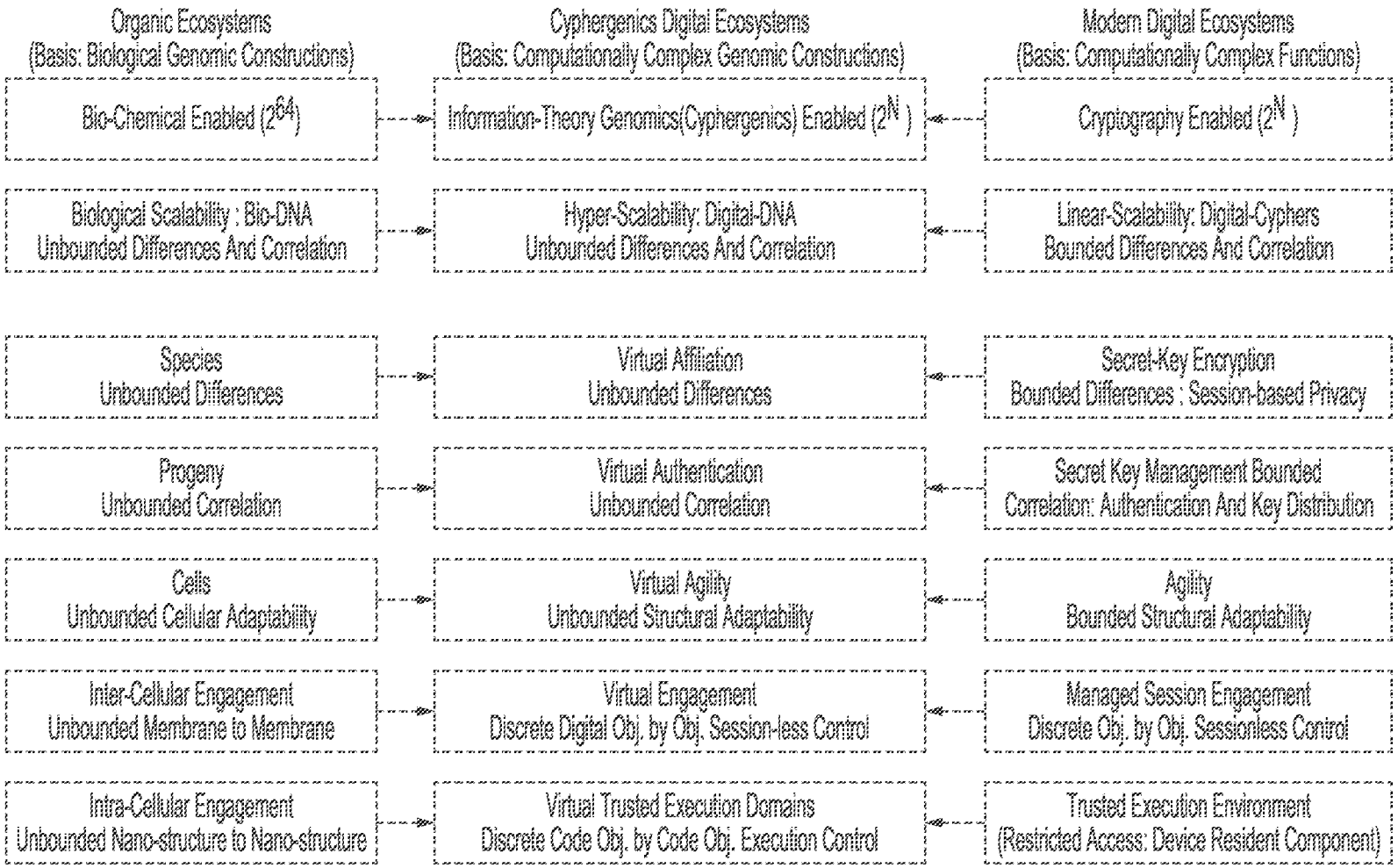

Organic Ecosystems
(Basis: Biological Genomic Constructions)
Cyphergenics Digital Ecosystems
(Basis: Computationally Complex Genomic Constructions)
Modern Digital Ecosystems
(Basis: Computationally Complex Functions)
Bio-Chemical Enabled (2^{64})
Information-Theory Genomics(Cyphergenics) Enabled (2^{N})
Cryptography Enabled (2^{N})
Biological Scalability : Bio-DNA
Unbounded Differences And Correlation
Hyper-Scalability: Digital-DNA
Unbounded Differences And Correlation
Linear-Scalability: Digital-Cyphers
Bounded Differences And Correlation
Species
Unbounded Differences
Virtual Affiliation
Unbounded Differences
Secret-Key Encryption
Bounded Differences : Session-based Privacy
Progeny
Unbounded Correlation
Virtual Authentication
Unbounded Correlation
Secret Key Management Bounded
Correlation: Authentication And Key Distribution
Cells
Unbounded Cellular Adaptability
Virtual Agility
Unbounded Structural Adaptability
Agility
Bounded Structural Adaptability
Inter-Cellular Engagement
Unbounded Membrane to Membrane
Virtual Engagement
Discrete Digital Obj. by Obj. Session-less Control
Managed Session Engagement
Discrete Obj. by Obj. Sessionless Control
Intra-Cellular Engagement
Unbounded Nano-structure to Nano-structure
Virtual Trusted Execution Domains
Discrete Code Obj. by Code Obj. Execution Control
Trusted Execution Environment
(Restricted Access: Device Resident Component)

