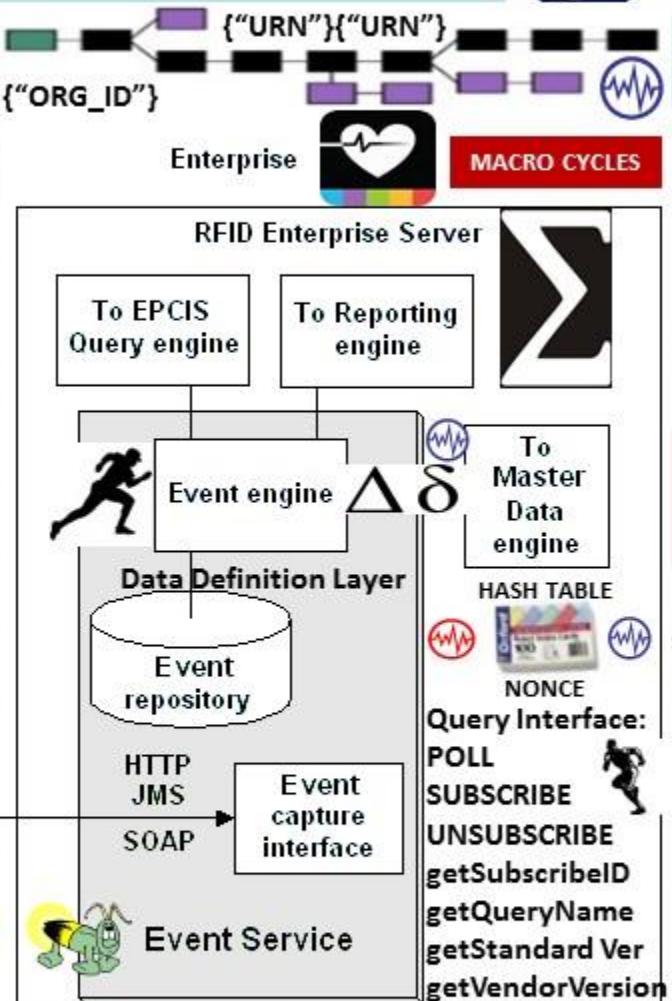
## EPCIS DATA MODEL



SERVICE LAYER

XML

- ObjectEvent
- AggregationEvent
- QuantityEvent
- TransactionEvent



## Core Business Vocabulary (CBV)

What identifiers of object(s) or entities / subject of the event

When date time when event took place, local time zone in effect

Where location identifier where event occurred, identifier of location where object(s) are expected to be following the event

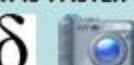
Why Information about the business context, including:  
a Identifier that indicates the business step taking place

MICRO CYCLES



CLOSER IS CHEAPER  
CLOSER IS FASTER

$\Delta\delta$



## TEMPLATES / FORMS

## ROLES / RULES ("FILTERS")

## NETOPS SOP

STRUCTURED DATA EXCHANGE /  
STRUCTURED MILITARY MESSAGES

BATTLEFIELD DIGITIZATION  
NETWORK CENTRIC WARFARE

SYSTEM OF SYSTEMS  
BEST PRACTICE

!st Compiler  
DESIGN  
Still the BEST

ROSETTA STONE

ALPHA NUMERIC  
BREVITY CODES

BIZ USE CASES

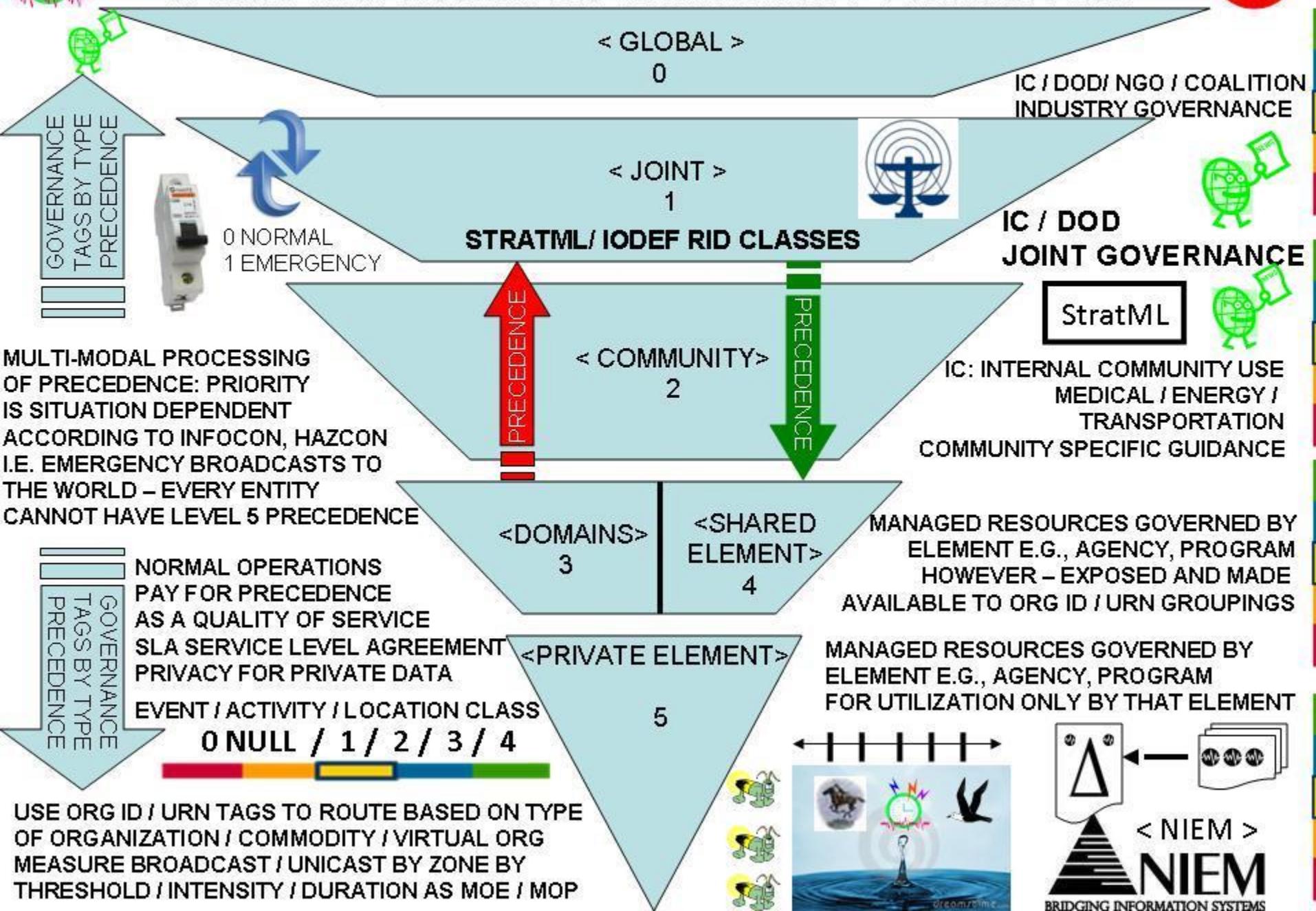
SYNTAX LEXICON CODE GUIDE

1st Compiler DESIGN Still the BEST

ROSETTA STONE



# ENABLE MAPPING OF GOVERNANCE / MANAGEMENT RESOURCES BY PRECEDENCE SHOWN IN GEO-SPATIO INTENSITY DASHBOARD VIEWS



# Situational Awareness Reference Architecture (SARA)

Identity, Inventory, Activity, and Sharing

<http://ics-isac.org/sara/>



ICS-ISAC



Industrial Control System  
Information Sharing and  
Analysis Center

**IDENTITY:** <UUID> = Devices, sensors  
Federation  
Gateway <ORG\_ID> Organizations

<ELEMENTS>

STRATEGIC  
MARKUP

StratML

LANGUAGE

STRATML / IODEF RID CLASSES:  
<GLOBAL><JOINT><SHARED>  
<DOMAIN><FEDERATION>  
<CITY><STATE><PRIVATE>

**INVENTORY:** Uniform Resource Name <URN>

<URN><URN>  
<URN><URN>  
<URN><URN>



vector

<COMMODITY><WATER><ENERGY><AVAILABLE UNITS>

GEO-SPATIAL TEMPORAL INTENSITY METRICS

UNIFIED EVENT / ALERT TRIGGER / THRESHOLDS

GEO-SPATIAL TEMPORAL  
INTENSITY METRICS / METERS



**ACTIVITY:** <EVENT><ALERT> <TIME\_STAMP><ORG\_ID><URN>

CONTENT LEXICON  
ROSETTA STONE

NDN

<GEO\_LOC\_GPS><STATUS>



<Halt><Moving><Stale><Ready>

**SHARING:**

COMMON <TAGS>  
<Organizational\_ID>  
Resource Names <URN>  
<Time\_Stamps>  
<State-Meta\_Data  
<DATA\_CLASS\_TYPE>  
<Heartbeat\_snapshots>



AVALANCHE

WELCOME TO THE FS-ISAC SECURITY AUTOMATION GROUP. OUR VISION IS  
A FEDERATED NETWORK OF STIX-BASED REPOSITORIES SHARING INTELLIGENCE IN  
REAL-TIME. AVALANCHE: STRENGTH IN NUMBERS, SECURELY SHARE INTELLIGENCE

NIST CYBER SECURITY FRAMEWORK

CYBER SECURITY CONTENT  
LEXICON ROSETTA STONE

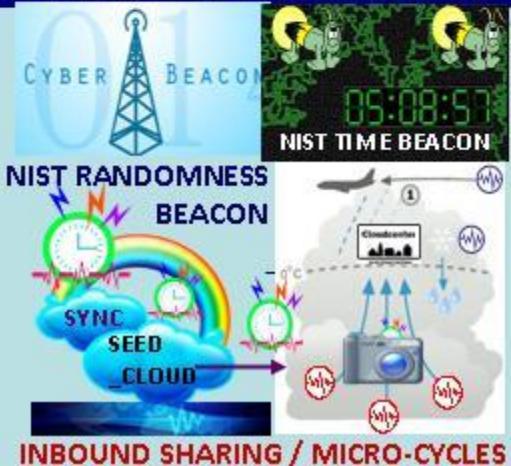
MIL-STD 2525A
STRUCTURED <CONTENT> TEMPLATES

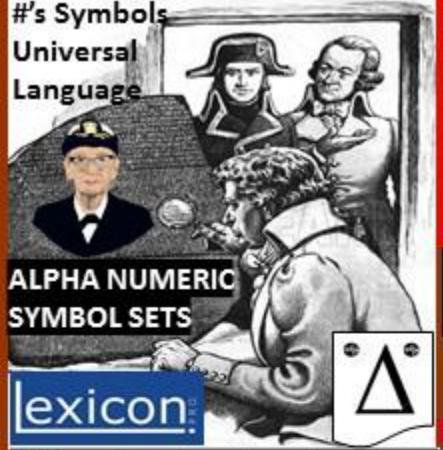


NAMED DATA  
NETWORKING  
<Content> Centric

USMTF / XML MTF FORMATTED MESSAGE CATALOG  
Catalog has over 300 messages to choose from have a  
wide number of information exchange requirements  
using common, CONSENSUS Message Text Formats  
MTFs. MTFs specify <CONTENT> / information agreed  
by group consensus presenting information in a logically  
well specified and unambiguous layout i.e., templates

<TAG>  
LIBRARY





ALPHA NUMERIC SYMBOL SETS

lexicon.



