

# Epoch Time Cycles / Syntax

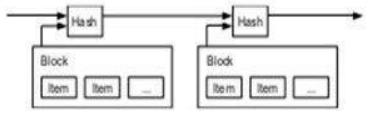


Internet / Internet of Money building blocks

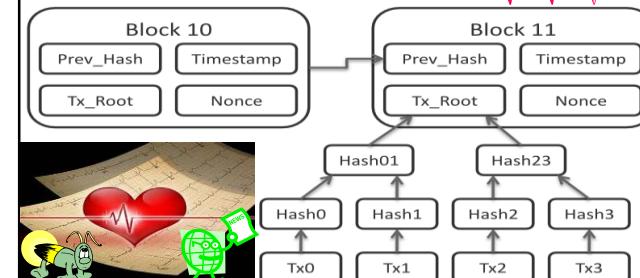


### 3. Timestamp Server

The solution we propose begins with a timestamp server. A timestamp server works by taking a hash of a block of items to be timestamped and widely publishing the hash, such as in a newspaper or Usenet post [2-5]. The timestamp proves that the data must have existed at the time, obviously, in order to get into the hash. Each timestamp includes the previous timestamp in its hash, forming a chain, with each additional timestamp reinforcing the ones before it.

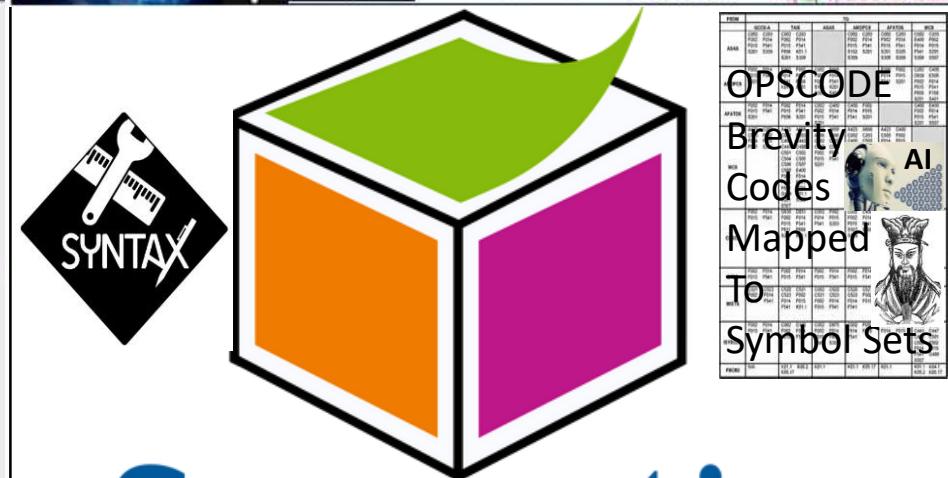
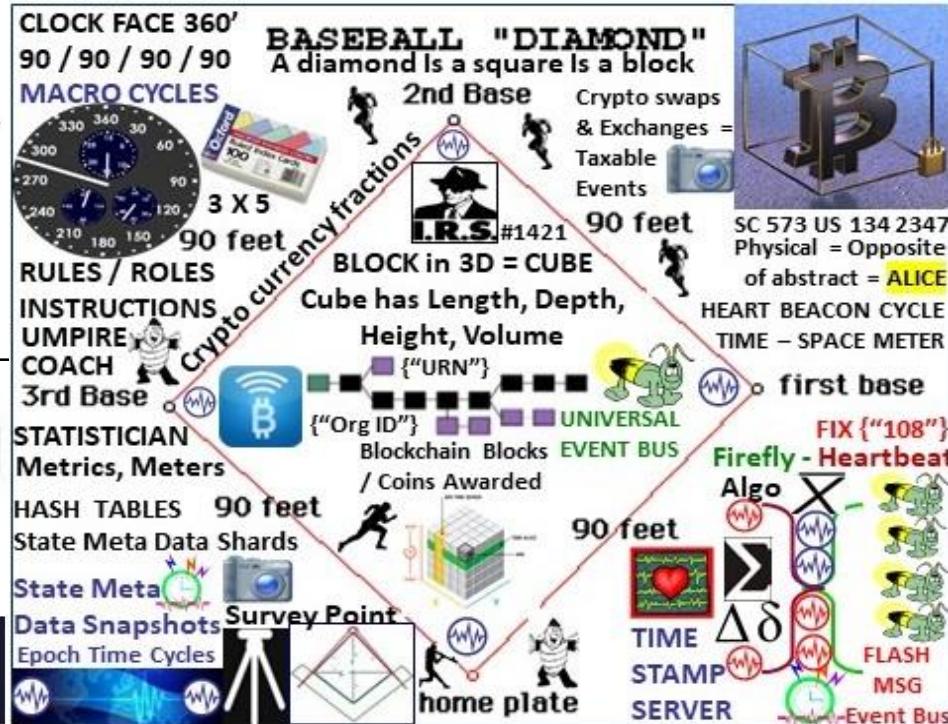
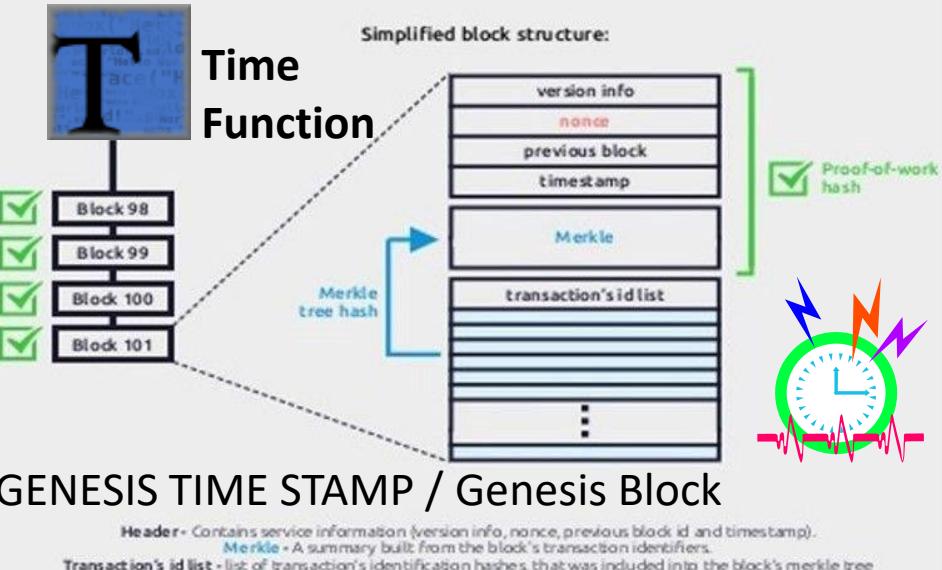


THE SOLUTION WE PROPOSE BEGINS WITH A TIME STAMP SERVER



## Block chain

What does a block look like?



# Semantic blockchain

OPSCODE
Brevity
Codes
Mapped
To
Symbol Sets





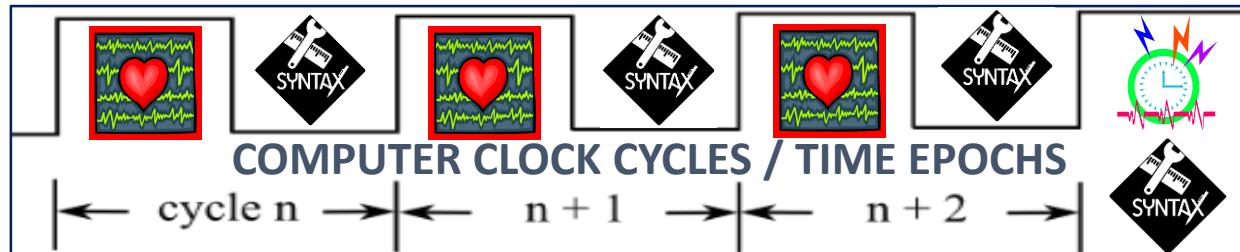
# Time Epochs / Syntax:





# Crypto Currency Programmable Blockchain Money

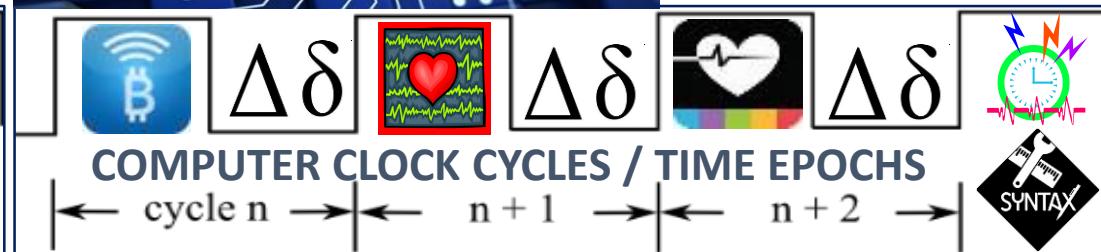
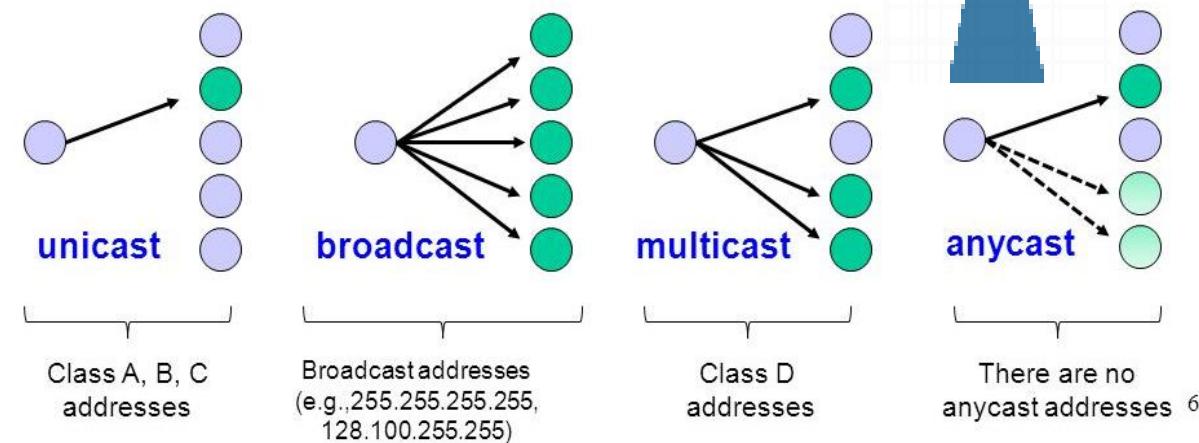
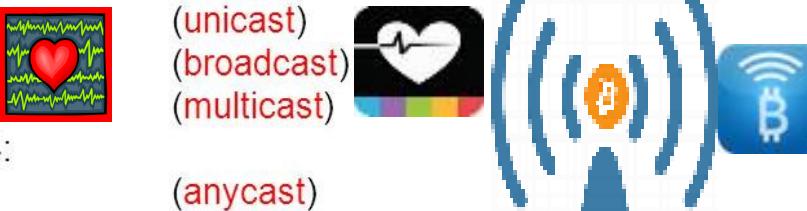
# **How the net, net of \$ actually work...**