FIG. 1

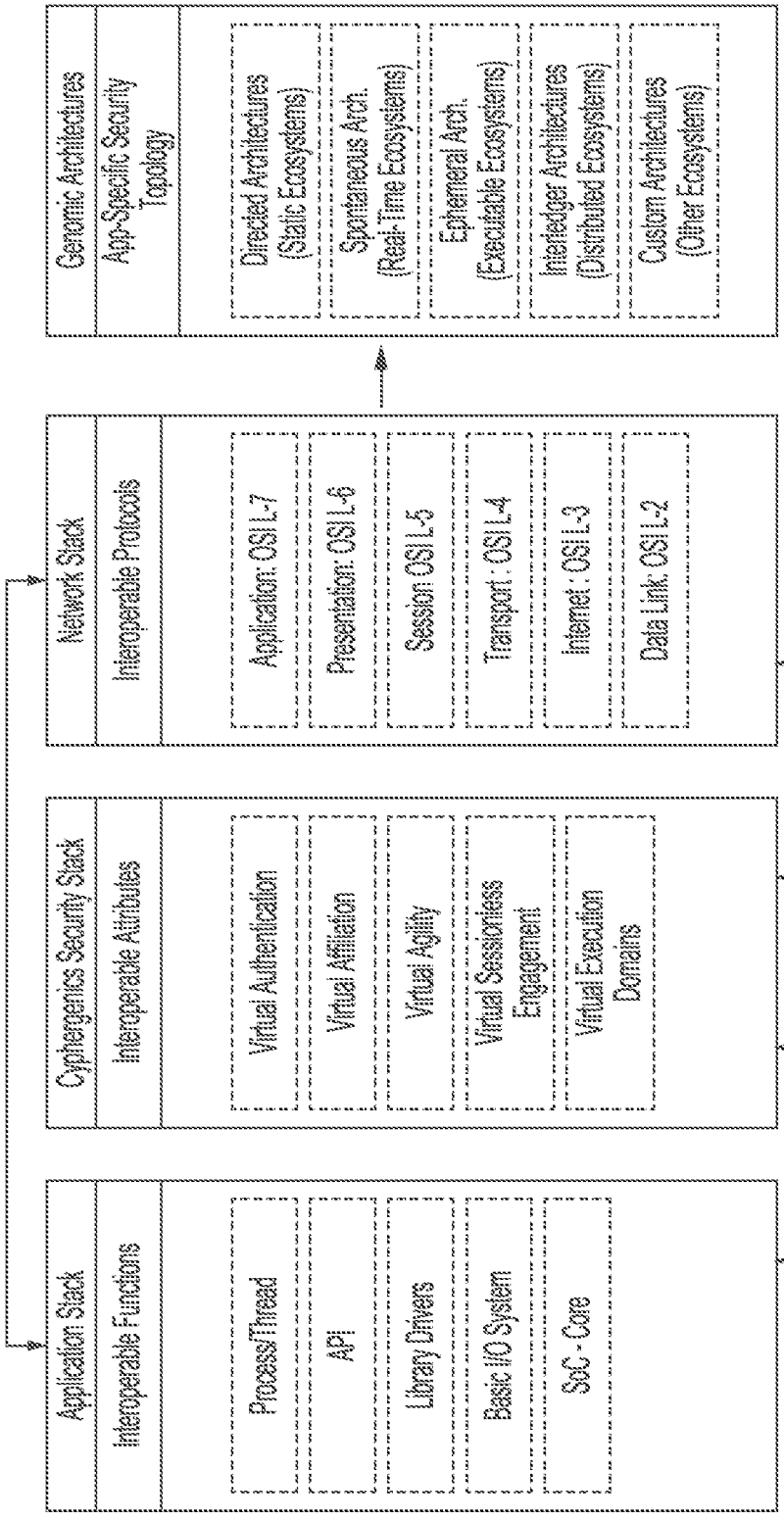

Application Stack
Interoperable Functions
Process/Thread
API
Library Drivers
Basic I/O System
SoC - Core
Cyphergenics Security Stack
Interoperable Attributes
Virtual Authentication
Virtual Affiliation
Virtual Agility
Virtual Sessionless Engagement
Virtual Execution Domains
Network Stack
Interoperable Protocols
Application: OSI L-7
Presentation: OSI L-6
Session OSI L-5
Transport : OSI L-4
Internet : OSI L-3
Data Link. OSI L-2
Genomic Architectures
App-Specific Security Topology
Directed Architectures (Static Ecosystems)
Spontaneous Arch. (Real-Time Ecosystems)
Ephemeral Arch. (Executable Ecosystems)
Interledger Architectures (Distributed Ecosystems)
Custom Architectures (Other Ecosystems)