FROM	TO	STRUCTURED SCCONTENT>	APERTURE	MCB
ASAN		EXCHANGE		
ABODPS		TEMPLATES		
APATOR				
		MIL-STD 2525ABC		
		Universal Parser		
		BINARY XML	<>	
		TOSCA YAML	XML	

11.8 - Kinematic	STRATML	XAML
11.8.1 -		
11.8.1.1 -		
11.8.1.		
<b>XBRL</b> THE BUSINESS REPORTING STANDARD		
1.1 - General Data		
1.2.3 - Predicted		
1.2.4 - Smoothed Data		
- Position		
1.3.1 - Bearing Angle		
1.3.2 - Location; 2D Hor		
1.3.3 - Vertical		
- Velocity		
1.4.1 -		
1.4.2 -		
VA Cor		
- Beat		
2 - Bea		
3 - Cov		
	DDL DATA DEFINITION LANGUAGE	json

Signal operating instructions (SOI): technical control coordination of signaling, telemetry Current situational awareness, data dictionary, network identification, channels, network directory, brevity code-words, signals. Units maintain 2 SOI copies: PEACE TIME version "Go-To-War" version = BIZ COA (s) <Org\_ID1><Org\_ID2><Org\_ID3>



NATO MESSAGE TEMPLATES USE DATA SETS FOR STRUCTURED DATA EXCHANGE // POSITION FIELD IN MESSAGE PROCESSED BY TABLE, FIELD # IN A CONSISTENT, PREDICTABLE ORDER = AI FRIENDLY M2M AI

GOAL: vide a common lexicon / syntax / term library used among FEDERATIONS identified by Federated ID  
GOAL: Provide a common, consistent, reliable schedule to share signaling and telemetry within federations.

MESSAGE TEXT FORMAT : {"URN":"URN"} {"TRANSACTION\_ID"} {"ORG\_ID"}

SEG RPT OCC CLASSNAME SETID SEQ FIELD OCCURRENCE SET FORMAT NAME

O 11NUPRES EXER 1 /M /O // (NU) EXERCISE IDENTIFICATION

C 11NUPRES OPER 2 /M /O /O /O // (NU) OPERATION CODEWORD

M MIOPV1 1 MSGID 3 /M /M /O /O /O /O // (NU) MESSAGE IDENTIFIER

M MIP OUT ORDPLAN 4 /M /O /O /O // (NU) PLAN ORDER REFERENCE

O MIPOUT MSGREF 5 /M /M /M // (NU) REFERENCED MESSAGE

O 11NUPRES DTG 6 /M // (NU) DATE-TIME GROUP

1 /M /M /M /M /C // (NU) ORGANIZATION DESIGNATOR

1 /M // (NU) 1.A ENEMY FORCES / COMPETITORS

1 /M // (NU) 1.B FRIENDLY FORCES / TRADE FEDERATION

1 /M / (NU) 1.C ATTACHMENT / DETACHMENT

1 /M / (NU) 1.D COMMANDERS EVALUATION



SYMBOLS Friend Neutral Hostile VIRONMENTAL INFORMATION

SIOP PICTURE Partner STATUS Competitor SION K00.99 / FIX / SWIFT / E-911 Heartbeat Message

O 11NUPRES GENTEXT 14 /M /M // (NU) 3.A CONCEPT OF OPERATION

O 11NUPRES GENTEXT 17 /M /M // (NU) 3(3) RECONNAISSANCE SURVEILLANCE

O 11NUPRES GENTEXT 21 /M /M // (NU) 5(5) INFORMATION OPERATIONS

O 11NUPRES GENTEXT 28 /M /M // (NU) 5(5) COMMS INFORMATION SYSTEMS

O 11NUPRES GENTEXT 35 /M /M // (NU) 3.D COORDINATING INSTRUCTIONS

M 11NUPRES GENTEXT 36 /M /M // (NU) 4.A SUPPORT CONCEPT (BIZ PLAN)

M 11NUPRES GENTEXT 37 /M /M // (NU) 4.B MATERIEL AND SERVICES

M 11NUPRES GENTEXT 38 /M /M // (NU) 4.C MEDICAL EVAC & HOSPITALISATION

O 11NUPRES GENTEXT 40 /M /M // (NU) 4.E CIVIL - MILITARY OPERATIONS

NUMBERS ARE THE UNIVERSAL LANGUAGE / Symbols Rule the World"

INDEX REFERENCE #: M015 STATUS:

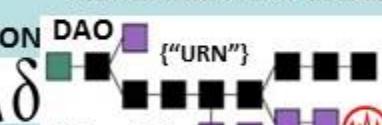
EFFECTIVE: 14-DEC-99 PURCHASE CODES

FEDERATED PEGS

{"ASSET\_CLASS"}  
{"ASSET\_TYPES"}

ISO 10383 - MIC

Market Identifier Codes



K00.99 / FIX / SWIFT / E-911 Heartbeat Message

NDN NAMED DATA NETWORKING PRECEDENCE PROCESSING

SEQUENCE for RULES ROLES LOGIC FILTERS



FROM	GCCS-A	ALPHA-NUMERIC BREVITY CODES																																																																																									
 <b>FEDERATE</b> 		<p><b>USMTF / XML MTF FORMATTED MESSAGE CATALOG = 300 + messages info exchange sets using common, CONSENSUS Message Text Formats MTFs.</b> MTFs specify &lt;CONTENT&gt; / info agreed by group consensus presenting information in a logical, well specified unambiguous layout resulting in a highly efficient info payload to overhead ratio <b>M2M</b></p>																																																																																									
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<b>Information Categories and Examples</b>																																																																																											
Object Categories	Examples	Location	Movement	Identify	Status	Activity	Intent																																																																																				
OOB	<b>SYNTAX LEXICON</b>	lat/long	spd/hdg	country / alliance, type/class	readiness	targeting, reconning	{"Java JS"}																																																																																				
Infrastructure	Comm, power, transportation, water/sewer	network, grid	throughput, flow rates,	name, part-of relationships	BDA, op levels	repair, broadcasts	YAML expansion plans																																																																																				
Sociological	Culture, religion, economic, ethnic, government, history, languages																																																																																										
Geophysical	Terrain, weather, climatology, oceanography, astrometry	feature	lat/long, alt/dpth																																																																																								
<table border="1"> <thead> <tr> <th>ER Model</th> <th>Class Diagram</th> <th>Relational Database</th> <th>Object DBMS</th> <th>XML DTD / Schema</th> <th>TADILs</th> <th>MTF</th> </tr> </thead> <tbody> <tr> <td>Entity</td> <td>Class</td> <td>Table</td> <td>Class</td> <td>Element</td> <td>Message</td> <td>Message</td> </tr> <tr> <td>Attribute</td> <td>Attribute</td> <td>Field / Column</td> <td>Attribute</td> <td>Child Element or Element Attribute</td> <td>DFT</td> <td>FFIRN / FFN / FUDN</td> </tr> <tr> <td>Domain Value</td> <td></td> <td>Instance, Value</td> <td></td> <td></td> <td>DUI</td> <td>FUD</td> </tr> </tbody> </table>								ER Model	Class Diagram	Relational Database	Object DBMS	XML DTD / Schema	TADILs	MTF	Entity	Class	Table	Class	Element	Message	Message	Attribute	Attribute	Field / Column	Attribute	Child Element or Element Attribute	DFT	FFIRN / FFN / FUDN	Domain Value		Instance, Value			DUI	FUD																																																								
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<b>Information Elements Roles</b> <ul style="list-style-type: none"> <li>COI Determination Org Interaction</li> <li>Search and Discovery</li> <li>Ontologies STANDARDS</li> <li>Taxonomies REFERENCE</li> <li>Metadata Attributes / Filters ("Org_ID") {"URN"}</li> </ul>																																																																																											
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<b>FFIRN Field Format Index Reference #</b>																																																																																											
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		<b>"SYMBOLS</b> <b>RULE THE</b> <b>WORLD"</b>			11.8 - Kinematics 11.8.1 - Pos / Vel / Acc (PVA) 11.8.1.1 - Acceleration 11.8.1.1.1 - Angular 1.1.2 - Linear 2 - Estimate Type 1.2.1 - Estimated 1.2.2 - Observed 1.2.3 - Predicted 1.2.4 - Smoothed Data																																																																																						
<b>PURCHASE</b> <b>CODES</b>																																																																																											
<b>SYMBOL</b>		<b>Friend</b>		<b>Neutral</b>		<b>Hostile</b>																																																																																					
<b>2525C</b>		<b>Partner</b>				<b>Competitor</b>																																																																																					
 4 - Velocity																																																																																											
 1.4.1 - Horizontal																																																																																											
 1.4.2 - Vertical																																																																																											
 VA Confidence																																																																																											
 1 - Bearing Angle																																																																																											
 2 - Bearing Angle Rate																																																																																											
 3 - Covariance Matrix																																																																																											

# Heart Beacon Cycle

TRADE FEDERATION Bitcoin Blockchain



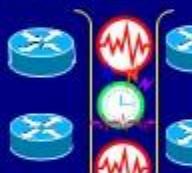
1. **FEDERATION:** Latin: *foedus, foederis, covenant, union* of partially self-governing states or regions under a central (federal) government
2. A league or confederacy. Individuals / groups retain **AUTONOMY**
3. A federated body formed by a number of nations, states, unions each retaining control of internal affairs

Net joins, drops, splits, merges, moves



Office 365 Groups

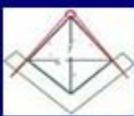
Agile, adhoc NETOPS Vs acquisition preserves the **CHANNEL**



**Bitcoin Group Signatures Dynamic Membership Multi-party Signature DMMS:**  
independent interest within group signatures – **FEDERATED ID** {"Org\_ID"}



Bitcoin Mining Pools  
MEME / METAPHOR MEDIATION



Federation  
Gateway

**TERM DISTRIBUTED AUTONOMOUS ORGANIZATION DAO** first used by RAND Corp  
Circa 1991 now in use by Blockchain tech corporations..