- one-to-one
  - one-to-all
  - one-to-many

• Not supported by IPv4:

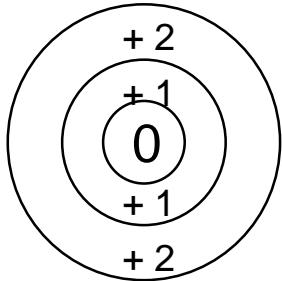
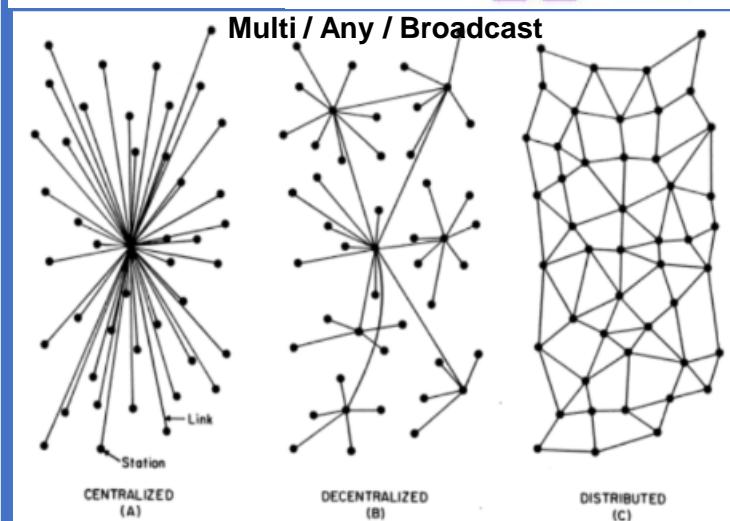
  - one-to-any



**UNICAST =**



Time Epochs...Time is \$\$\$



# **Null 0 = Genesis Time Epoch**

All things internet, programmable net of money are formed using:  
1) Epoch Time Cycles to 2) process (not) syntax as instructions

# Net of \$\$\$ formed with: EPOCH TIME CYCLES {"Syntax"} Instructions

"In the beginning"

"The Word"

"All things internet, Internet of money are formed using time epoch cycles to process, parse, syntax as instructions"

"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"



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

	INDIA	CHINA	U.S.	EUROPE	MIDDLE EAST	PACIFIC
XBRL / CDL / DAML						
STOCK MIC CODES						
STRUCTURED DATA EXCHANGE TEMPLATE FORMS						
300+ USE CASES						
LOGIC / FILTERS						
SYNTAX / SYMBOL LEXICON LIBRARY						



SYNTAX LEXICON Library



STRUCTURED DATA EXCHANGE TEMPLATE FORMS



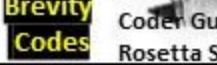
300+ USE CASES



LOGIC / FILTERS



SYNTAX / SYMBOL LEXICON LIBRARY



Coder Guide Rosetta Stone



DIGINOMICS

"Bitcoin is a LANGUAGE"  
"Bitcoin's Value is TIME itself"  
"Time is specified in units of block transaction confirmation times"



"BITCOIN MAKES MONEY PROGRAMMABLE.  
MONEY IS SIMPLY DATA"

WIRED

ALICE CORP VS CLS BANK

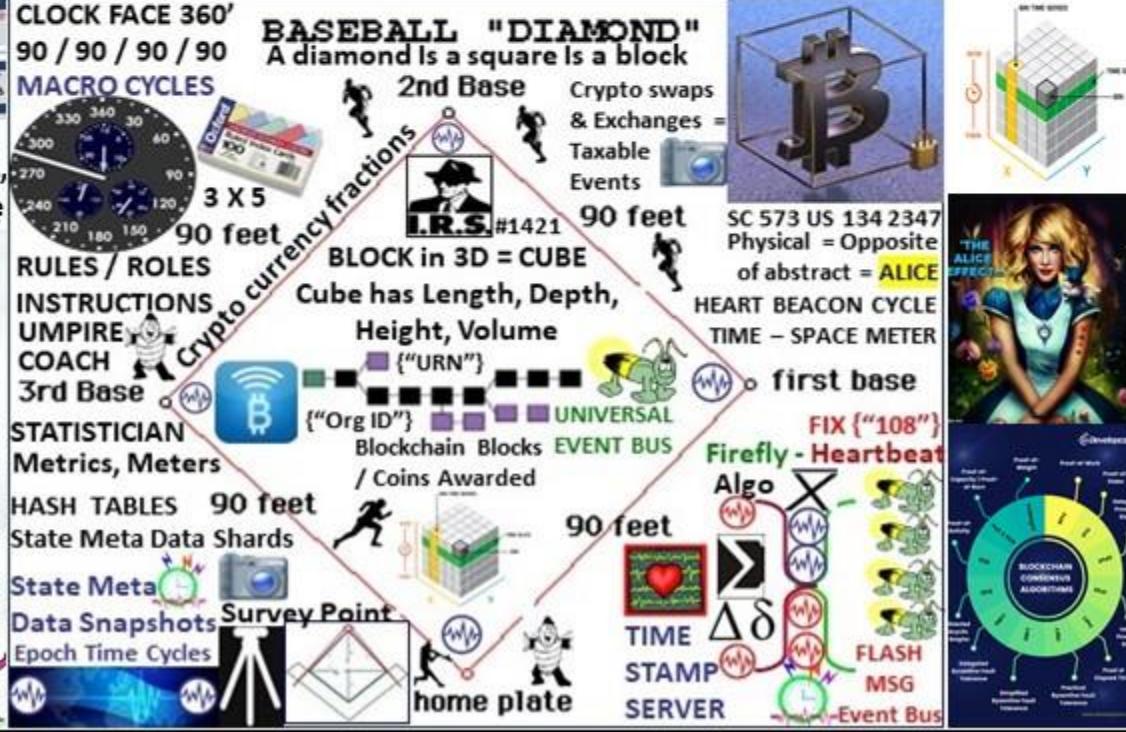
"claims may not be directed towards an abstract idea"



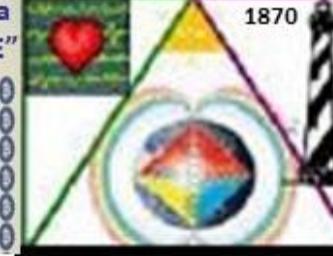
US SC 573 US 134 2347

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

USPTO 13/573,002 BASEBALL MEME PHYSICAL = OPPOSITE OF ABSTRACT



# THE BITCOIN BLOCKCHAIN FOR DUMMIES



1870

What is needed is an electronic payment system based on cryptographic proof instead of trust, allowing any two willing parties to transact directly with each other without the need for a trusted third party e.g., a bank.

Satoshi Nakamoto Bitcoin Paper

Satoshi Nakamoto

Craig WRIGHT  
a.k.a.

THE VALUE OF  
BITCOIN IS  
TIME ITSELF

Wright Brother's 1<sup>st</sup> Flight  
Cape Hatteras Outer Banks

"THE SOLUTION WE PROPOSE BEGINS WITH A TIME STAMP SERVER"



All things internet of money are formed w CPU time cycles used to process, syntax, instruction / code



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



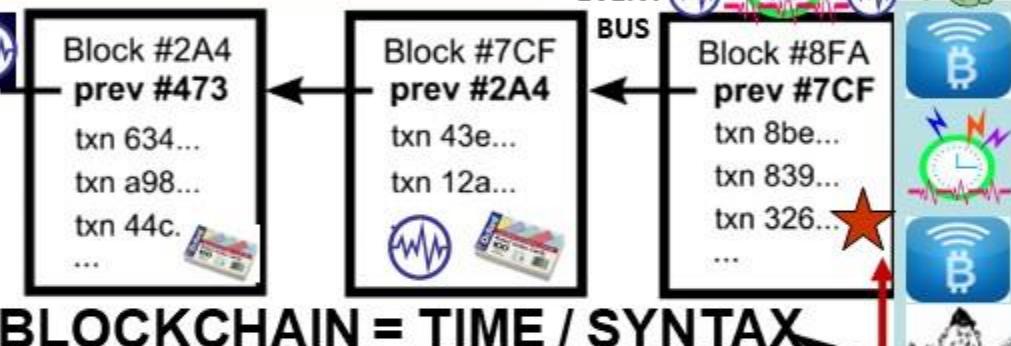
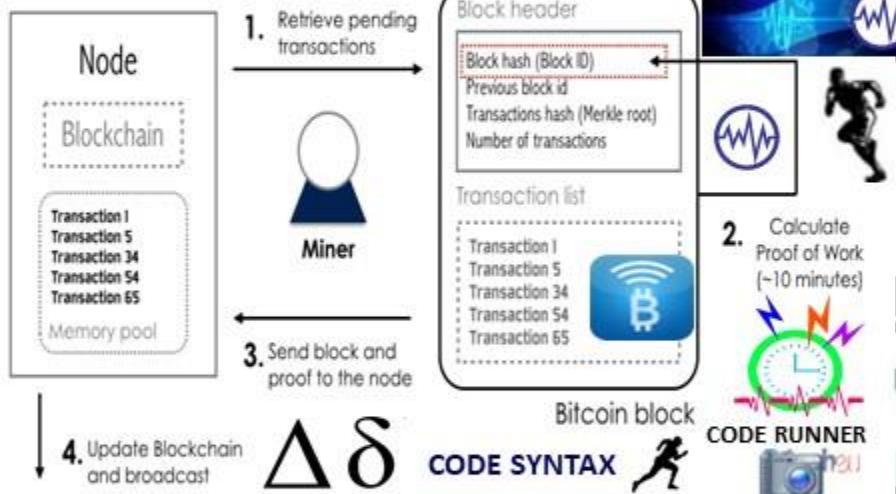
"Bitcoin is a Language"