FIG. 2

CYPHERGENICS (CG): TECHNOLOGY ENABLES COMPREHENSIVE POST QUANTUM SECURITY:

	PKI : POST QUANTUM	*QKD : POST QUANTUM*	*CYPHERGENICS : POST QUANTUM*
SECURITY COHORT ID ATTRIBUTES			
Authentication : Facilitation	**Trusted Third Party**	**Trusted Third Party**	*Digital-Cohort to Digital-Cohort*
Non-Repudiation : Facilitation	**Trusted Third Party**	**Trusted Third Party**	*Digital-Cohort to Digital-Cohort*
Integrity : Facilitation	*Message*	*Message*	*Digital Object by Digital Object*
SECURITY TECHNOLOGY ATTRIBUTES			
Key Mgmt. : Basis	*Under Development*	*Quantum Phenomena*	*Virtual Binary Language Script (VBLS)*
Encryption : Basis	*Under Development*	*Quantum Phenomena*	*Virtual Binary Language Script (VBLS)*
Engagement : Scalability	**One to Many**	**One to One**	*Many to Many*
SECURITY APPLICATION ATTRIBUTES			
Domain	*Network*	**Optical Communications Networks**	*Global Digital Ecosystems*
Function	*Data Transport*	*Data Transport*	*Security-Instance by Security-Instances*
Engagement	*Device to Device*	**Photon Detector to Photon Detector**	*Digital-Cohort to Digital-Cohort*
Primary Application	*Session Managed Engagement*	*Session Managed Engagement*	*Security Architecture Generation*
SECURITY ENGAGEMENT ATTRIBUTES			
Session Coordination	**Per Engagement**	**Per Engagement**	*Obsoleted by VBLS*
Secret Key Generation	*Per Engagement*	*Per Engagement*	*Obsoleted by VBLS*
Secret Key Exchange	**Per Engagement**	**Per Engagement**	*Obsoleted by VBLS*
Secret Key Retention	*Per Engagement*	*Per Engagement*	*Obsoleted by VBLS*