FIREFLY FLASH  
HEARTBEAT MESSAGES



iET DEVICE / PLATFORM  
IoT SENSOR DEVICE

{"Asset\_Type"}

Uniform\_Resource\_Name  
</RESOURCE> {"URN"}  
{"Asset\_Class"} </URN>

PURCHASE CODE



FEDERATED ID  
Org Unit OU, OU, OU

{"GLOBAL"}  
{"SHARED"}  
{"DOMAIN"}  
{"COMMUNITY"}  
{"PRIVATE"}



UUID  
123e4567-e89b-12d3-a456-426655440000  
123e4567-e89b-12d3-a456-426655440001  
123e4567-e89b-12d3-a456-426655440002

STOCK EXCHANGE  
MIC MARKET IDENTIFIER  
CODES / BREVITY CODES

{"DUNS #"}  
{"Org\_ID"}



Heartbeat Snaps  
MICRO-CYCLES

Signaling, Telemetry



# NAMED DATA NETWORKING

<CONTENT> CENTRIC NETWORKING



<ORG\_ID>  
<ORG\_ID>  
<ORG\_ID>  
<URN>  
<URN>

<GLOBAL> <JOINT> <COMMUNITY> <DOMAINS> <SHARED> <PRIVATE>  
</INTEREST> <STRAT\_ML> <IODEF\_RID> </DISTANCE>

## Situational Awareness Reference Architecture (SARA) IDENTITY, Inventory, Activity, and Sharing

<Federated ID> <URN> <type\_event> <Data Class Types>

STRUCTURED MILITARY MESSAGING FORMS: FIELD TYPES, FILTERS, TAGS

PARSED, PROCESSED, COMPILED TELEMETRY SIGNALING STANDARDIZATION

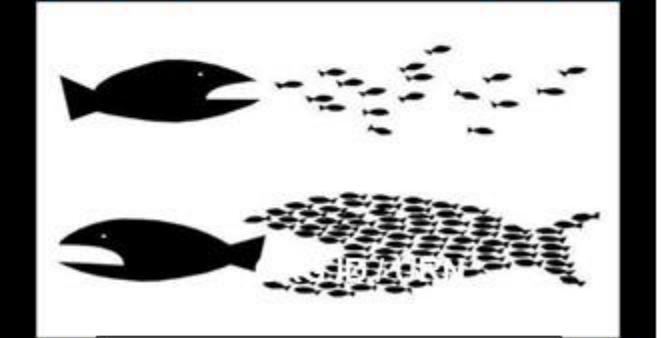
USMTF / XML MTF FORMATTED MESSAGE CATALOG

Catalog has over 300 messages to choose from have a wide number of information exchange requirements using common, CONSENSUS Message Text Formats MTFs. MTFs specify <CONTENT> / information agreed by group consensus presenting information in a logical, well specified and unambiguous layout resulting in a highly efficient information payload to overhead ratio

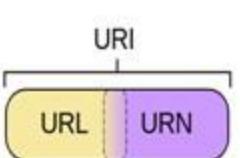
</Organizational\_Identifier\_Org\_ID>

Organizational Units OU, OU, OU

Don't Panic



FEDERATE



ARIN  
American Registry for Internet Numbers

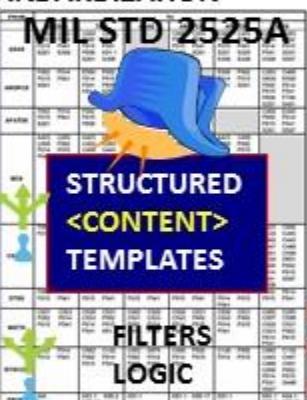
**Uniform Resource Names (URNs):** A Uniform Resource Identifier (URI). Both URNs (names) and URLs (locators) are URIs, and a particular URI may be a name & locator. Each plays a specific role:

- URNs IDENTIFICATION (SENSORS, DEVICES) <DATA CLASS TYPES>
- URCs INCLUDE META-INFO
- URLs LOCATE / FIND RESOURCES



SITUATION AWARENESS

NEWSCAST



DISTANCE ESTIMATE SERVICE

IDMaps  
SonarHOPS

K00.99  
Heartbeat Message

SURVEY METHOD  
ID <ITEMS><INTEREST>  
GEO-SPATIAL AREA  
TEMPORAL INTENSITY  
MEASURES / METRICS

BY <TAG\_TYPES>  
Ledgers  
Contracts  
Trade SLA  
Agreements



TRIANGULATION  
TELCO MESH FABRIC

vector

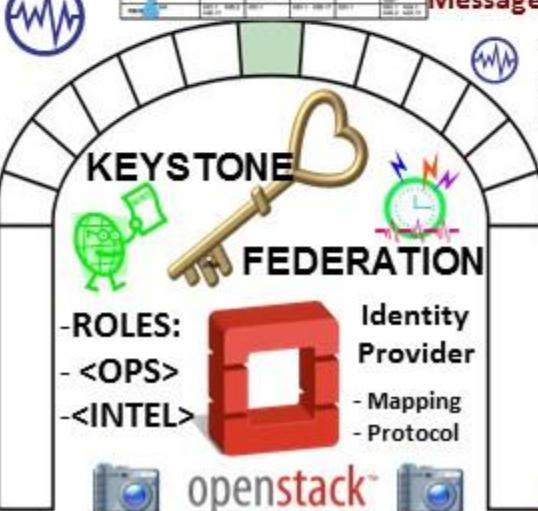
CROWD SOURCING / FUNDING



<Org\_ID>  
<Org\_ID>  
<Org\_ID>  
<Party>  
<Party>  
<Party>  
<URN>  
<URN>  
<URN>  
<URN>

PARTIDO X:  
Distributed  
Democratic  
Participation

ETHEREUM:  
Decentralized  
Autonomous  
Organizations



Identity Provider  
- Mapping  
- Protocol



VOTE ON BLOCKCHAIN

PARTIDOS DEL FUTURO

FEDERATED ID





# OpenBazaar open source decentralized peer to peer network online commerce —using Bitcoin —no fees and no restrictions



- Creates an online store for users to sell goods for Bitcoin
- Connects these stores directly to each other on a global network
- Users browse individual stores, search for products across whole network
- A buyer directly connects, purchases good from the merchant using Bitcoin
- Bitcoin payments via escrow protect merchants & buyers during trade

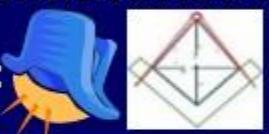
OPENBAZAAR.ORG  
BLOCKCHAIN ARBITRAGE



OpenBazaar is a different approach to online commerce. OpenBazaar connects buyers and sellers directly. Because there is no one in the middle of your transactions there are no fees, no restrictions, no accounts to create, and you only reveal personal information you choose.

## PROJECT PHILOSOPHY: *MAKE TRADE FREE*

**Mission:** *shift trade to a decentralized platform*



Demurrage Fees TERRATRC TRADE  
REFERENCE CURRENCY  
"Money of Peace"  
Commodity / Currency Index



**Free and open markets:**

Creating open, competitive markets for services that cannot be perfectly solved with technology

### •VALUES:



HASH Values  
Nonce Values

SCT Alice V Cls Bank



### •Privacy

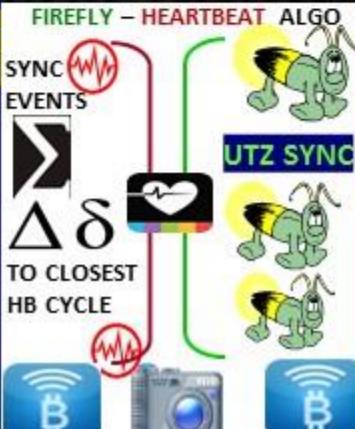
- Users should fully control their data. **Users** have freedom to reveal as much personal identifiable information as they want, when they want

**Bitcoin:** OpenBazaar transactional currency



### Cryptographic Security

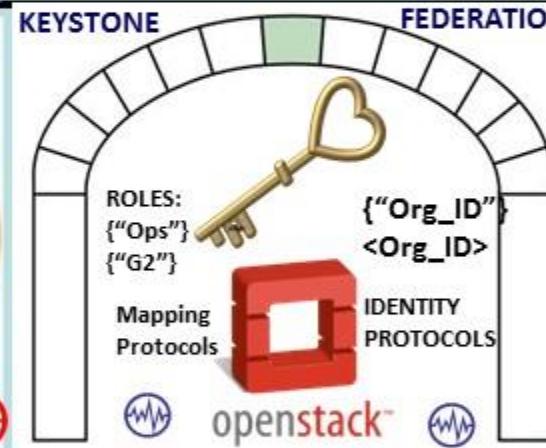
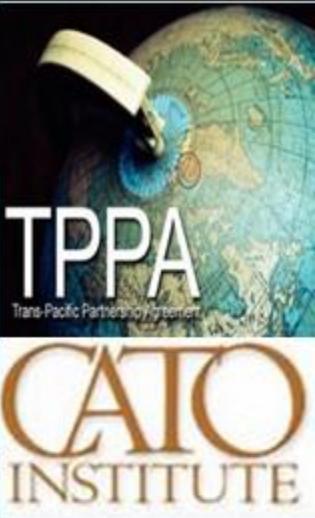
- tamper-proof agreements
- 1) minimize potential disputes
- 2) fast-track dispute resolution





Trans-Pacific Partnership is great for elites. Is it good for anyone else? by [Timothy B. Lee](#) on April 17, 2015

How the TPP empowers elites. The nature of trade agreements has shifted. They're no longer just about removing barriers to trade. They've become a mechanism for setting global economic rules more generally. This system for setting global rules has some serious defects. We expect the laws that govern our economic lives will be made in a transparent, representative, and accountable fashion. The TPP negotiation process is none of these — it's secretive, it's dominated by powerful insiders, and it provides little opportunity for public input. Attributed to CATO Institute



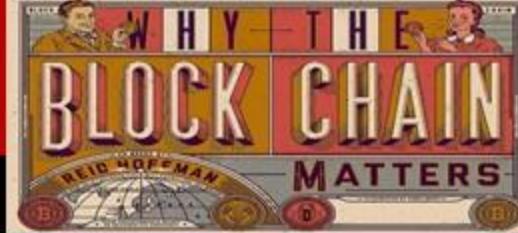
HEART BEACON CYCLE: ALL THINGS INTERNET ARE PROGRAMMED USING TIME CYCLES USED / NOT USED TO PROCESS / NOT PROCESS SYNTAX



# TradeNet



Programmable Money \$\$\$



RIED HOFFMAN 15 May 2015 [LINK](#)

"The CODE that secures Bitcoin could also power an alternate Internet [LINK](#)



300 + MESSAGE TEMPLATES
SYNTAX LIBRARY
PROGRAMMING
STRUCTURED <CONTENT> EXCHANGE
BREVITY CODES
MARKET ID CODES

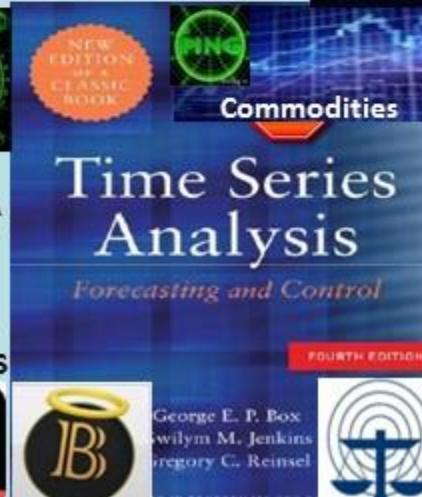
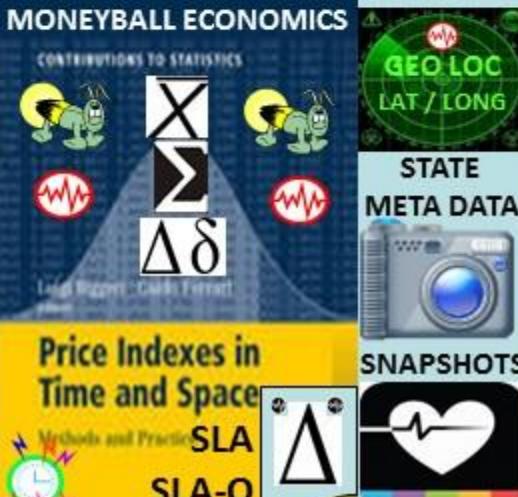


Bitcoin and the blockchain function as a medium of exchange, a store of value, a unit of account. Bitcoin adds digital, cryptographic, distributed server functions to currencies. Because it functions simultaneously as a currency, an asset and a platform, Bitcoin is better described as a global cryptoCAP (currency, asset, platform) -- a synergistic form of "cryptocapital" to unleash the full economic power of the networked age. **Bitcoin makes money PROGRAMMABLE. MONEY IS SIMPLY DATA** - a simple way to measure and keep track of exchanges in value wealth accumulation. Bitcoin aggregates data in a distributed global ledger accessible to anyone, and software. First open platform for financial services. Color coins represent stocks, bonds, currencies, properties as E-assets.