WIRED

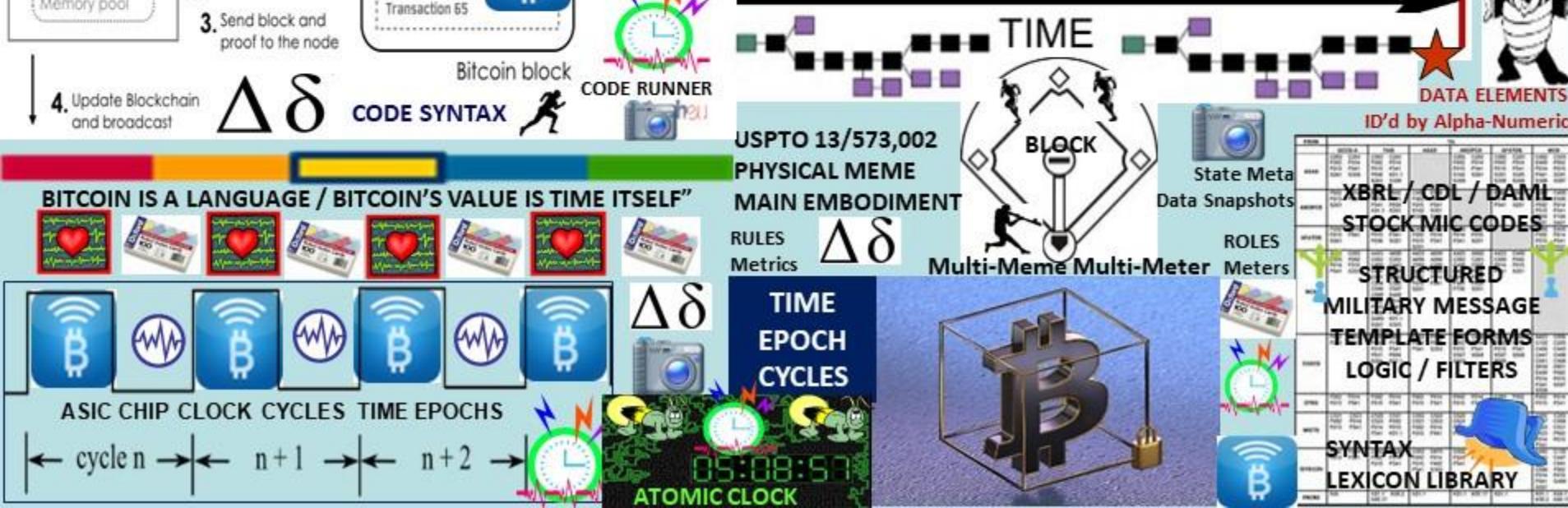
"BITCOIN MAKES MONEY PROGRAMMABLE.  
MONEY IS SIMPLY DATA"



Alice Corp. v. CLS Bank International, 573 U.S. 134 SCt 2347 (2014) is 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**



**Q: What US Supreme Court Alice compliant (physical = opposite of abstract) meme describes the myriad #blockchain #consensus #algorithms the most comprehensively that uses an algorithm (based on nature) enabling distributed system of systems geo-spatial, UTZ Universal Time Zone temporal, semantic - syntactic sync / OPSCODE brevity code consensus?**

## Blockchain Consensus Algorithms & Mechanisms

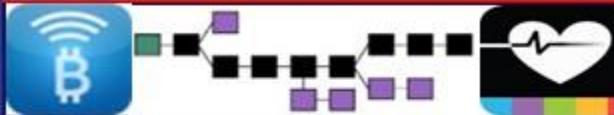
In the world of blockchain consensus algorithms, consensus is the **HEART OF THE BLOCKCHAIN NETWORK**. Its main purpose is to

**achieve agreement on transactions among a distributed system (s)**  
**Proof of Formulation: PoF: generation / propagation of blocks**  
**using a previously agreed sequence between participants of the**  
**generation of blocks, formed by two groups: a generator group**  
**and/or Formulator and a group of synchronization.**

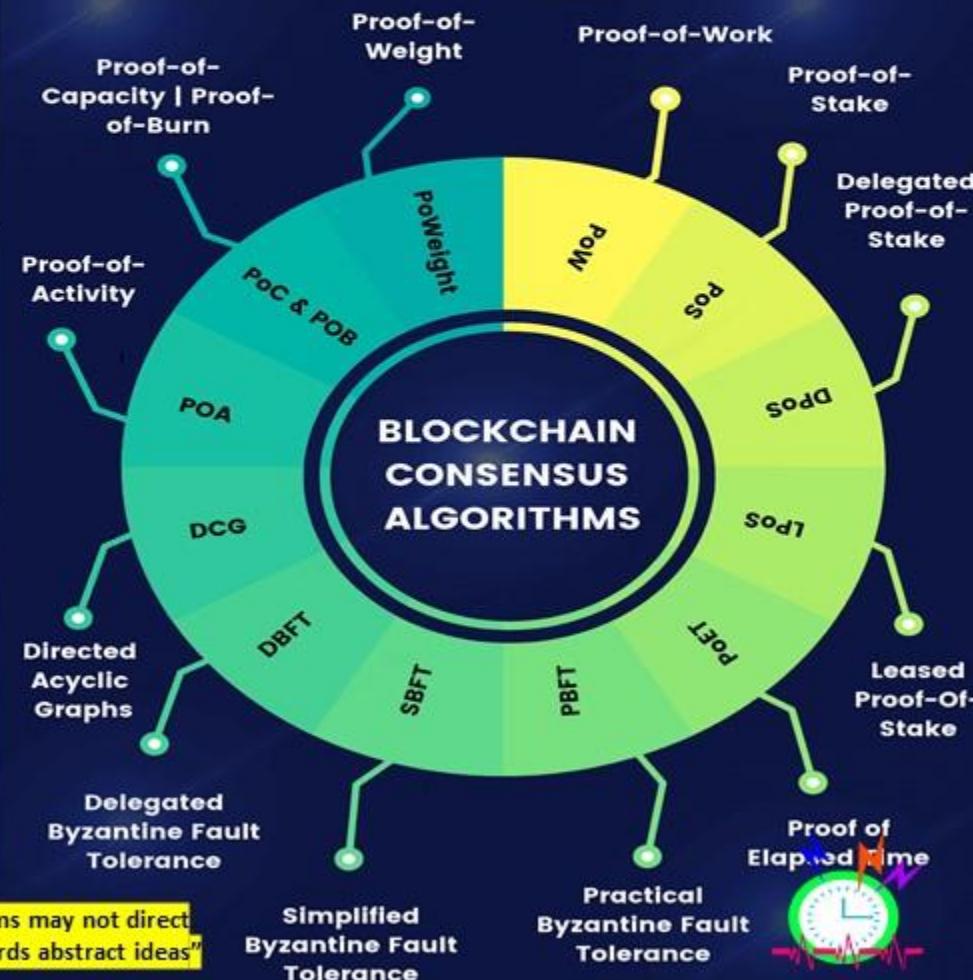


# **BLOCKCHAIN CONSENSUS ALGORITHMS**

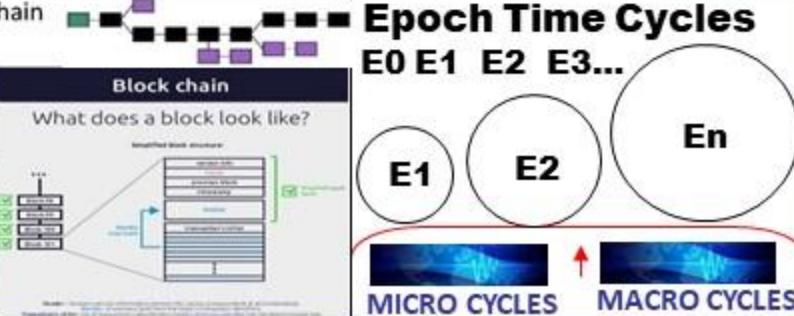
ULTIMATE GUIDE FOR BEGINNERS

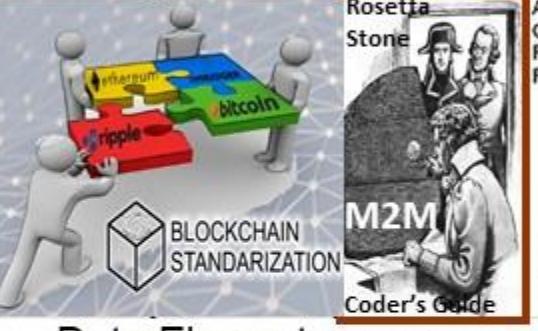
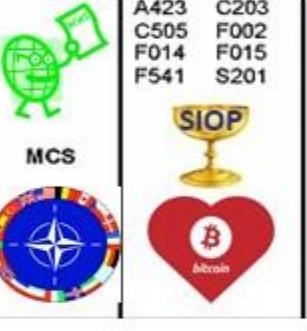
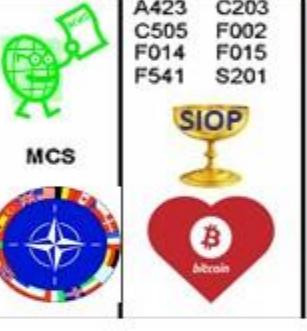


 Developcoins



SOURCE: <https://developcoins.com/blockchain-consensus-algorithms>

Interface Name	<b>HEARTBEAT</b> 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  #leT   #Big_Data 	Functionality Areas   Idea 	Cloud Interface Management configuration, start, stop cloud services, edit configuration (heartbeat messages)	
Programmable Money World Computer / Blockchain  	API Operation Count 	Web service access type Network Effects / A.I.	Web application, front end to [network, device, system, blockchain] heartbeat
LANGUAGE / PLATFORM BINDINGS  Interface Characteristics  	PHP Java Erlang... 	SCOP is a web application, PHP based front-end to heartbeat, IP Virtual Server ipvs and Idirectord [e.g., check interval @ 5 seconds] SCOP can start/stop services, view/ edit configuration files e.g., heartbeat message state management snapshots, backups, take a service online/offline, add/ remove virtual/real servers, services etc.	
"The external environment could update resources at random... One solution is a heartbeat: defining a default lease duration delaying updates until the next cycle"    QubitCoin Interval: Every 30 Seconds	Satoshi Bitcoin Blockchain Time Stamp Server 	Epoch Time Cycles E0 E1 E2 E3... 	

FROM		ALPHA-Numeric BREVITY CODES						CODE GUIDE																																																																															
GCCS-A		C002 C203	C002 C203	C002 C203	C002	ATDS	MCS																																																																																
ASAS	GCCS-A	C002 C203 F002 F014 F015 F541 S201 S309				C203 F014 F541 S305 S309	C002 C203 E400 F002 F014 F015 F541 S201 S309 S507																																																																																
		<b>USMTF / XML MTF FORMATTED MESSAGE CATALOG = 300 + messages</b> info exchange sets using common, <b>CONSENSUS Message Text Formats</b> MTFs. MTFs specify </CONTENT> / info agreed by group consensus presenting information in a logical, well specified unambiguous layout resulting in a highly <b>efficient info payload to overhead ratio</b>																																																																																					
		A423 C203 C505 F002 F014 F541 S201		Rosetta Stone M2M Coder's Guide	A423 C400 C505 F002 F014 F541 S201																																																																																		
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<p align="center"><b>FEDERATE</b></p>																																																																																							

## Information Elements Roles

- COI Determination Org Interaction
  - Search and Discovery
  - Ontologies STANDARDS
  - Taxonomies REFERENCE
  - Metadata Attributes / Filters
- ("Org\_ID") {"URN"} FILTERS



FFUDN: Field Format Unit Designator #

FFIRN Field Format Index Reference #

Structured military messaging ID's  
messages, message sets, data  
element, symbol fields