FIG. 3

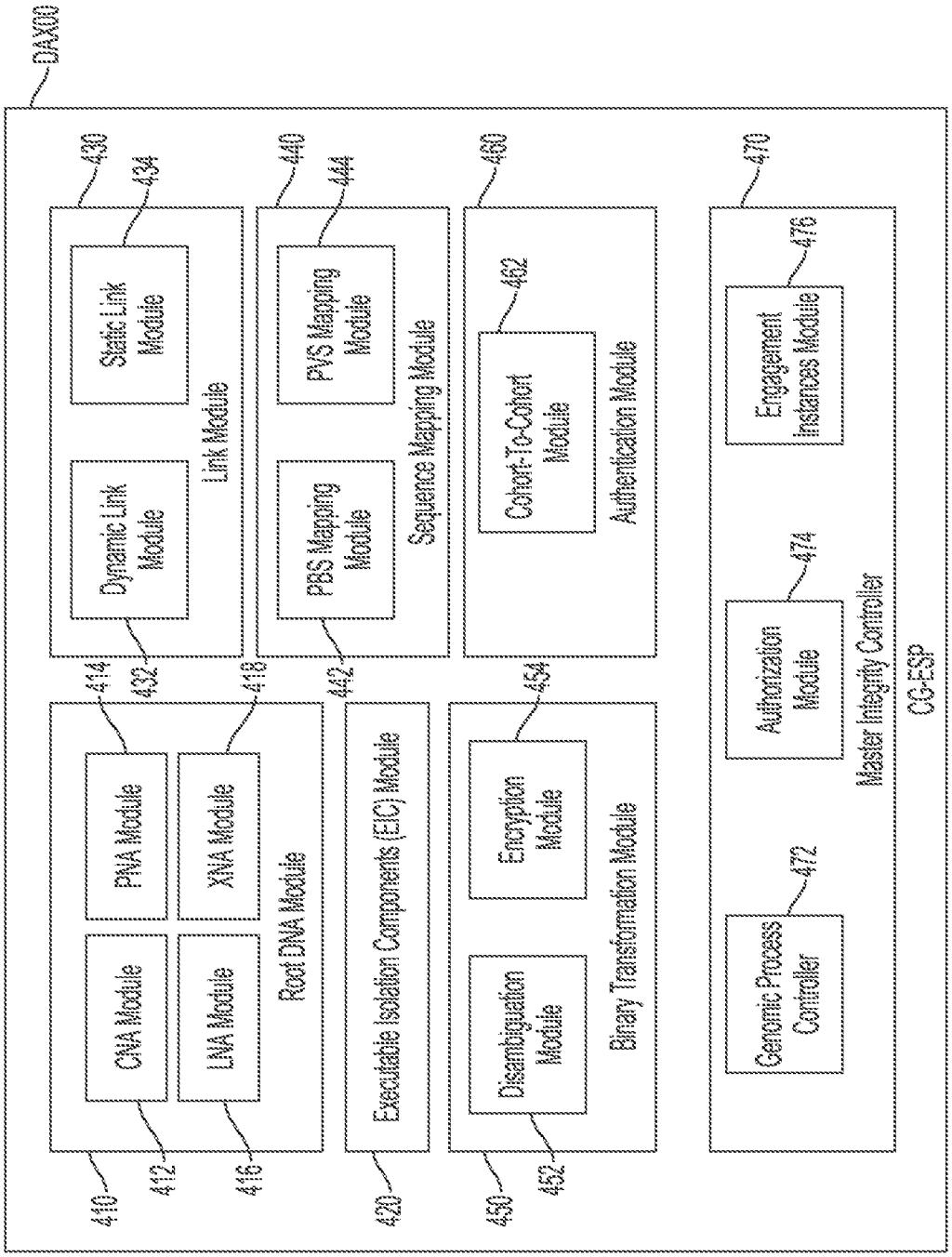

DAX00
410
CNA Module
412
LNA Module
416
PNA Module
414
XNA Module
418
Root DNA Module
420
Executable Isolation Components (EIC) Module
450
Disambiguation Module
452
Encryption Module
454
Binary Transformation Module
430
Dynamic Link Module
432
Static Link Module
434
Link Module
440
PBS Mapping Module
442
PVS Mapping Module
444
Sequence Mapping Module
460
Cohort-To-Cohort Module
462
Authentication Module
470
Genomic Process Controller
472
Authorization Module
474
Engagement Instances Module
476
Master Integrity Controller
CG-ESP

FIG. 4

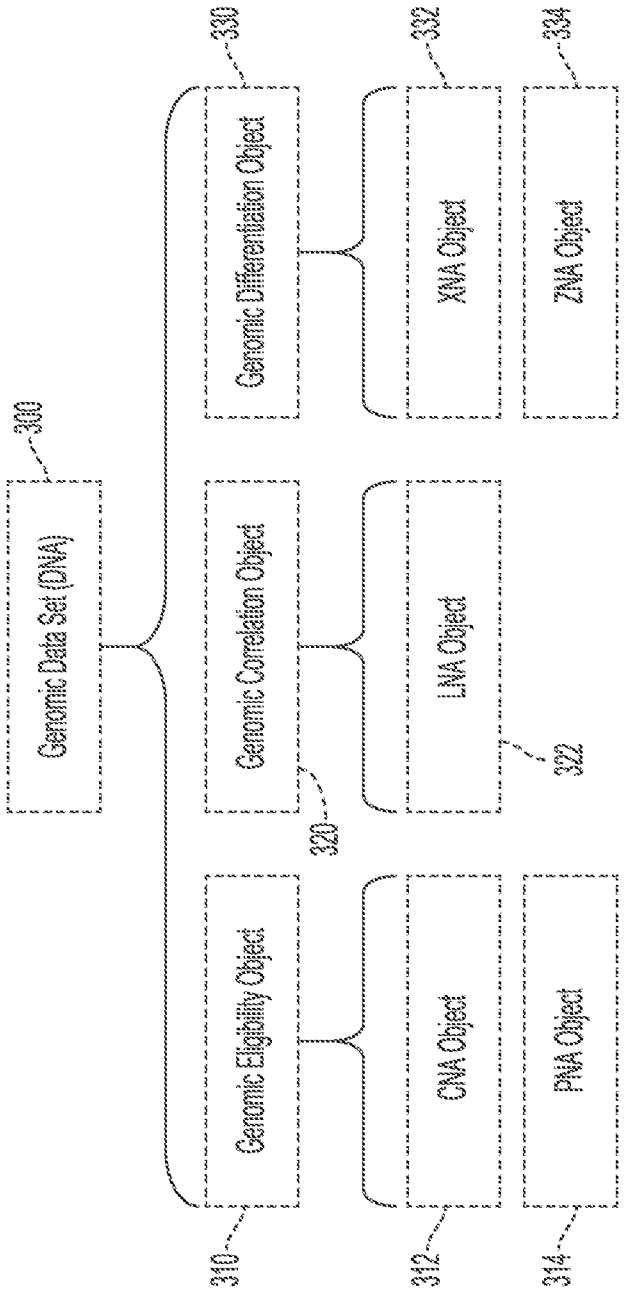

300
Genomic Data Set (DNA)
310
Genomic Eligibility Object
312
CNA Object
314
PNA Object
320
Genomic Correlation Object
322
LNA Object
330
Genomic Differentiation Object
332
XNA Object
334
ZNA Object