WIRE

[http://en.wikipedia.org/wiki/Organizational\\_unit\\_\(computing\)](http://en.wikipedia.org/wiki/Organizational_unit_(computing))

In computing, an organizational unit (OU) is a way of classifying directories objects, or names in a DIGITAL CERTIFICATE HIERARCHY





Decentralized Trading Platform DAO ORACLE access conventional, legacy financial data to price, value, trade & settle OTC, P2P financials

Zero Trust Transaction: money performs according to terms agreed to by the parties. Ex: purchase of widget from retail store where widget must be delivered to person B on **TIME X**, in **Y condition** at **PLACE Z** or person A does not get paid. Global stock, currency, commodities exchanges, letters of credit, insurance underwriting, trading, intellectual property...

**Cost will be our stated rates that will fluctuate with VeUSD exchange rate. Veritas holders get priority. The ability to redeem Ve against USD gives our clients instant value.**



**VERITAS TOKENS = KEYS TO P2P Capital Market!** Proprietary P2P smart contracts combined with the transformational power of blockchain, allow the entire world to participate in the reimagining of global capital markets.

Purchasing Veritas tokens is analogous to purchasing keys to the internet of money – the most monumental paradigm shift since the advent of the net

Place Order	
Principal:	\$100.00
Collateral:	0%
Leverage:	10x
Notional Amount:	\$1000.00
Receive:	QCOM
Pay:	INTC
Denominating Asset:	~BTC:SATOSHIS
Contract Expiry:	16w
Contract Starts at:	-
Contract Ends at:	-
Cancel Contract at:	-
Est. Trans. Fees:	\$0.0437
Transaction Fees:	\$1.0262
Leverage Fees:	\$3.2528
Max. Profit/Loss:	+ \$95.6773 / - \$104.3227
Total Required:	\$104.3227

ritaseum™ FIREFLY HEARTBEAT ALGO EVENT BUS

DAO Distributed Autonomous Organization SOFTWARE POOLS

All Market Orders Search

UTZ TIME SYNC Collateral Notional Expiry

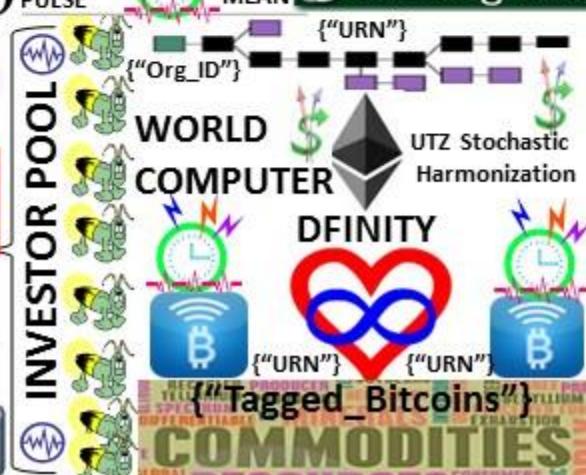
Heartbeat Flash Messages Precedence Processing

As long as INTC decline outpaces QCOM, you get paid. QCOM can be replaced with GOOG, or even AAPL although I feel AAPL will have its issues in the upcoming quarters as well.

INVESTOR POOL WORLD COMPUTER DFINITY

UTZ Stochastic Harmonization

FINANCIAL  
NOSTRADAMUS  
REGGIE MIDDLETON



**NIST RANDOMNESS BEACON:** broadcast full-entropy bit-strings in blocks of 512 bits every 60 seconds. Each value is time-stamped, signed, & includes hash of previous value to chain sequence of values together. This prevents all, even the source, from retroactively changing an output packet without being detected. The beacon keeps all output packets and makes them available online. 1st, Beacon-generated numbers cannot be predicted before they are published. 2nd, public, Beacon's time-bound, authenticated nature of the Beacon proves true random numbers not known before a certain point in time. 3rd, this proof can be presented offline at any point in the future

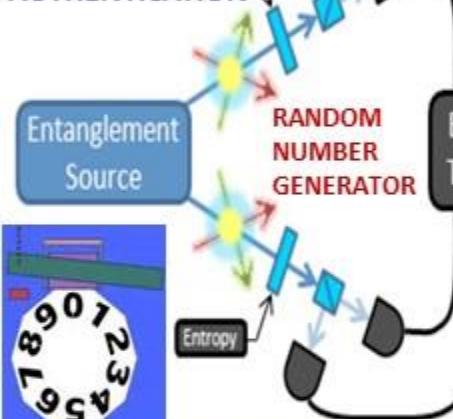


## NIST QUANTUM ENCRYPTION RANDOMIZATION BEACON

UNPREDICTABLE SAMPLING



SECURE AUTHENTICATION  
SECURE MULTI  
PARTY /  
AUTENTICATION



USPTO 13,573,002 Heart Beacon Cycle Geo-spatial, temporal Intensity

Metrics and Time - Space Meter uses PHYSICAL Memes / Metaphors



NDN  
</Interest>  
</Distance>

SURVEY METHODS  
+ TRIANGULATION  
Euclidian Geometry

Geodesic System Routing Info Base RIB

ACCOUNT BELONGS TO </Org\_ID>

RESOURCE TYPE: <URN><URN><URN>

DEVICE / SENSORS <UUID><UUID>

OFFSHORE BEACONS ONSHORE  
Higher-level services collect distance data to build virtual distance map State of Internet & estimates distance between any IP address pair



NDN  
</interest></distance>

The current standard time common throughout the world is based on a 24-hour clock, with zones that are either 12 hours ahead or behind Coordinated Universal Time (UTC). However, these time zones are decided upon by individual governments, without overall coordination and can even extend fourteen hours ahead UTC.

Stochastic Harmonization



The proposed Universal Timezone System would do away with all these different time zones and instead use a single global time zone called UTC.



A decentralized exchange called BitSquare has launched a campaign on the decentralized crowd funding app [Lighthouse](#). Its campaign is simultaneously an example of how powerful decentralized crowd funding is, and how difficult running a successful campaign is... segue to the MESH ECONOMY

The current standard time common throughout the world is based on a 24-hour clock, with zones that are either 12 hours ahead or behind **Coordinated Universal Time (UTC)**. However, these time zones are decided upon by individual governments, without overall coordination and can even extend fourteen hours ahead UTC.





- SDN is a *framework* to allow network administrators to *automatically* and dynamically manage and control a *large number* of network devices, *services*, topology, traffic paths, and packet handling (quality of

**DevOps model** and tools to enable scale, programmable agility, and policy-driven automation, and provides network virtualization to mask network configuration complexity with set of networking APIs



## Autonomous Device Coordination Framework



Registration

Authentication

Proximity based rules

Consensus based rules

FEDERATION AGREEMENTS

PROCEDURAL TEMPLATE

Contracts

Checklists

## FEDERATION

&lt;UUID&gt;&lt;ORG\_ID&gt;&lt;URN&gt;

## LDAP DIRECTORY

Physical proximity

Social proximity

Temporal proximity

Agreements

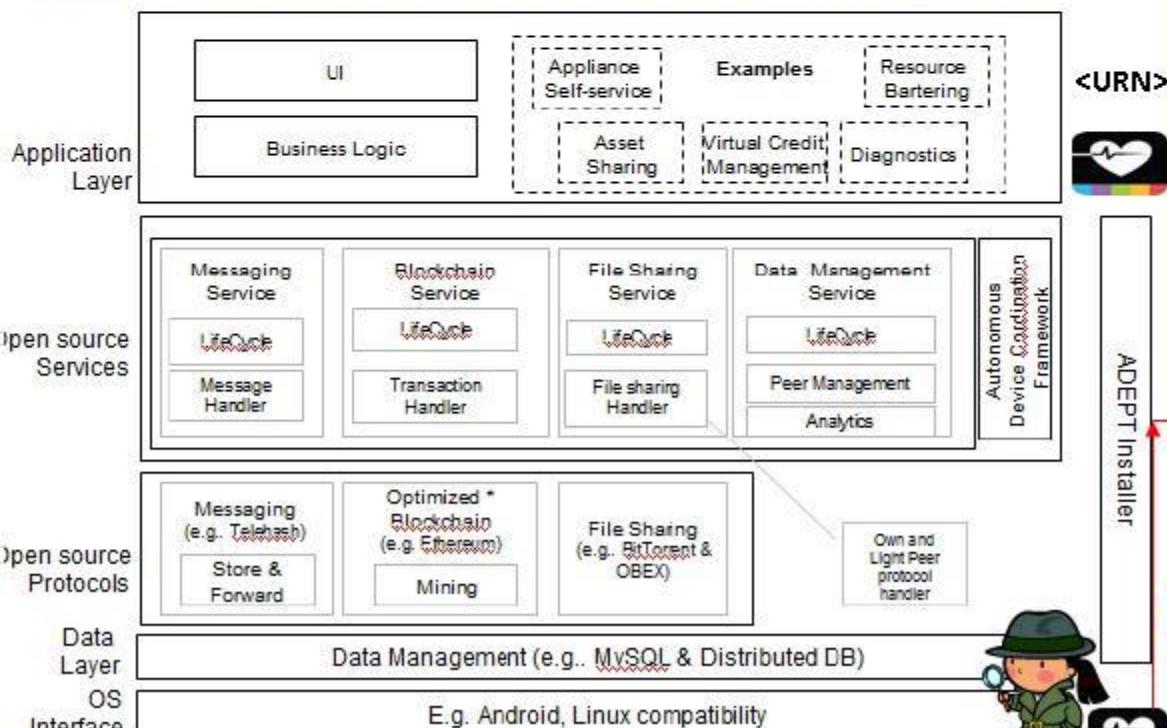
Payments

Barter



PAYMENTS BASED ON GEO-SPATIAL TEMPORAL METRICS / METERS  
<URN> DESCRIBES COMMODITIES ETC BY UNIFORM RESOURCE NAME BY </INTEREST>

## ADEPT Standard Peer Architecture – Logical View



\* Could be optimized to hold the complete blockchain. Function of ADEPT Installer



ASSET SHARING WITHIN FEDERATION

BUSINESS LOGIC = WORKFLOW &lt;XML\_Wf&gt;