BY Form Field Position & NUMBER



PROCESS MESSAGE BY PRECEDENCE  
UNIVERSAL EVENT / ALERT MESSAGE BUS

## OPERATIONAL NODES / ACTIVITIES

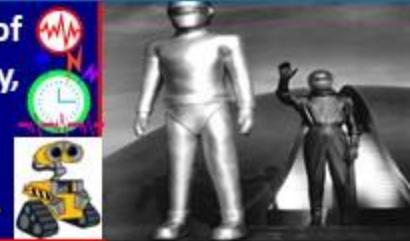
DATA	SYSTEM FUNCTIONS	PERFORMANCE
11.4 - Classification	11.8 - Kinematics	
11.4.1 - Category	11.8.1 - Pos / Vel / Acc (PVA)	
11.4.1.1 - Confidence Level	11.8.1.1 - Acceleration	11.8.1.1.1 - Angular
11.4.1.2 - Estimate Type	11.8.1.2 - Linear	11.8.1.2.1 - Alternative
11.4.1.2.1 - Alternative	11.8.1.2.2 - Estimated	11.8.1.2.2.1 - Observed
11.4.1.2.2 - Evaluated D	11.8.1.2.2.2 - Predicted	11.8.1.2.3 - Spotted
11.4.1.3 - Value	11.8.1.2.4 - Smoothed Data	
	CODES	

**SYMBOL**   **Friend**   **Neutral**   **Hostile**   
**2525C**   **Partner**    **Competitor**

11.4.1.3.5 - Surface	1 - Velocity
11.4.2 - Platform / Point / Feature Type	1.4.1 - Horizontal
11.4.3 - Specific Type	1.4.2 - Vertical
11.4.4 - Type Modifier	VA Confidence
11.4.5 - Unit	1 - Bearing Angle
	2 - Bearing Angle Rate
	3 - Covariance Matrix



**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"}, INDEX REFERENCE #: M015 STATUS : EFFECTIVE: 14-DEC-99  
**vector**  
 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 // (NU) OPERATION CODEWORD  
 M MIOPV1 1 MSGID 3 /M /M /O /O /O // (NU) MESSAGE IDENTIFIER  
 M MIP OUT ORDPLAN 4 /M /O /O /O // (NU) PLAN ORDER REFERENCE  
 M // (NU) REFERENCED MESSAGE  
 DATE-TIME GROUP  
 M /M /M /M /C // (NU) ORGANIZATION DESIGNATOR  
 M // (NU) 1.A ENEMY FORCES / COMPETITORS  
 M // (NU) 1.B FRIENDLY FORCES / TRADE FEDERATION  
 M // (NU) 1.C ATTACHMENT / DETACHMENT  
 M // (NU) 1.D COMMANDERS EVALUATION  
 O 11NUPRES GENTEXT 12 /M /M // (NU) 1.E ENVIRONMENTAL INFORMATION  
 M 11NUPRES GENTEXT 13 /M /M // (NU) 2. MISSION K00.99 / FIX / SWIFT / E-911 Heartbeat Message  
 M 11NUPRES GENTEXT 14 /M /M // (NU) 3.A CONCEPT OF OPERATION  
 O 11NUPRES GENTEXT 17 /M /M // (NU) (3) RECONNAISSANCE SURVEILLANCE  
 O 11NUPRES GENTEXT 21 /M /M // (NU) (5) INFORMATION OPERATIONS  
 O 11NUPRES GENTEXT 28 /M /M // (NU) (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 (Logistics)  
 M 11NUPRES GENTEXT 37 /M /M // (NU) 4. MATERIEL AND SERVICES  
**BLOCKCHAIN STANDARIZATION**

STOCK EXCHANGE MIC CODES NDN NAMED DATA NETWORKING PRECEDENCE PROCESSING  
**FILTERS** INFOCON 5 4 3 2 1 INFORMATION CONDITION  

SYMBOLS	Friend	Neutral	Hostile	MEDICAL EVAC & HOSPITALISATION
	Partner		Competitor	- MILITARY OPERATIONS

**NUMBERS ARE THE UNIVERSAL LANGUAGE / Symbols Rule the World"**

**Electronic Product Code Information Services (EPCIS)**  
**GS1** Standard for creating, sharing visibility event data

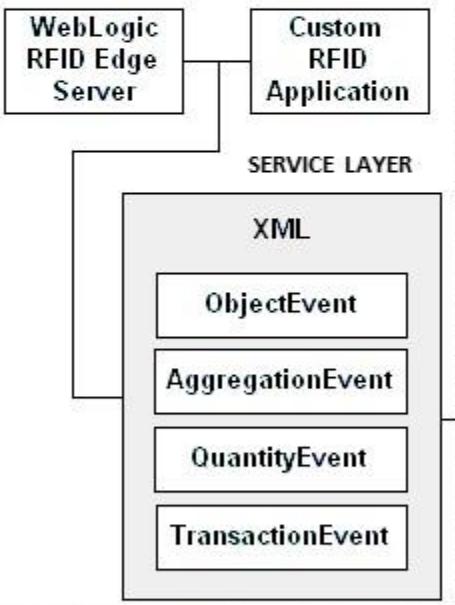


**HBC**  
SYSTEM OF SYSTEMS  
TIME-SPACE SYNC

## UNIVERSAL EVENT BUS

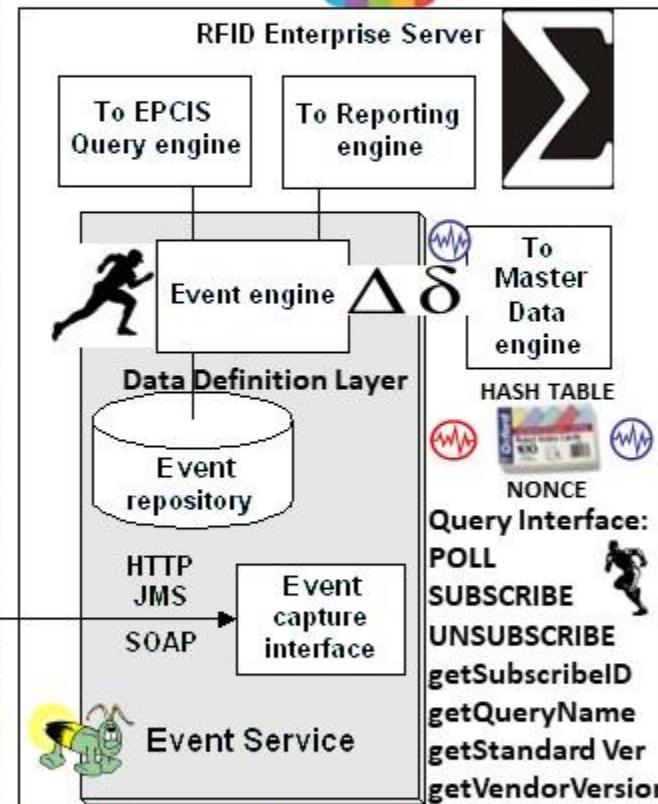
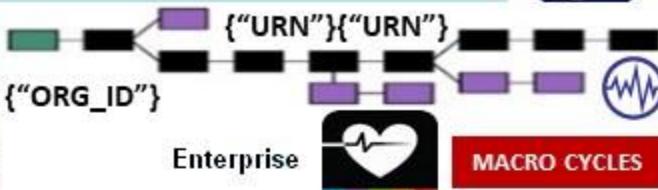


## EPCIS DATA MODEL



## 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



1



**Proximity Wireless Sensor Networks in Combination With RFID ..** on reading tag in RF-field the router sends heartbeat message

## RFID Configuration TCP/IP heartbeat message

## STRUCTURED DATA EXCHANGE / STRUCTURED MILITARY MESSAGES

**FIELD DIGITATION  
WORK CENTRIC WARFARE**

**ALPHA NUMERIC  
BREVITY CODES**

A small, rectangular illustration showing two men from the chest up. The man on the left wears a tall, dark tricorn hat and has a serious expression. The man on the right has powdered hair and is looking slightly to the side. They appear to be in a formal setting, possibly a courtroom or a government office.

A black and white photograph showing a man in a military uniform, including a cap with insignia, standing next to a large painting of a figure.

Compiler  
SIGN

An illustration showing a close-up of a person's hand holding a small pink flower. To the right, a small figure wearing a pink jacket and glasses is standing next to the flower.

# SOFTWARE DEFINED NETWORKING

NETOPS

Command Syntax

REST State Transfer

COMMAND SYNTAX  
STATE TRANSFER  
Unicast / Multicast  
Flow Tables / Workflow

Dynamic Network

NETOPS

COMMON COMPONENTS, BUILDING BLOCKS USED WITHIN  
FEDERATION PROMOTING COMMON GOALS, PROCESSES

- 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



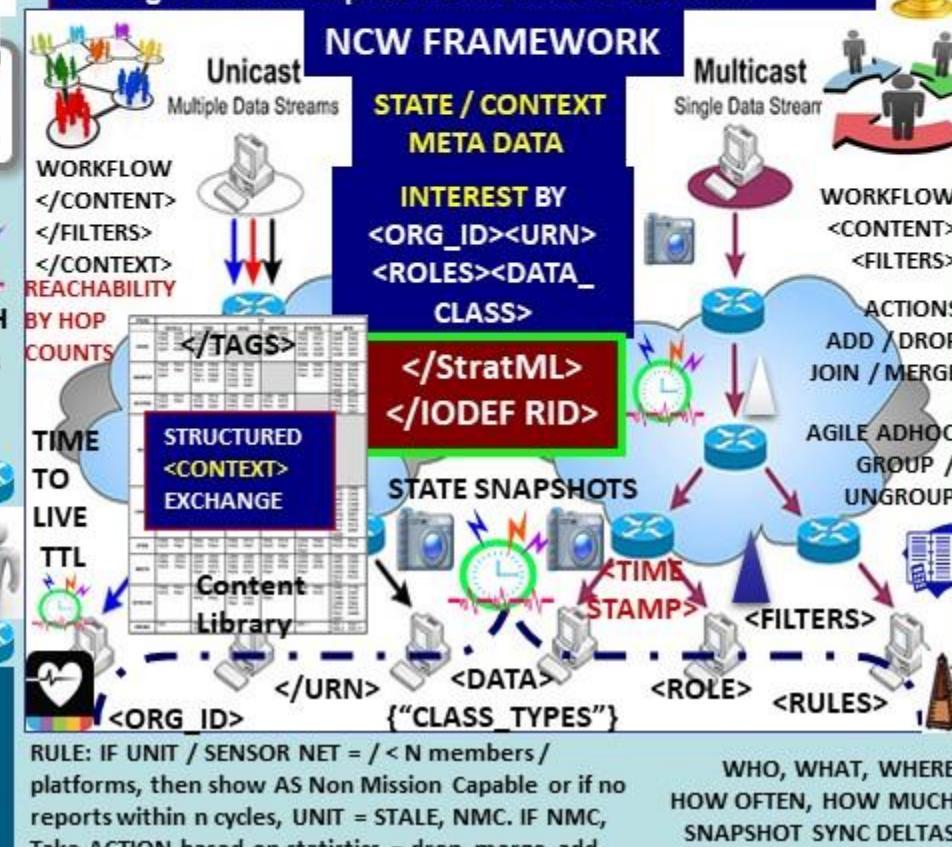
**FORWARDING INFORMATION BASE FIB**  
PACKETS ARE **TIME CYCLES** USED / NOT USED TO PROCESS / NOT PROCESS INSTRUCTIONS  
DESCRIBED AS **SYNTAX** = STATE META DATA TYPE BY DATA </CLASS> / DATA </CONTEXT>

**DISTRIBUTED APPS AND WORKFLOW AUTOMATION**  
Socket Plane = TEMPLATES = vendors use one standard, while optimizing own technologies for differentiation.  
COMPONENT factory multi-platform



Netcentric / "network-centric" participating in a continuously evolving, complex community of people, devices, information and services interconnected by a network to optimize resource management and provide information on events and conditions.