FIG. 5

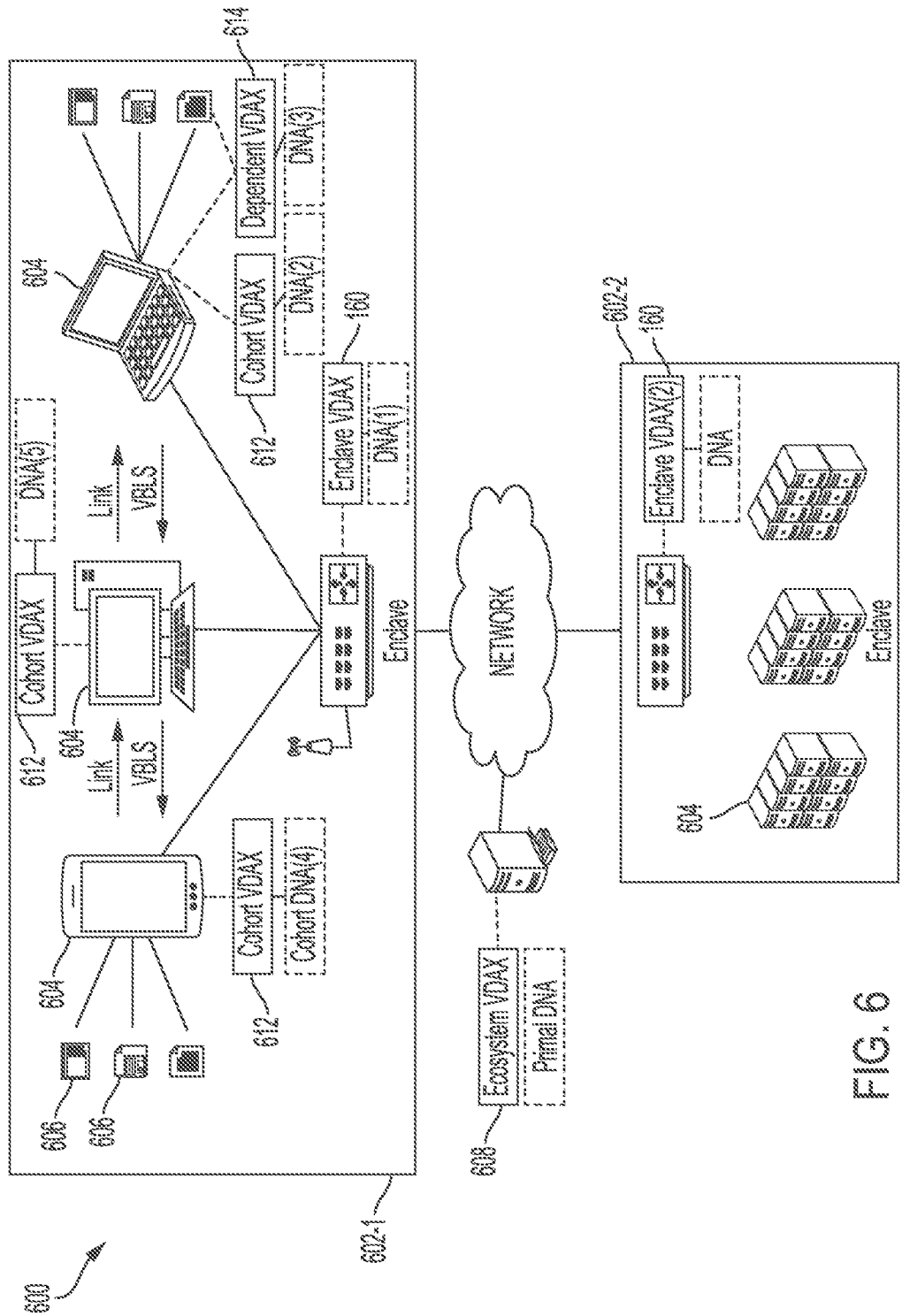

600
602-1
602-2
604
606
608
612
614
160
Cohort VDAX
Cohort DNA(4)
Cohort VDAX
DNA(5)
Dependent VDAX
DNA(3)
Cohort VDAX
DNA(2)
Enclave VDAX
DNA(1)
Enclave VDAX(2)
DNA
Ecosystem VDAX
Primal DNA
Link
VBLS
Enclave
NETWORK