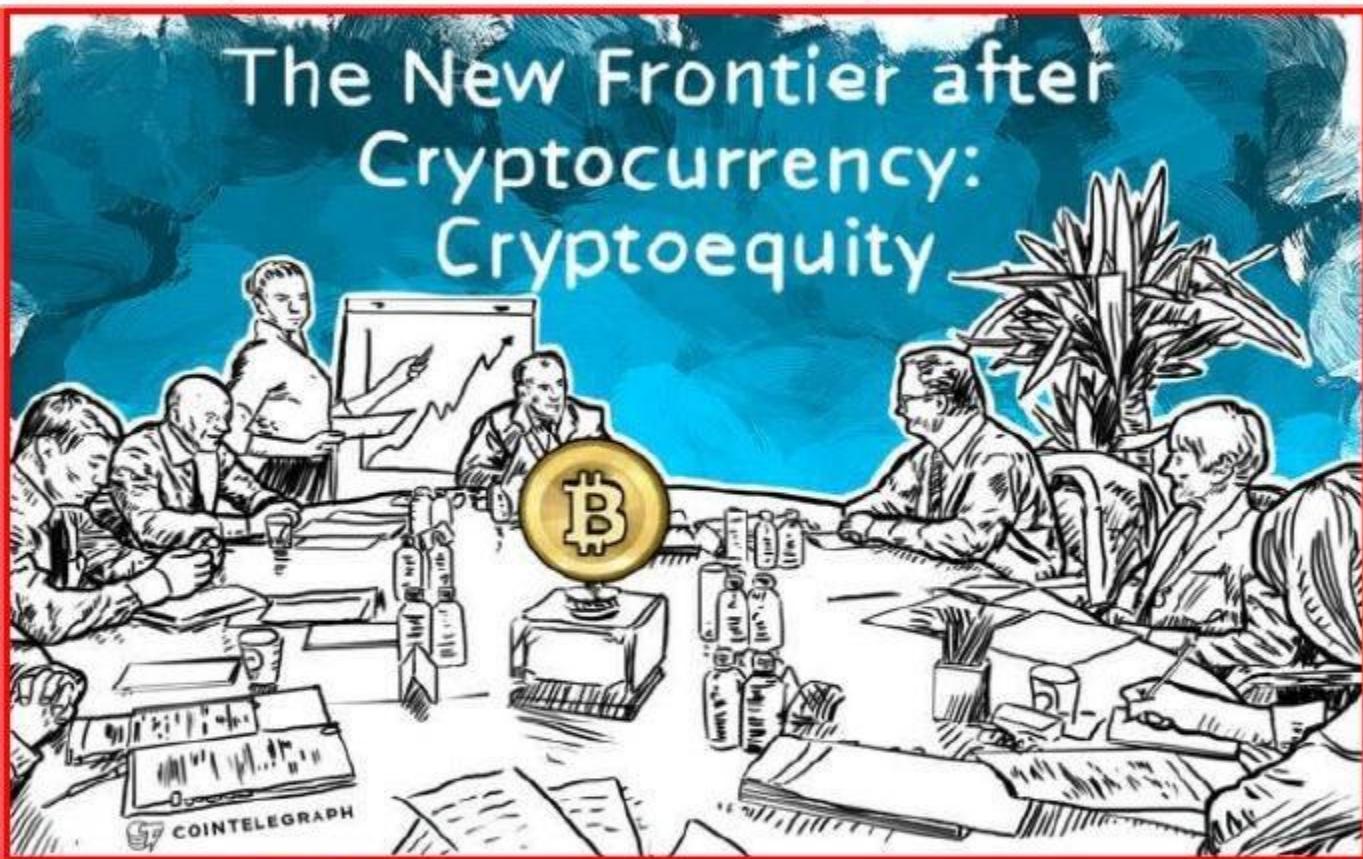
FILE SHARING = CYCLIC SYNC DELTA LEDGER / DOCUMENT REFRESH



OPEN SOURCE = HBC = PROTOCOL AGNOSTIC

DATA LAYER: STATE META DATA TIME STAMPED BY <UUID><ORG\_ID><URN> & DATA PREPPED & "DATA WRANGLER PRIOR TO FUSION CENTER ENHANCED ANALYTICS / PROTECTS BANDWIDTH

DAO: Distributed Autonomous Organization. RAND Corporation first used in a military context in 2000 [http://rand.org/pubs/documents\\_briefings/DB311.html](http://rand.org/pubs/documents_briefings/DB311.html)  
[Swarming and the Future of Conflict | RAND www.rand.org](#)



## SWARMING ON THE BATTLEFIELD

*Past, Present, and Future*

SUS J. A. EDWARDS

RAND  
Monograph  
Report

## THE ADVENT Of NETWAR

Eris -- The Dawn of Distributed Autonomous Organizations and The Future of Governance



<http://cointelegraph.com/news/112077/the-new-frontier-after-cryptocurrency-cryptoequity>



Ethereum: use of DAO in crypto coin sphere  
BitShares.org too ☺

<https://twitter.com/TheBitcoinArmy>



ERIS: GODDESS OF DISCORD  
DISRUPTIVE TECHNOLOGIES:

- BITCOIN ETHEREUM
- BITCOIN STELLAR
- BITCOIN NAMECOIN
- BITCOIN RIPPLE



<http://hplusmagazine.com/2014/06/17/eris-the-dawn-of-distributed-autonomous-organizations-and-the-future-of-governance/>

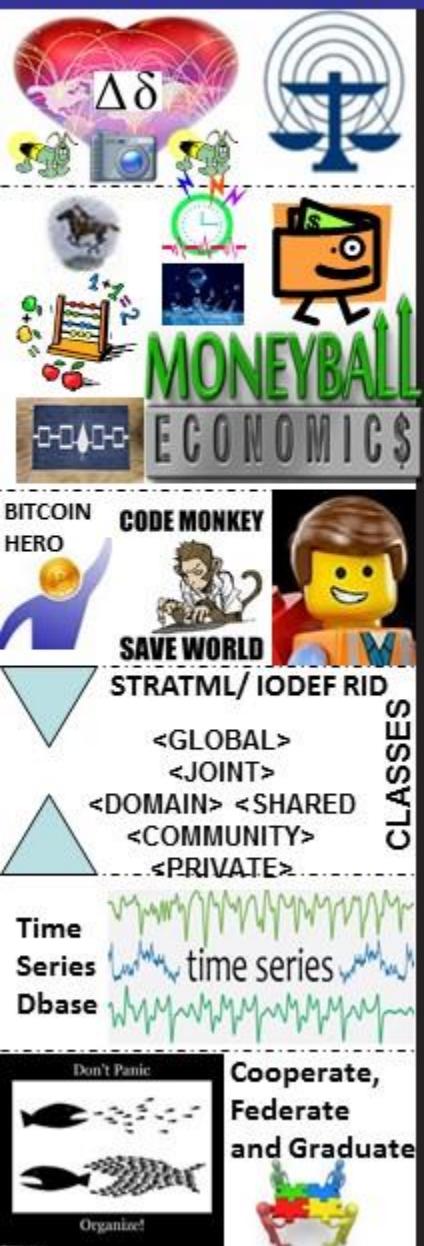
# How 'Bitbanks' Could Solve Bitcoin's Volatility Problem

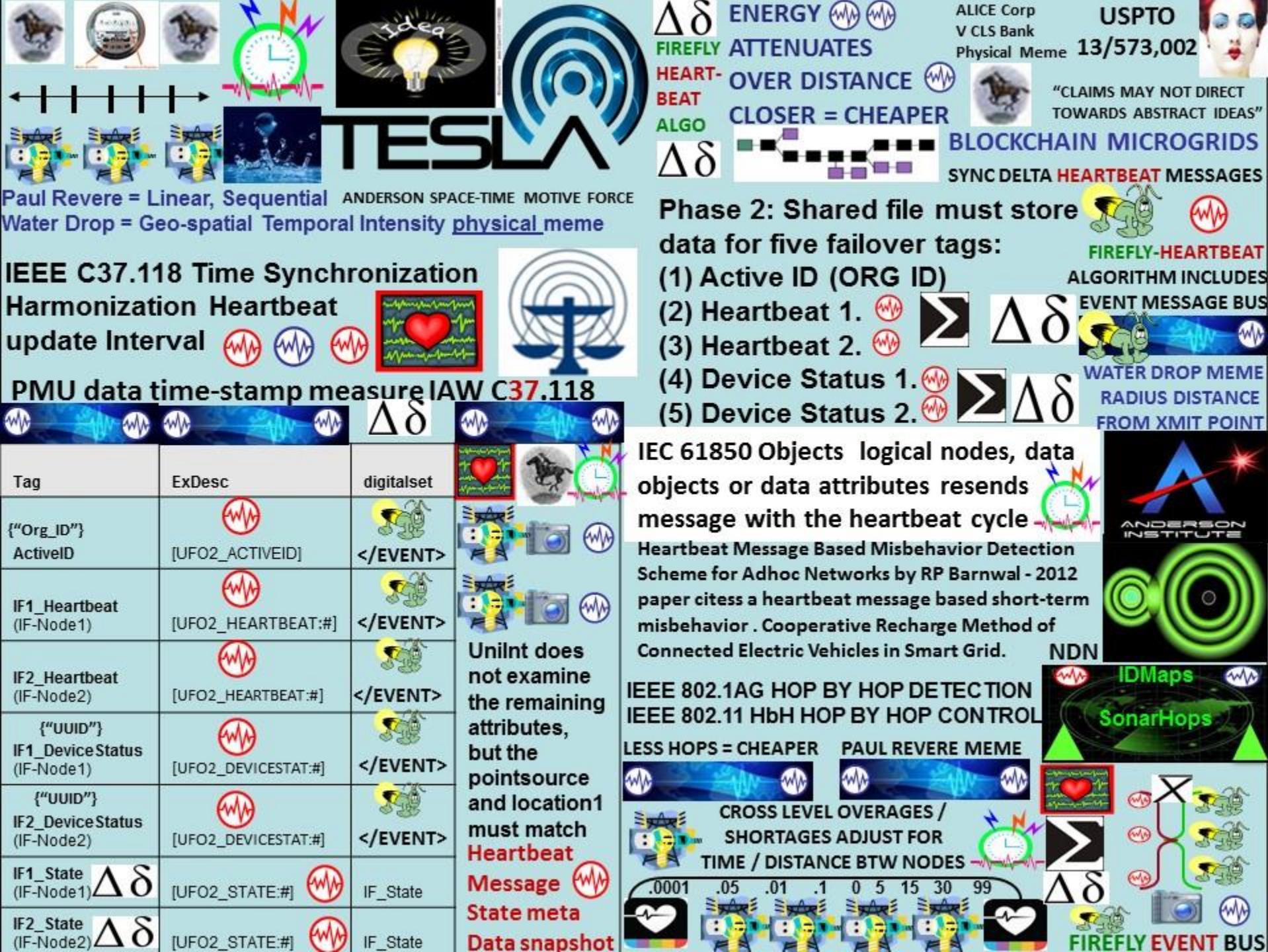
$$MV=PQ \text{ Money} \times \text{Velocity} = \text{Price} \times \text{Quantity}$$

The most important equation in monetary economics, the equation of exchange:  $MV=PQ$ . The quantity of money (M) times the rate spent (V for velocity) equals the price of everything bought (P) times the amount bought (Q for quantity). In Bitcoin, M Money is on a predetermined path, converging to 21m bitcoins. In relation to the other variables, Bitcoin is fixed. V, P, & Q fluctuate



**Gamification** is the use of game thinking and game mechanics in non-game contexts to engage users in solving problems. Gamification techniques strive to leverage people's natural desires for competition, achievement, status, self-expression, altruism, closure.