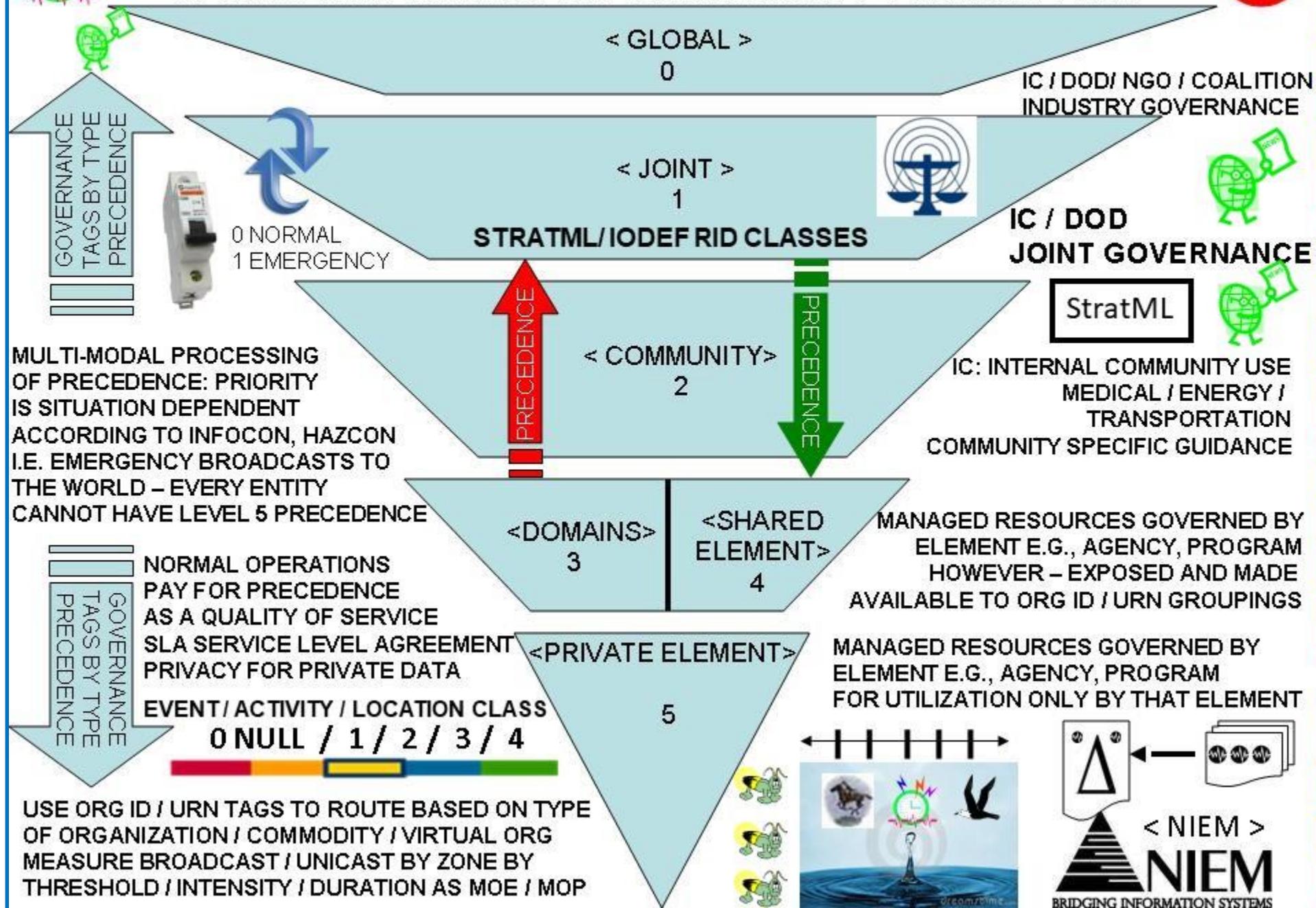
Net-centric Enterprise Architecture : "massively distributed architecture with components, services available across and throughout an enterprise's entire lines-of-business."



WHO, WHAT, WHERE  
HOW OFTEN, HOW MUCH  
SNAPSHOT SYNC DELTAS



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



# GEO-SPATIAL TEMPORAL INTENSITY METRICS, METERS, VECTORS

vector

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

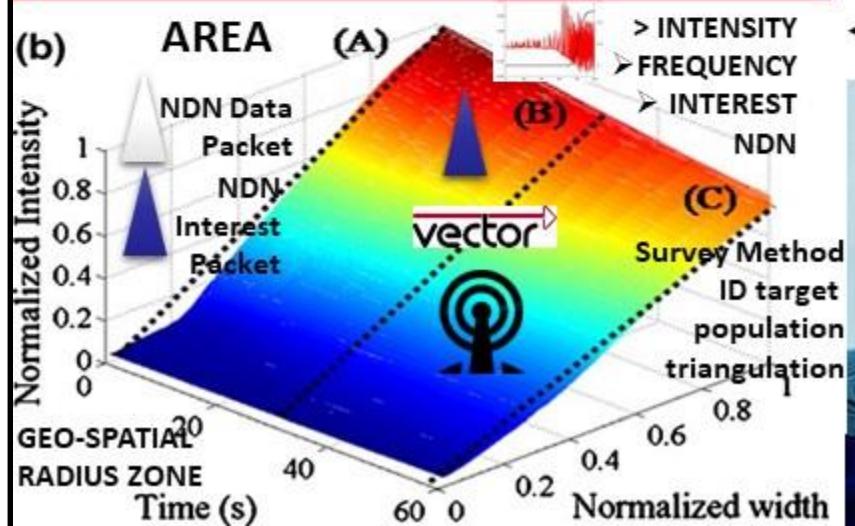
Geo-Spatial Temporal Intensity NOVEL METRICS / METERS:

Paul Revere = linear, sequential



TCP/IP hop by hop counts, by hop controls

Water Drop = AREA / INTENSITY Cyclic Frequency



# NAMED DATA NETWORKING

<INTEREST>

</IoT>  
MQTT



NIST TIME BEACON

time ↑  
distance →

ARRESTED-D

Hop Count



TELEMETRY TRANSPORT

OASIS

IEEE 802.15.4

OASIS MQTT

CLOSER = FASTER, CHEAPER > CYCLE = > INTEREST NAMED-DATA NETWORKING

XML  
MTF  
300 +  
MSG

INFOCON  
INFORMATION CONDITION

<CONTENT> TEMPLATES

OASIS

IEEE 802.15.4

OASIS MQTT

TELEMETRY TRANSPORT

INFOCON  
INFORMATION CONDITION

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# Situational Awareness Reference Architecture (SARA)

: Identity, Inventory, Activity, and Sharing    <http://ics-isac.org/sara/>



ICS-ISAC



**IDENTITY:** <UUID> = Devices, sensors  
Federation  
Gateway

<ORG\_ID> Organizations

<ELEMENTS>

STRATML / IODEF RID CLASSES:

<GLOBAL><JOINT><SHARED>

<DOMAIN><FEDERATION>

<CITY><STATE><PRIVATE>

STRATEGIC  
MARKUP

StratML

LANGUAGE

Industrial Control System  
Information Sharing and  
Analysis Center

IODEF

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

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



<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>

GEO-SPATIAL TEMPORAL  
INTENSITY METRICS / METERS



**SHARING:**

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



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

<TAG>  
LIBRARY

<TAG> LIBRARY  
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



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

## MV=PQ Money x Velocity = Price x 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.



## HOW GAMIFICATION WORKS:

### 5 COMMON MECHANICS



Measure a user's achievements  
in relation to others  
Can double as currency to  
exchange for rewards



Reward achievements visually



Encourage users to progress  
and unlock new rewards



Organise players by rank



Encourage engagement by  
offering specific tasks to complete

### 4 MAIN WAYS TO DRIVE ENGAGEMENT



### ACCELERATED FEEDBACK CYCLES



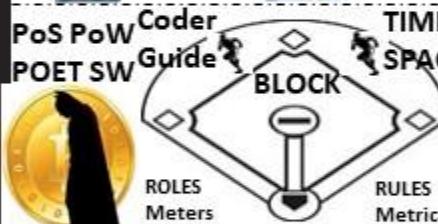
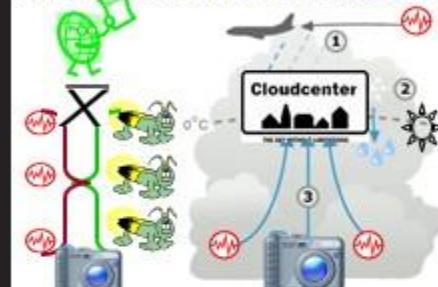
### CLEAR GOALS AND RULES OF PLAY



### A COMPELLING NARRATIVE



### CHALLENGING BUT ACHIEVABLE TASKS





## 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



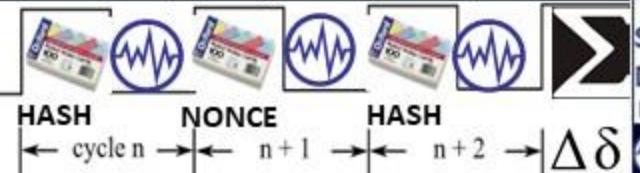
THROTTLE equivalent to difficulty. State  
•target = maximum value of 8 bytes  
Snap (2^64) divided by the difficulty.