FIG. 6

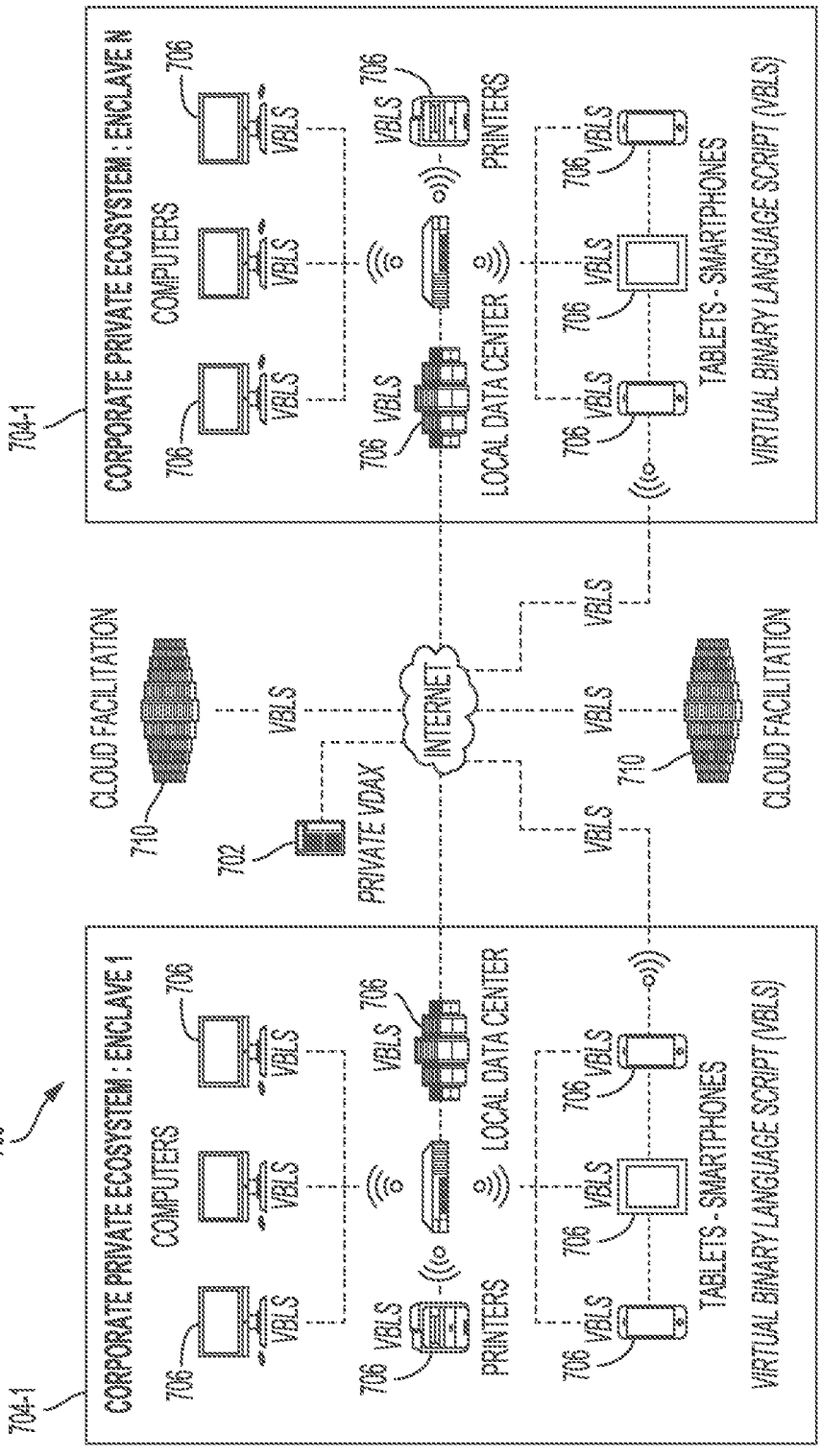

DIRECTED (STATIC ECOSYSTEMS) ARCHITECTURE
700
704-1
CORPORATE PRIVATE ECOSYSTEM ; ENCLAVE 1
COMPUTERS
706
VBLS
PRINTERS
LOCAL DATA CENTER
TABLETS - SMARTPHONES
VIRTUAL BINARY LANGUAGE SCRIPT (VBLS)
CLOUD FACILITATION
710
PRIVATE VDAX
702
INTERNET
CORPORATE PRIVATE ECOSYSTEM ; ENCLAVE N