# 13/573,002 HEART BEACON CYCLE

## The four dimensions of Big Data

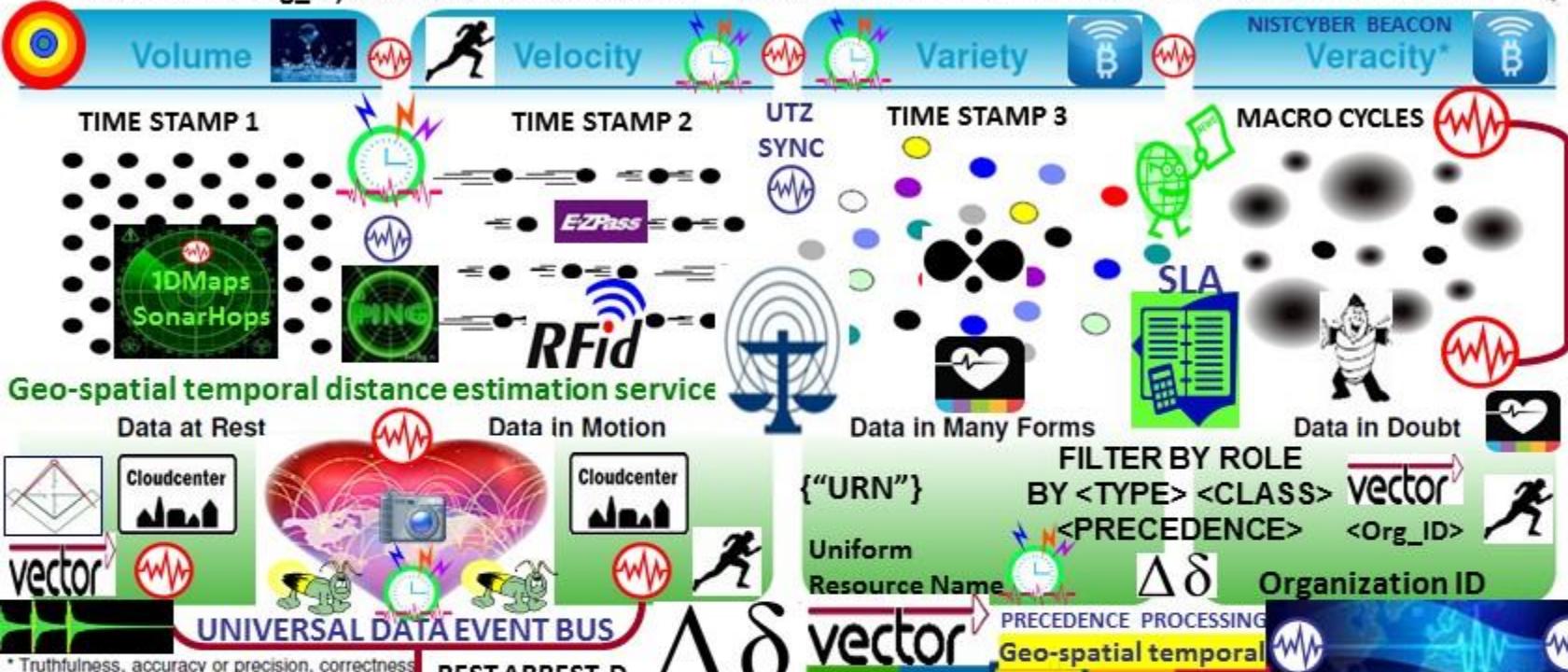
TIME STAMP BY Org\_ID, URN Before FUSION CENTER

Time -Space meter, metrics / Universal data event, alert bus  
Internet of Everything IET ability to hear the world's heartbeat

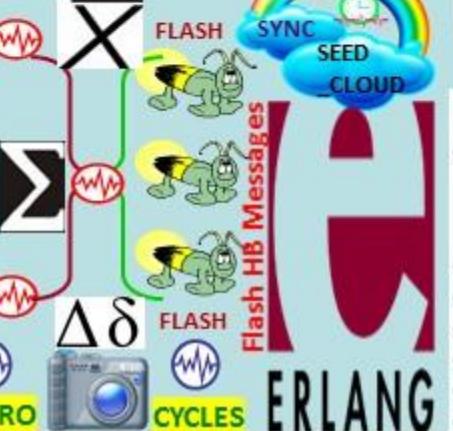


INFOCON  
5 4 3 2 1  
INFORMATION CONDITION

VECTOR: quantity having direction and magnitude  
position of a point in space relative to another point



Heartbeat synchronization strives to have nodes in a distributed system generate periodic, local "heartbeat" events approximately at the same time with a goal of all nodes starting and ending cycles at the same time eventually = map to closest OPTEMPO HEARTBEAT

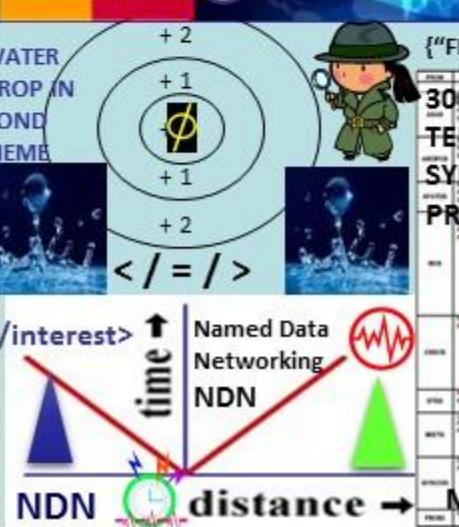


PAUL REVERE

LINEAR SEQUENTIAL

Functional Sequential Erlang

- Data types:
  - Integers (incl. BigNums), floats, atoms
  - tuples/records, lists/plists, binaries, funs
  - Maps (added in R17)
- single assignment
- pattern matching & guards
- closures (anonymous function data type)
- list comprehensions
- bit-syntax & binary comprehensions
- tail recursion & tail call optimization (TCO)



**B1: BUILDING BLOCK: TCP/IP HEARTBEAT TIME STAMP & DATA GET / PUT OF <ORG\_ID> / <URN> DURING MICRO CYCLES PRIOR TO DATA FUSION CENTER INSERTION**



BUILDING

BLOCKS

IEEE 1588 PTP

TASK MICRO CYCLES  
ON / OFF .0001

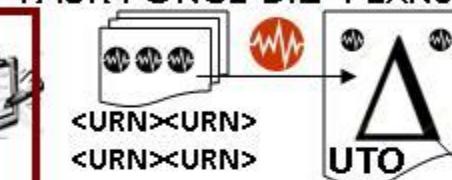
#BIG\_DATA

FEDERATED GROUP JOINS, MERGE, ADDS, DROPS

**B2: BUILDING BLOCK: ADAPTIVE, CYCLIC, ITERATIVE PROCEDURAL TEMPLATES: XML ARTIFACTS i.e., <ORG\_ID> TASK ORDER & K00.99 HEARTBEAT SYNC DELTA MESSAGES / STATE META DATA SNAPSHOTS IN NETWORK EXECUTION MANAGEMENT / NEO NET ENABLED OPERATIONS, MISSION AWARE NETOPS**

TASK FORCE BIZ PLANS

<ORG\_ID>



ADHOC / AGILE FEDERATED <ORG\_ID> GROUPS VS LEADER'S INTENT DECISIONS JOIN, MERGE, ADD, DROP, SPLIT, MOVE SUBNETS BUSINESS COURSE OF ACTIONS <ORG\_ID1><ORG\_ID2>

**B3: BUILDING BLOCK: PAUL REVERE LINEAR, SEQUENTIAL HOP COUNT MEME**

CLOUD, ENERGY NODE HOP COUNT METRICS, METERS SLA CLAUSES MOE, MOP METER IN TAX CODES, TRANCHE CLASSES / EVENT, ALERT TRIGGERS



vector TIME / DISTANCE,  
VECTORS, THRESHOLD,  
INTENSITY, DURATION

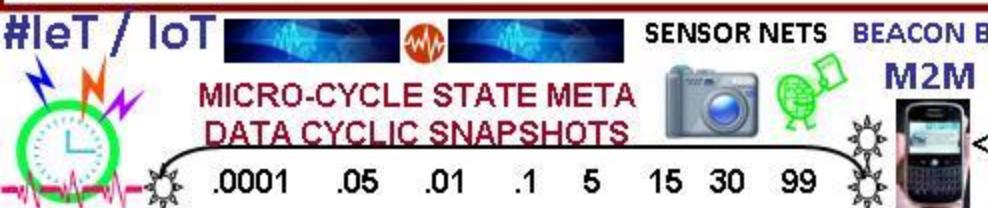
**B4: BUILDING BLOCK: WATER DROP IN POND RADIUS MEME, GEO-SPATIAL TEMPORAL INTENSITY**

SEARCH BY <UUID><ORG\_ID><URN>,  
REAL TIME AUCTION, CROWD SOURCING INVITES NEWSCASTS  
APPLIQUE' OVERLAYS

CONSISTENT METRICS / METERING

search search search search search search

Google



SENSOR NETS BEACON BROADCAST, NEWSCAST  
M2M

MAP VIEWS GEO-LOCATION SPECIFIC SHOW <URN> RESOURCES BY <ORG\_ID> <GROUP> / RESOURCE TYPE, EVENT, ALERT / NEWSCAST BY TRANCHE <CLASSES>

Cloudcenter Cloudcenter

S.O.S.

Cloudcenter



# TEMPLATE SYSTEM

## HEART BEACON TEMPLATE: DERIVED FROM DARPA SITUATIONAL AWARENESS SYSTEM COMMON BUILDING BLOCKS DESCRIBED IN PROCEDURAL TEMPLATE