Shots

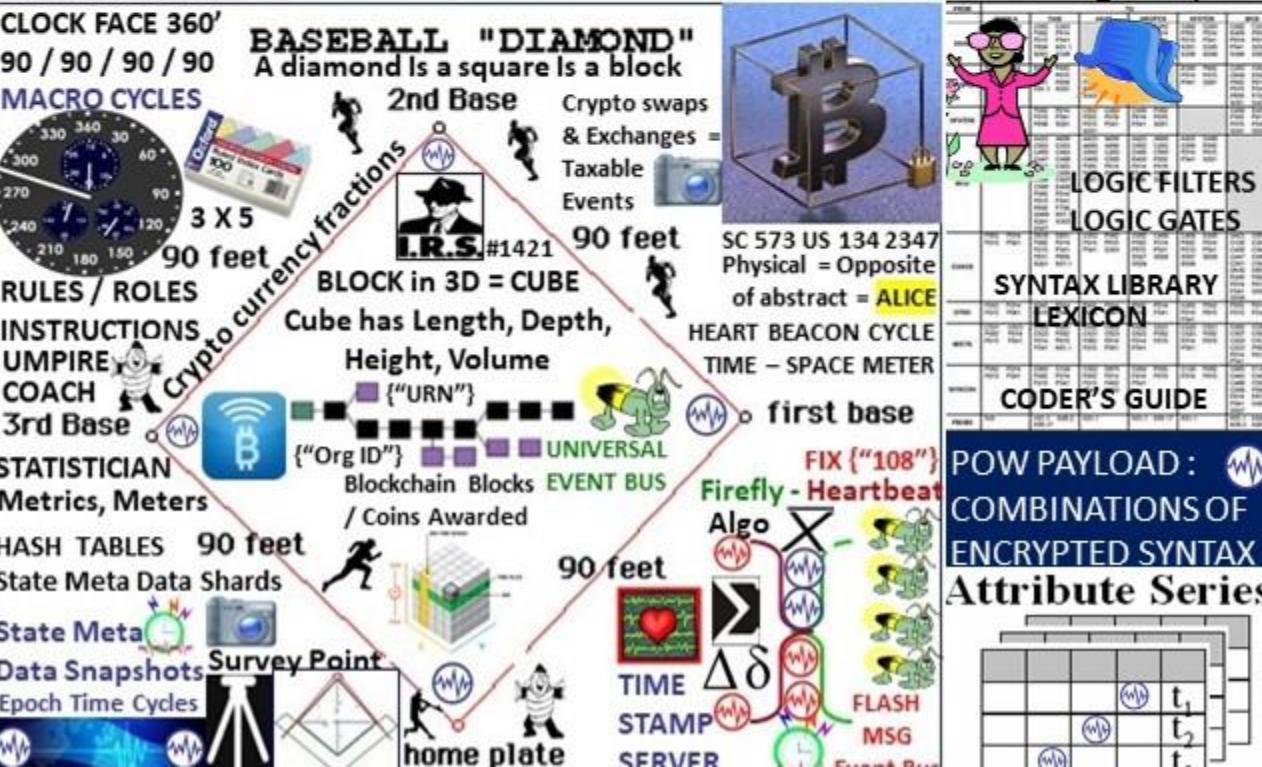
NONCE increments from 0..N until the target is met.



GUESS stores the guess  
Effectively, it begins at infinity.

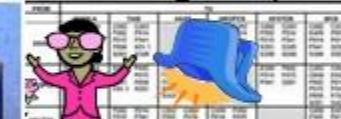


**Proof-of-Work:** users perform some form of work to participate. Work must be difficult for the client but easy for the server/network to verify. POW determines the approximate time between blocks = rate that new bitcoins are created. Work is submitted as a message/timestamp payload with a nonce value.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



MESSAGE ex:  
•Hashing string  
•Hash Table

300+Message Templates

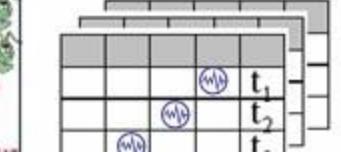


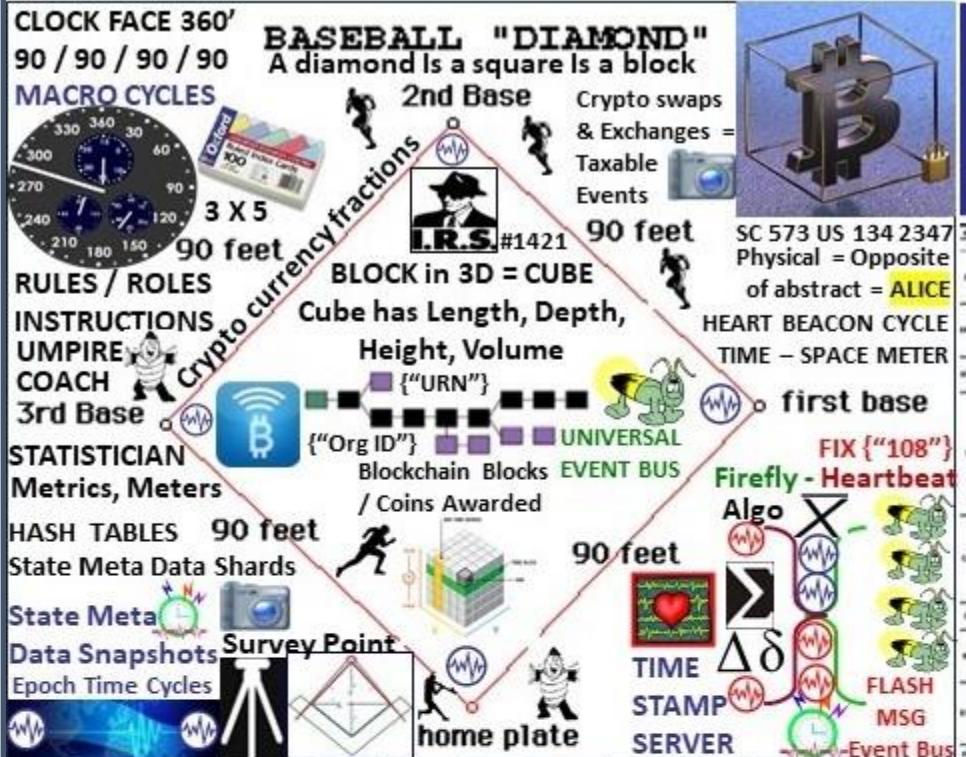
LOGIC FILTERS  
LOGIC GATES

SYNTAX LIBRARY LEXICON

CODER'S GUIDE

POW PAYLOAD:  
COMBINATIONS OF  
ENCRYPTED SYNTAX  
Attribute Series





A collage of various Bitcoin-related concepts and icons. At the top left, there's a diagram titled 'TRANSACTIONS PER CYCLE METRICS' showing a sequence of blue Bitcoin icons with arrows indicating flow between them. To its right is a section titled 'COMPUTER CHIP TIME EPOCHS' showing a sequence of blue Bitcoin icons with arrows labeled 'cycle n', 'n + 1', and 'n + 2'. The center of the collage features a large white box with the text 'PROOF-OF-STAKE' in grey. Below this, on the left, is a black and white illustration of a man wearing a fedora and a mask, with the letters 'I.R.S.' below him. Next to this is a yellow section with the text 'UXTO' and 'Mined Bitcoins' above a blue Bitcoin icon. To the right of this yellow section is an orange section with the text 'Survey Methods' and 'Proximity Beacons' above a green waveform icon. Further right is a section titled 'CALENDAR' with a calendar icon. At the bottom left, there's a section titled 'IRS Memo #1421 Bitcoin purchase' with a green waveform icon. The bottom right features a green circular radar-like icon with a red waveform in the center.

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

**Stake-Time algorithm favors both # of coins held & how often, frequently coins are staked**  
Velocity based selection PoSV encourages velocity  
i.e. coin movement between people Vs hoarding.

**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

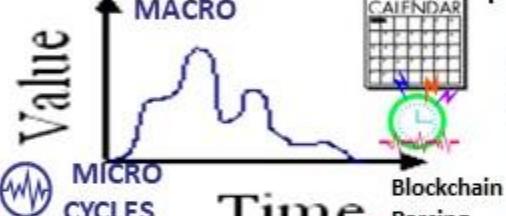
# SAWTOOTH LAKE POETIC CONSENSUS PROOF OF ELAPSED TIME: POET

"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

### Time Series



### Time Series Databases

### QUORUM VOTING PROTOCOL

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

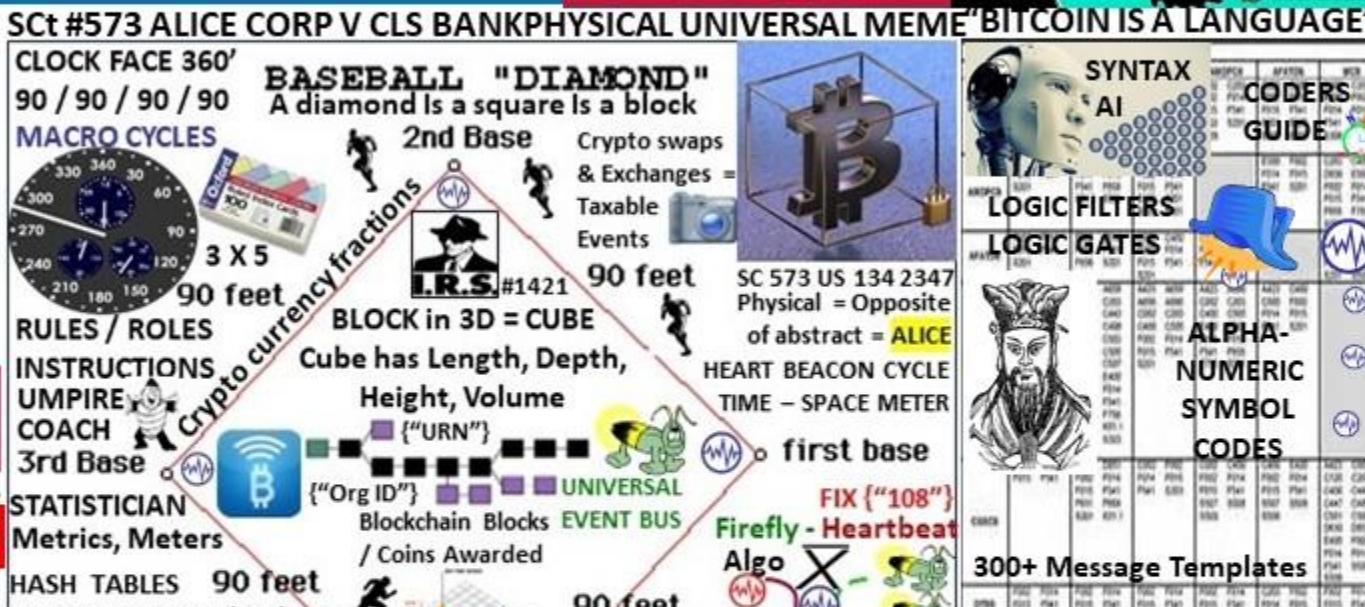
Voting based selection Instead of only using the stake size, the block generators can be selected by votes  
ex: League MVP

MVP



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

### TOURNAMENT LEAGUE BOARD

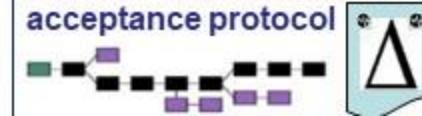


### FIREFLY-HEARTBEAT FLASH MESSAGES UNIVERSAL EVENT BUS



"BITCOIN'S VALUE IS TIME ITSELF – DIGINOMICS"