FIG. 7

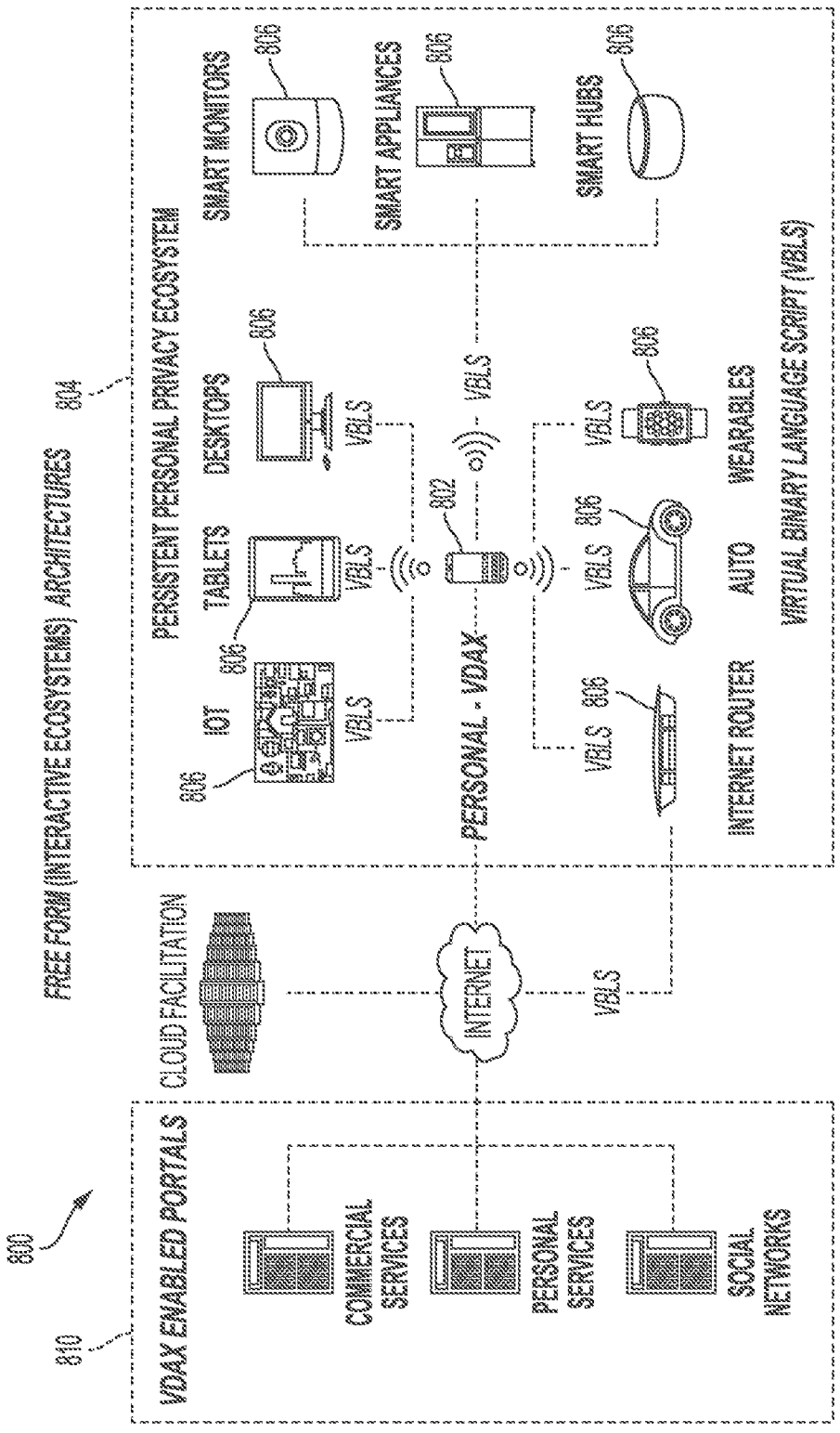

800
FREE FORM (INTERACTIVE ECOSYSTEMS) ARCHITECTURES
804
810
VDAX ENABLED PORTALS
COMMERCIAL SERVICES
PERSONAL SERVICES
SOCIAL NETWORKS
CLOUD FACILITATION
INTERNET
VBLS
PERSISTENT PERSONAL PRIVACY ECOSYSTEM
SMART MONITORS
SMART APPLIANCES
SMART HUBS
DESKTOPS
TABLETS
IOT
806
802
PERSONAL - VDAX
INTERNET ROUTER
AUTO
WEARABLES
VIRTUAL BINARY LANGUAGE SCRIPT (VBLS)