FBCB2 / TIMS ON SAME PLATFORM

ALL FBCB2'S ON CURRENT HEARTBEAT

ARMY INFORMATION SERVER AIS

AIS

STATE MANAGER

WEB APPLICATION SERVER W/BUSINESS LOGIC EQUIVALENT TO MILITARY MISSION THREADS

9 AIS

C2R SERVER LDAP

GTCS

2

3

4A

GTCS 8

TIMS: TACTICAL INTERNET MANAGEMENT SERVER

MULTICAST GROUP MCG UPDATE TOOL

LDAP SERVER

GROUND TACTICAL COMMS SERVER GOTS GOVERNMENT STRUCTURED MILITARY MESSAGING

1

5

4

0  
MANEUVER  
CONTROL  
SYSTEM

MCS: 0

MANEUVER  
CONTROL  
SYSTEM

### B2: TEMPLATES



<XML>

SYNC DELTA /  
HEARTBEAT MESSAGES.  
STATE META DATA SNAPSHOTS  
NET OPS / NET MANAGEMENT



NETWORK INITIALIZATION DATA:  
NETWORK CONFIGURATION DATA

NETOPS / NEO:  
JOIN / MOVE  
SPLIT / MERGE  
ADD / DROP

NET MARKUP NETWORK SERVICE INTERFACE

NEWSCAST BEACON BROADCAST



### COMMON BUILDING BLOCKS



IEEE 802.1AG HOP BY HOP DETECTION  
IEEE 802.11 HbH HOP BY HOP CONTROL



CLOSER TO SOURCE / DESTINATION  
= CHEAPER, FASTER DELIVERY



SURVEY REFERENCE POINT

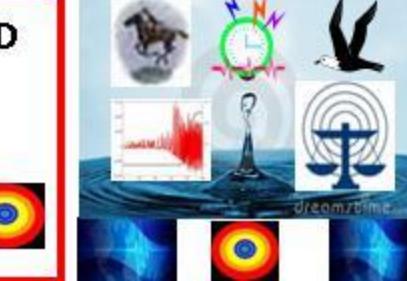
### B1: HEARTBEAT MESSAGES



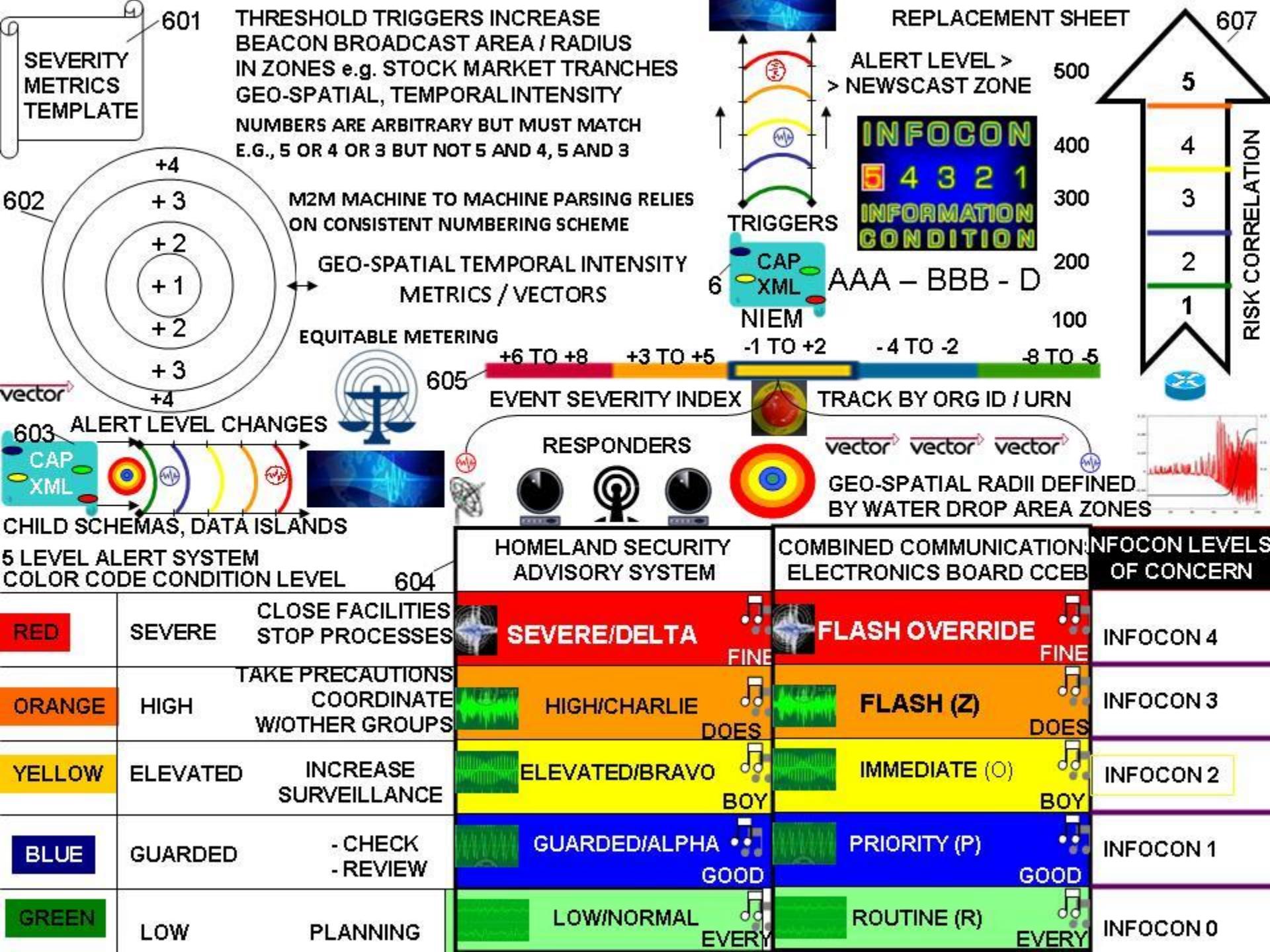
.0001 .05 .01 .1 5 15 30 99

B3  
PAUL REVERE MEME  
NODE TO NODE HOPCOUNT  
LINEAR, SEQUENTIAL

B4 WATER DROP IN POND  
AREA / RADIUS MEME  
GEO-SPATIAL TEMPORAL  
INTENSITY







# GEO-SPATIAL TEMPORAL INTENSITY METRICS, METERS, VECTORS



INFOCON / DEFCON ALERT EVENTS INFORM STAKEHOLDERS OF STATUS CHANGE i.e., NORMAL TO ELEVATED, HIGH OR SEVERE. ALERT LEVELS ARE ARBITRARY BUT MUST BE CONSISTENT e.g., 3 OR 5 FOR MACHINE TO MACHINE PROCESSING

Geo-Spatial Temporal Intensity NOVEL METRICS / METERS:



Paul Revere = linear, sequential

# NAMED DATA NETWORKING

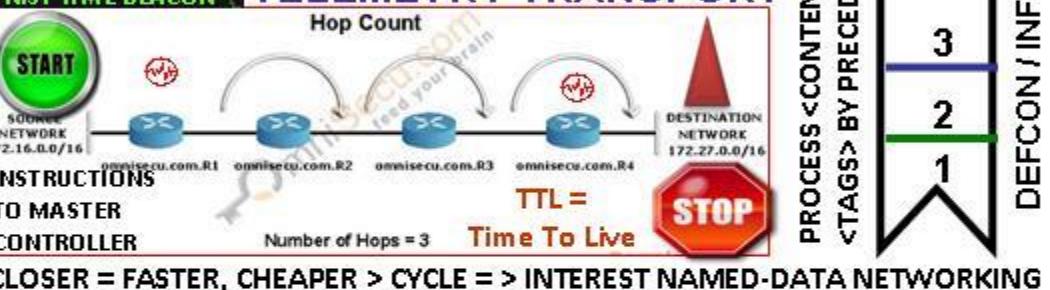
<INTEREST>  
time ↑  
distance →  
  
<CONTENT>

content →  
time ↑  
distance →  
  
ARRESTED-D



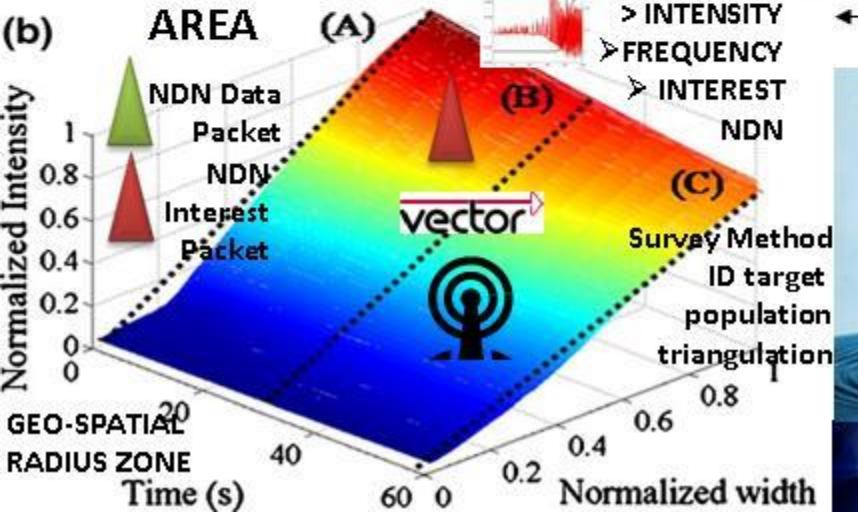
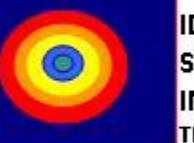
OASIS

IEEE 802.15.4  
OASIS MQTT  
TELEMETRY TRANSPORT

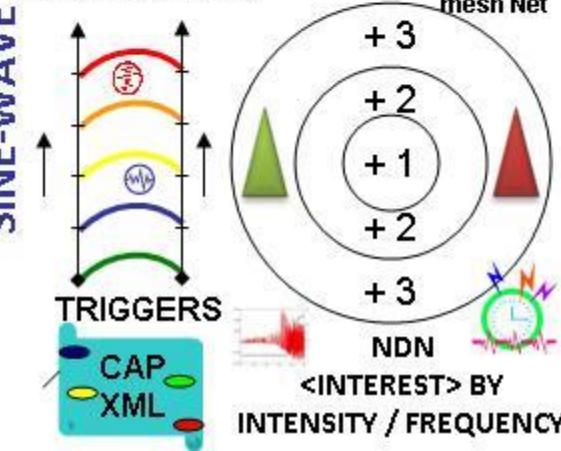


TCP/IP hop by hop counts, by hop controls

Water Drop = AREA / INTENSITY  
Cyclic Frequency

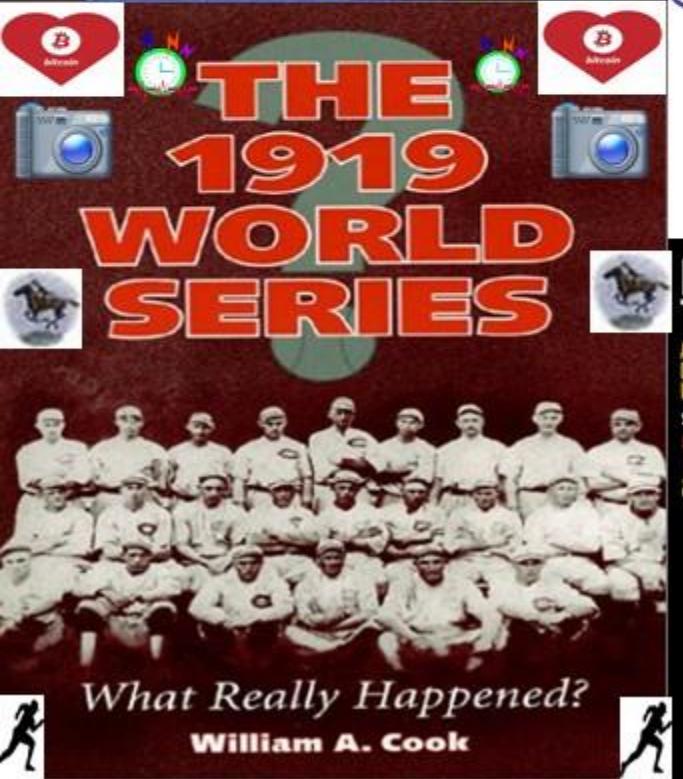
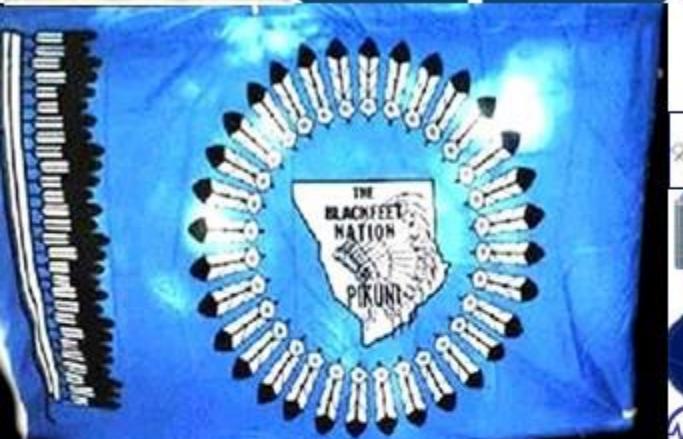


SINE-WAVE

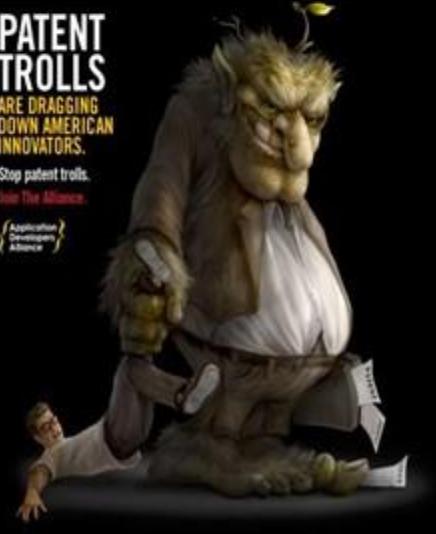


Interface Name	HEARTBEAT Administration Interface [SCOP]		
Documentation URL	<a href="http://scop.sourceforge.net/">http://scop.sourceforge.net/</a> <a href="http://linuxvirtualserver.org/software/index.html">http://linuxvirtualserver.org/software/index.html</a>		
API Information	     <b>#Big_Data</b>		
#IeT	Functionality Areas	Cloud Interface Management, configuration, start, stop cloud services, edit configuration (heartbeat messages)	
	API Operation Count	 LOCATE <CONTENT> IDMAPS / SonarHOPS  4 / 3 / 2 / 1 / NULL / 1 / 2 / 3 / 4  0.0001 .05 .01 .1 0 5 15 30 90 	
	Web service access type	Web application, front end to [network, device, system] heartbeat	
	LANGUAGE / PLATFORM BINDINGS	PHP  	
Interface Characteristics	  <p>SCOP is a web application, PHP based, that is a front-end to heartbeat, IP Virtual Server ipvs and Idirectord [check interval e.g., every 5 seconds] software. With SCOP you can start/stop services, view/ edit configuration files e.g., heartbeat message state management snapshots, make backups, take a server online/offline, add/ remove virtual/real servers, etc.</p>		