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



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

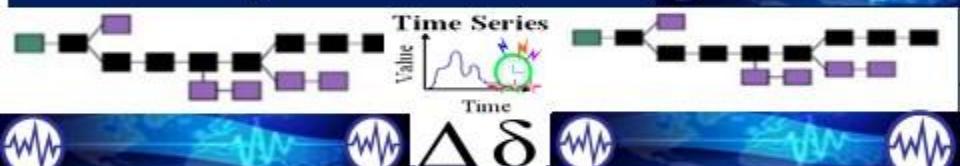
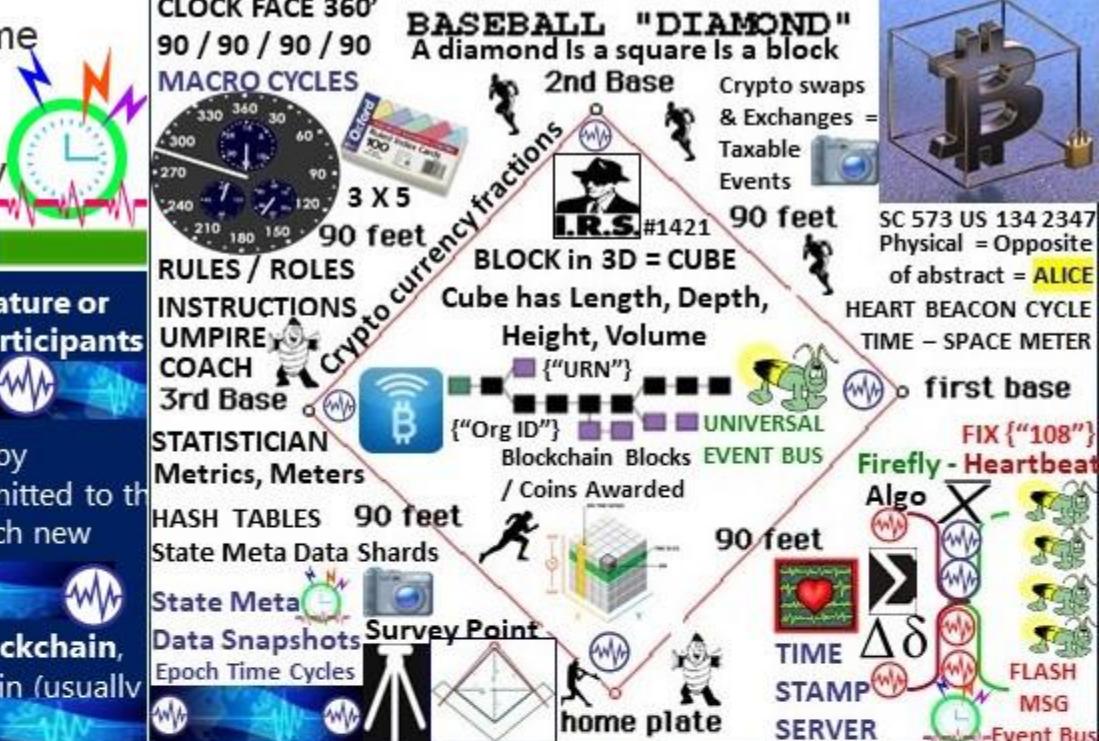
**STATE CHANNELS:** blockchain interactions

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

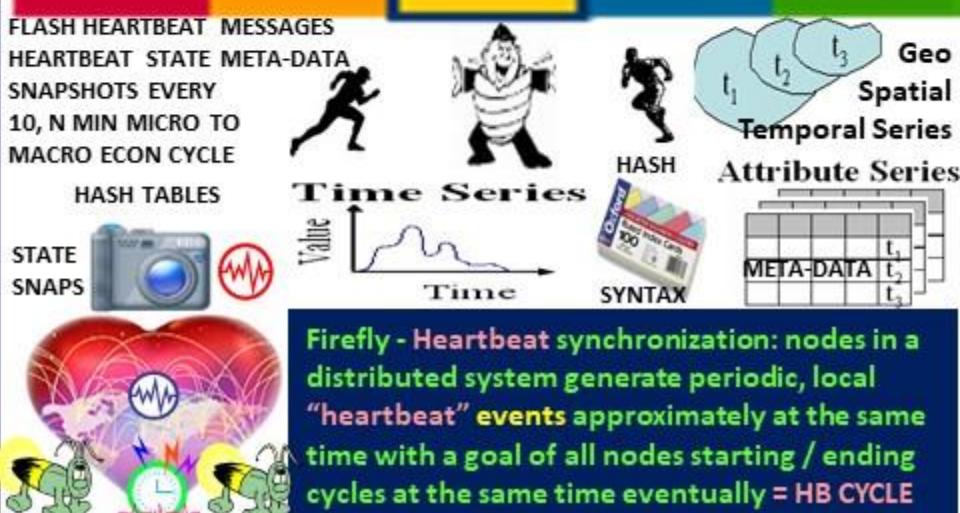
1. Part of the blockchain state is locked via multisignature or smart contract convention, so that a specific set of participants must completely agree with each other to update it.

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 a different configuration than it started with)



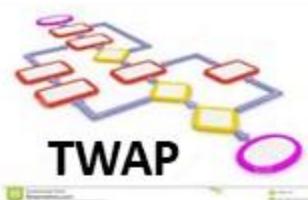
**NEW UPDATES OVERWRITE THE PREVIOUS:** simplest way is to have any unlocking attempt start a timer, during which any newer update can replace the old update (restarting the timer). When the timer completes, the channel is closed and the state adjusted to reflect the last update received. The length 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.



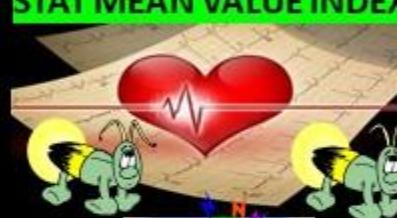
Firefly - Heartbeat synchronization: nodes in a distributed system generate periodic, local "heartbeat" events approximately at the same time with a goal of all nodes starting / ending cycles at the same time eventually = HB CYCLE

# TWAP Algorithm Manages Bitcoin Price Volatility Algorithm

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



FIREFLY HEARTBEAT ALGO  
STAT MEAN VALUE INDEX



STATE META  
DATA SNAPSHOTS



STATE SAMPLE

**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..

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

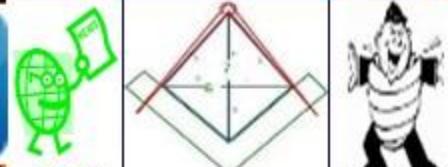
SC ALICE CORP VS CLS BANK: "claims may not direct towards abstract ideas"

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.



Memo #1421: Purchased Bitcoins are treated akin to property

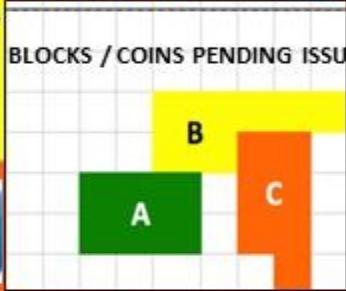
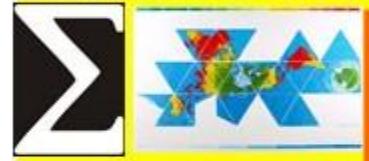
Plots A, B, C represent 3 unspent transaction outputs controlling N Bitcoins



TIME      ROLES      DISTANCE

Meters      Metrics

## Mined Bitcoins



## Unmined Bitcoins



Un-mined coins – think of them as parcels of land on "Bitcoin Island" not yet released:  
IDMaps-SONARHOPS distance estimation query-reply service

- End-state Bitcoin quantity will be fixed like land

"Bitcoin as protocol of ownership, not transfer"

Coin never travel, but simply switch owners"

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

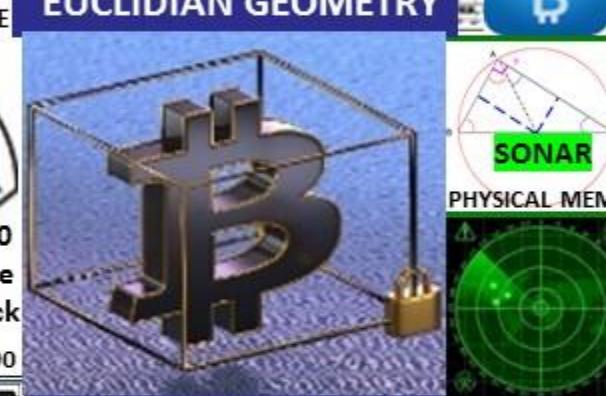
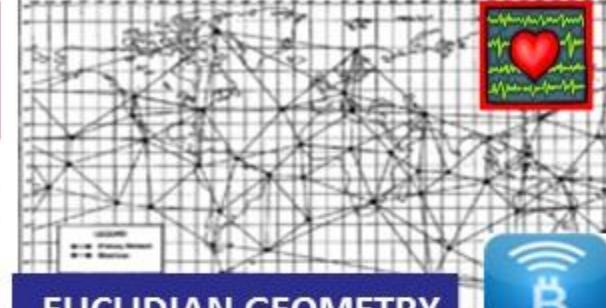
Step 2: coins sent where, when Lat-Long, Time Stamp

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

Step 4: Issuing Org of Record adjudicates w buyer

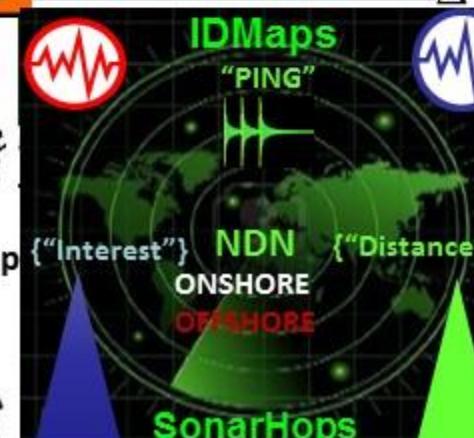


TRIANGULATION



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

HEART BEACON CYCLE

USPTO 13/573,002

SURVEY METHODS



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.

Blocktime Arbitrage MTL (machine trust language) time primitives might be assigned to a micropayment channel DAPP as a time arbiter. In blocktime, the time interval at which things are done is by block. This is the time that it takes blocks to confirm, so blockchain system processes like those involving smart contracts are ordered around the conception of blocktime quanta or units. Since blocktime is an inherent blockchain feature, one of the easiest ways to programmatically specify future time intervals for event conditions and state changes in blockchain-based events is via BLOCKTIME. Universal blocktime source example: a procedure call to NIST or other time oracle.