SAW Concepts LLC  
Simple (Always) Wins  
Owner's Father was  
Blackfoot Native  
American Indian Tribe



Alice Corp. v. CLS Bank International, 573 U.S. 134 S. Ct. 2347 (2014)  
"claims may not direct towards abstract ideas"

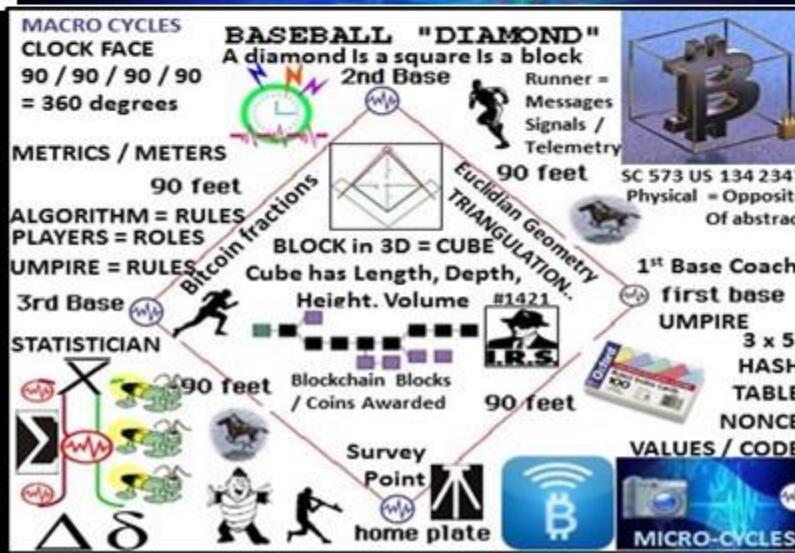


13/573,002



## USPTO SCREEN CAPTURES SUSPENDED PAIR RULES

- Moved Examination outside PAIR
- No need for forms, fees, amendments
- No Time Stamps = Temporal Ambiguity
- Screen captures before / after filing





# USPTO APPLICATION 13,573,002 The Heart Beacon Cycle Time – Space Meter, Applique' Overlay

GIZMAG: New NASA network poised to bring internet to entire solar system

SCt 573 ALICE CORP VS CLS BANK PHYSICAL MEMES

INTERNET TCP/IP "PING", "HOPS",  
"PACKETS", FRAMES = METAPHOR



TIME / DISTANCE SERVICE LEVEL  
AGREEMENT SLA / O Operations

IEEE 802.15.4 OASIS MQTT

TELEMETRY TRANSPORT

IEEE 802.1AG HOP BY HOP  
DETECTION

HOP BY HOP CONTROL

Unused Resources / Unmet Needs



IEEE 802.11

/localhost/nfd/fib/add-nexthop

Geo-Spatial Temporal

Metrics, Meters

DISTANCE

INFO SERVICE

Time Series

Risk

Value

Time

WATER DROP IN POND MEME IS  
SONAR NAVY METAPHOR / MEME

IDMaps

SonarHops

5

602

4

+3

+2

+1

Null

0

+1

+2

+3



UNUSED RESOURCES  
UNMET NEEDS

Spatial  
Econometrics

Spaceship  
Earth  
Signals &  
Telemetry  
Annex  
*buckminster fuller  
operating manual  
spaceship earth*

TIME-SPACE BEACON  
METRICS / METERS  
TRADE WITH EARTH  
???  
INFOCON

5 4 3 2 1  
INFORMATION  
CONDITION



SIRIUS DISCLOSURE

"Numbers are the  
Universal Language  
offered by deity to humans as  
confirmation of the truth"

NAMED DATA  
NETWORKING

603

Attribute Series

PAUL REVERE  
LINEAR, SEQUENTIAL

RADIUS

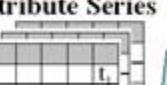
INTENSITY  
WATER DROP IN POND MEME

TCP/IP HOP BY HOP COUNT

+1

+2

NULL



Geo  
Spatial

INTEREST  
DISTANCE

Temporal Series

IEEE C37.118  
Harmonization  
& Sync heartbeat  
update Interval

135

CLOSER SOURCE  
CHEAPER RATE

136

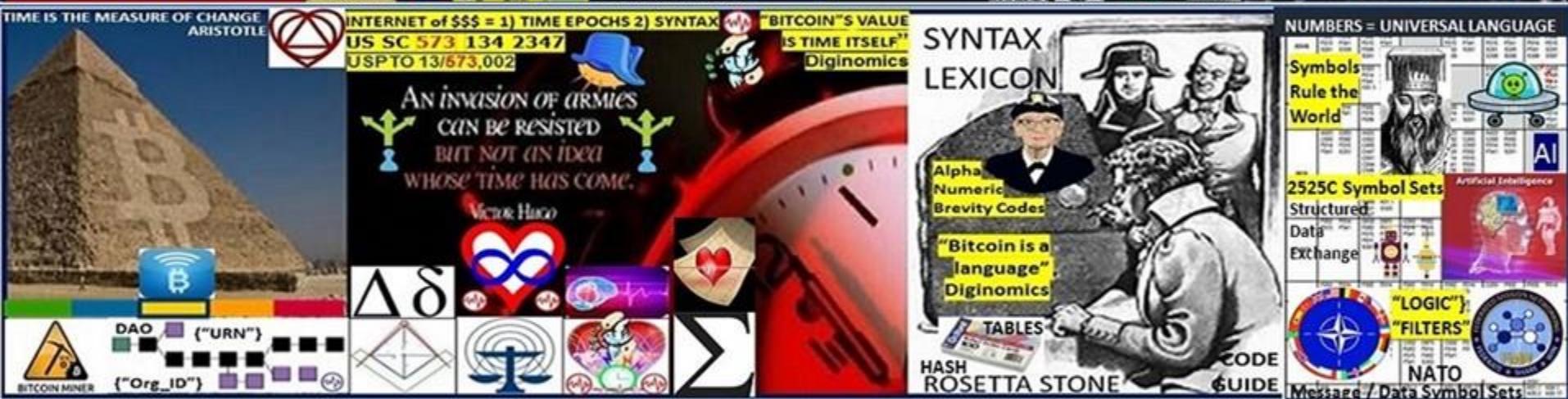
Energy Attenuates over Distances

TESLA

MICROGRIDS Closer - Cheaper

Blockchain  
MICROGRIDS









**Heart Beacon** is an interactive enclosure of light, color and sound that senses and artistically displays the heartbeats of visitors who lay their hands on the piece. This highly interactive sculpture takes the literal and metaphoric ‘pulse’ of the Portland community. The sculpture takes inspiration from the life-saving mission of the Emergency Coordination Center.

**WEB PAGE**

<http://www.jbpublicart.com/portfolio/heart-beacon-2> [LINK](#)

**Dimensions:** 9' x 9' x 18'

**Materials:** stainless steel, acrylic, LED lighting, electronics, sound transducers,  
**HEARTBEAT SENSORS**

**Location:** Emergency Coordination Center, Portland, OR

**Commissioning Agency:**  
City of Portland

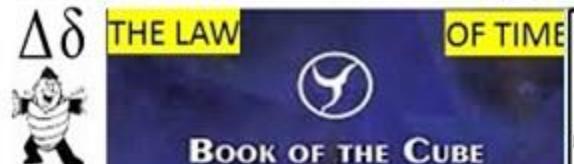
USPTO APPLICATION 13/573 002

The Heart Beacon Cycle Time-Space Meter

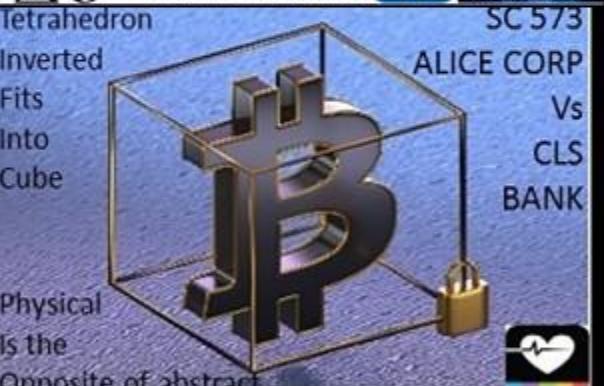
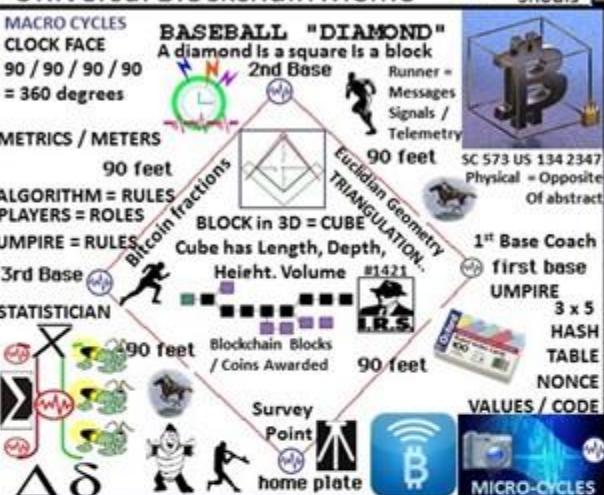
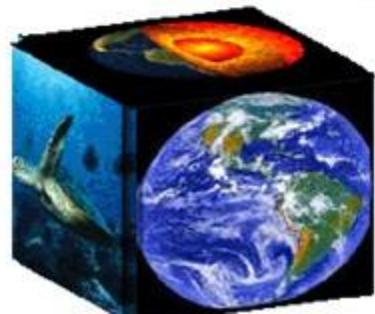
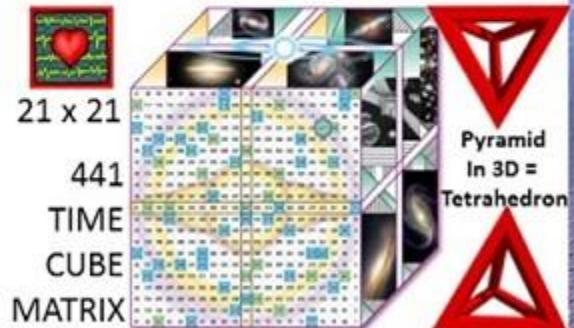
Main Embodiment: Baseball Diamond = block in 3D = cube

$$1 + 3 + 5 + 7 + 3 + 2 = 21 \quad 21 \text{ squared} = 441$$

"We can synchronize ourselves in time for a common purpose" Universal Blockchain Meme



First  
Baseball  
Players  
Union  
Formed  
1870



INSTITUTE OF HEARTMATH®

Empowering Heart-Based Living  
<https://www.heartmath.org>





"May the heart of Earth flow to the heart of heaven through my heart and through all hearts together. May our hearts be the heart of every being in all the starry sky, May the heart of the heavens flow to the heart of the earth through my heart and though all of our hearts together. And, may our hearts be the heart of every earthly creature". Chichicastenango Guatemala from "Stargate 2012: Surfing the tides of the Milky Way as drawn from ancient Mayan prophecies.