## Autonomous Device Coordination Framework



Registration

Authentication

Proximity based rules

Consensus based rules

## FEDERATION AGREEMENTS

Contracts

## PROCEDURAL TEMPLATE

Checklists

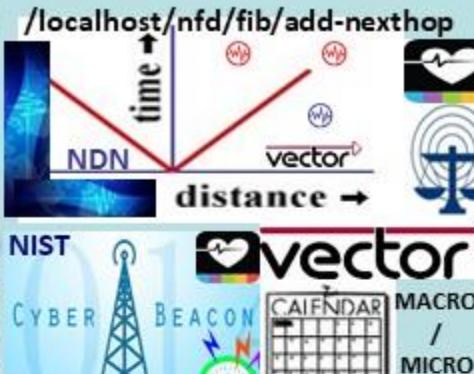
## FEDERATION

<UUID><ORG\_ID><URN>  
LDAP DIRECTORYPhysical proximity  
Social proximity  
Temporal proximity

Agreements

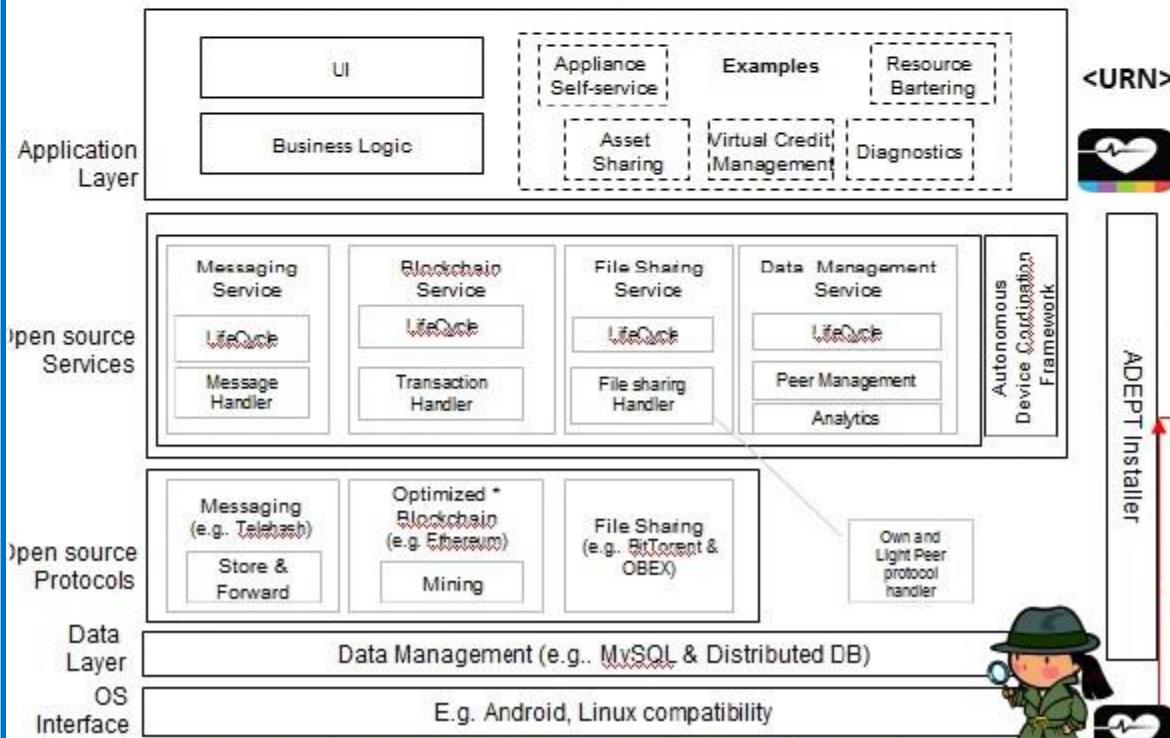
Payments

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



ASSET SHARING WITHIN FEDERATION  
BUSINESS LOGIC = WORKFLOW <XML\_Wf>

FILE SHARING = CYCLIC SYNC DELTA LEDGER / DOCUMENT REFRESH  
 $\Delta\delta$



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"

**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 /

AUTHENTICATION

Entropy

Entanglement

Source

RANDOM  
NUMBER  
GENERATOR

Bell  
Test

NIST time

Crypto-hardening

& Time stamp

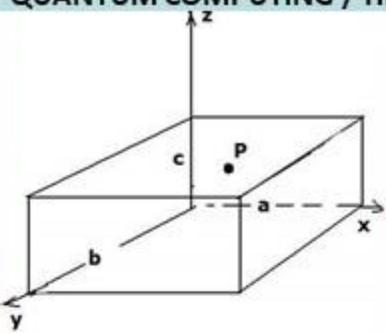
Entropy

PBR Data

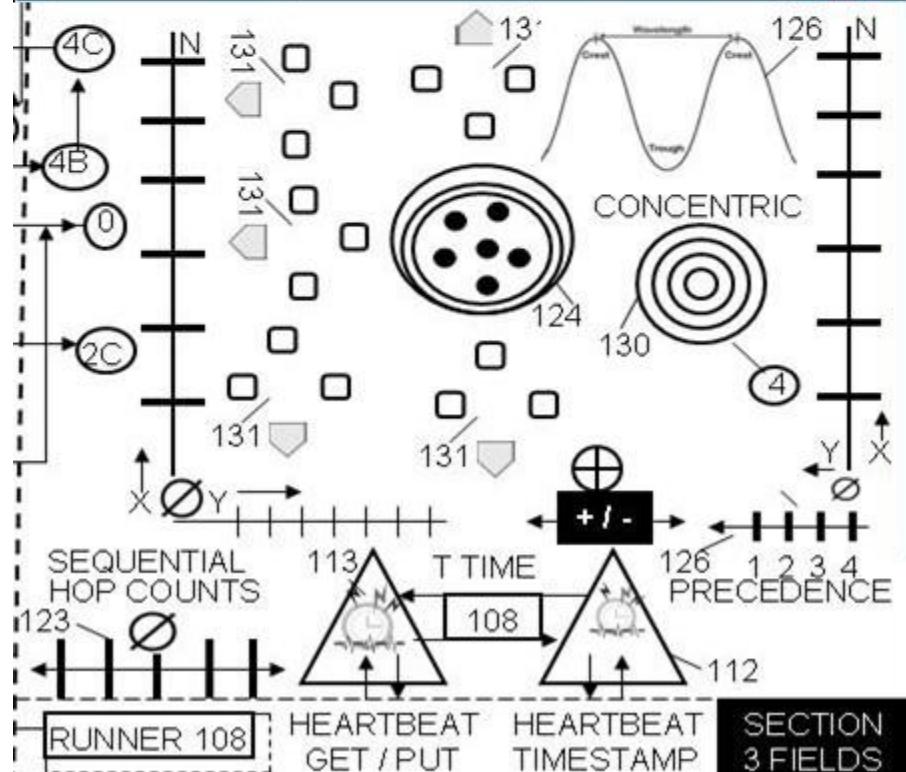
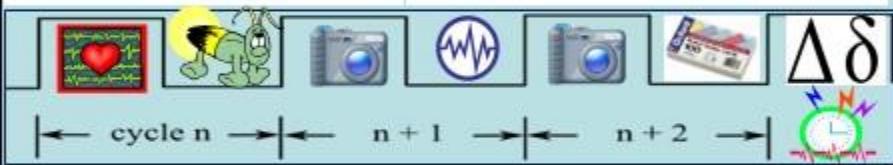
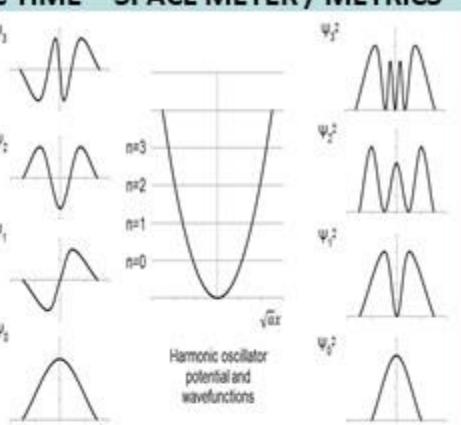
Analysis

Entropy

## QUANTUM COMPUTING / HBC TIME – SPACE METER / METRICS



A particle 'P' in a 3-dimensional box, representing a simple quantum mechanical system.



#QuantumComputing USct Alice Corp Vs CLS Bank compliant memes:  
In quantum computing, a qubit (or quantum bit (sometimes qbit) is a unit of quantum information—the quantum analogue of the classical binary bit. A qubit is a two-state quantum-mechanical system, such as the polarization of a single photon: the two states are vertical polarization and horizontal polarization. In a classical system, a bit has be in one state or the other. Quantum mechanics allows a qubit to be in a superposition of both states at the same time, a fundamental quantum computing property

US Sct Alice Corp Vs CLS Bank Physical memes

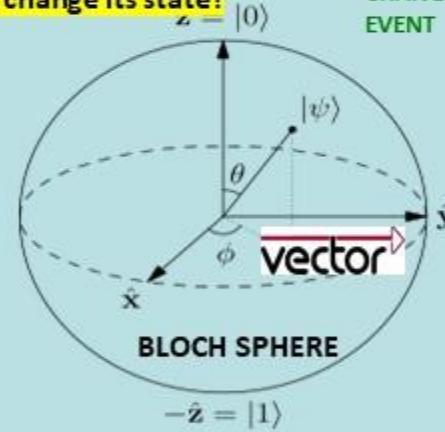
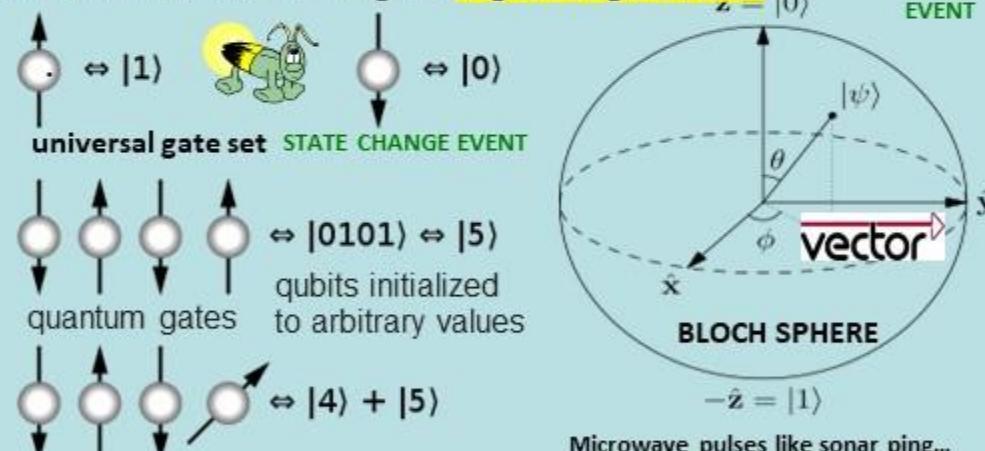


Linear sequential "Paul Revere" meme = horizontal polarization

Vertical polarization vectors from a known point 0 null Sonar Hop meme

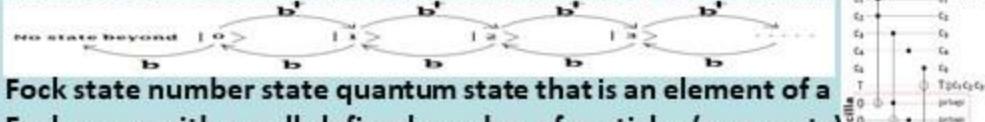


Instead of each bit having two potential states — on or off — a quantum bit or qubit has three. It can be on, off, or both, and you only know which one it is once you look at it. How can you tell if a bit of data is correct if looking at it might change its state?



Microwave pulses like sonar ping...  
 $|00\rangle = \begin{bmatrix} 1 \\ 0 \\ 0 \\ 0 \end{bmatrix}$     $|01\rangle = \begin{bmatrix} 0 \\ 1 \\ 0 \\ 0 \end{bmatrix}$     $|11\rangle = \begin{bmatrix} 0 \\ 0 \\ 0 \\ 1 \end{bmatrix}$

qubits can be in a superposition of all the clasically allowed states  
**silicon device movement is controlled through use of microwave pulses. As an electron spins up, a binary value of 1 is generated, when the electron spins down, a binary value of 0 is generated.**



Fock state number state quantum state that is an element of a Fock space with a well-defined number of particles (or quanta)