FIG. 8

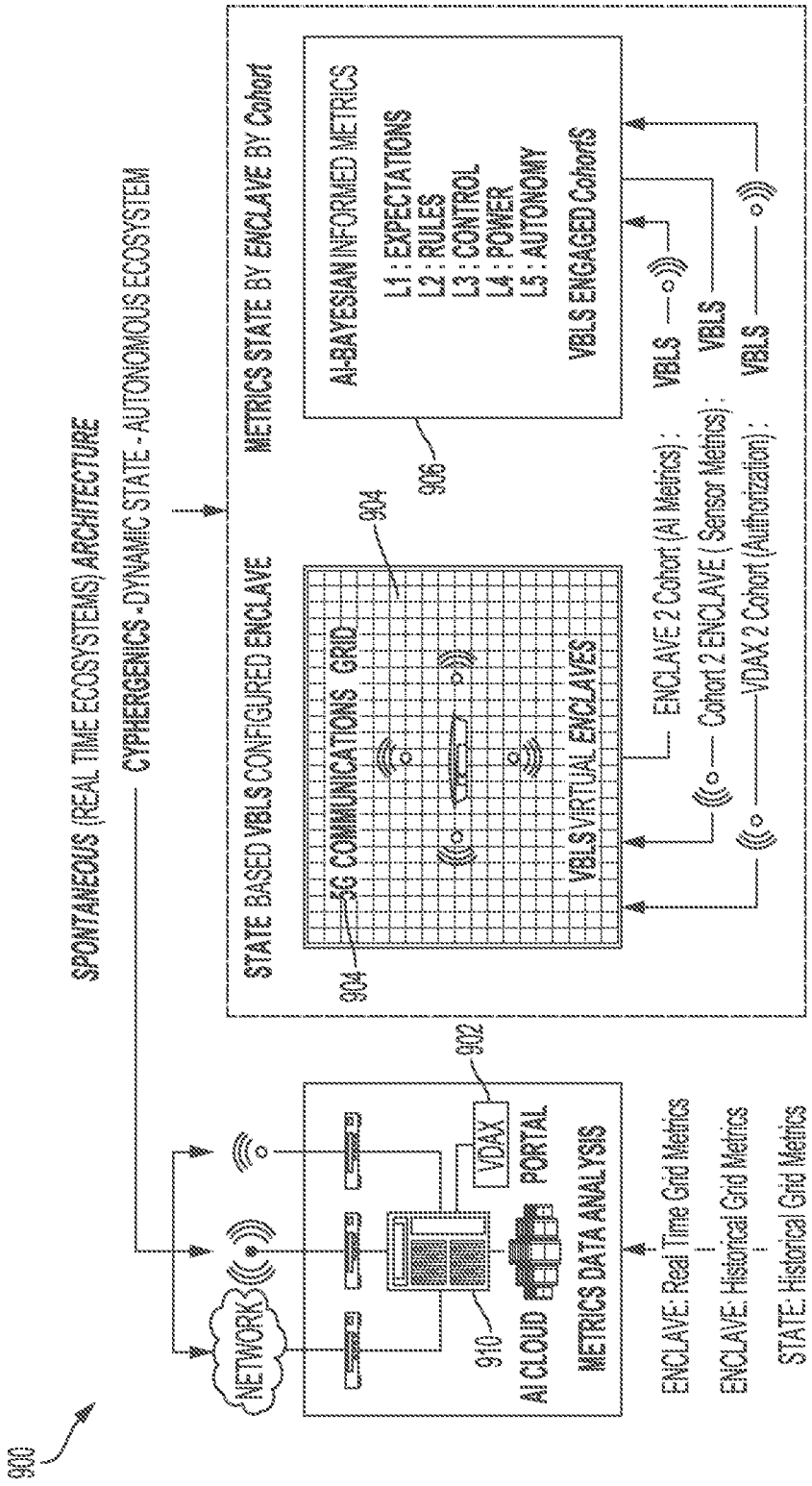

900
SPONTANEOUS (REAL TIME ECOSYSTEMS) ARCHITECTURE
CYPHERGENICS - DYNAMIC STATE - AUTONOMOUS ECOSYSTEM
STATE BASED VBLS CONFIGURED ENCLAVE
METRICS STATE BY ENCLAVE BY Cohort
AI-BAYESIAN INFORMED METRICS
L1 : EXPECTATIONS
L2 : RULES
L3 : CONTROL
L4 : POWER
L5 : AUTONOMY
VBLS ENGAGED CohortS
906
5G COMMUNICATIONS GRID
904
904
VBLS VIRTUAL ENCLAVES
ENCLAVE 2 Cohort (AI Metrics) :
Cohort 2 ENCLAVE (Sensor Metrics) :
VDAX 2 Cohort (Authorization) :
VBLS
VBLS
VBLS
NETWORK
902
VDAX
PORTAL
910
AI CLOUD
METRICS DATA ANALYSIS
ENCLAVE: Real Time Grid Metrics
ENCLAVE: Historical Grid Metrics
STATE: Historical Grid Metrics

FIG. 9

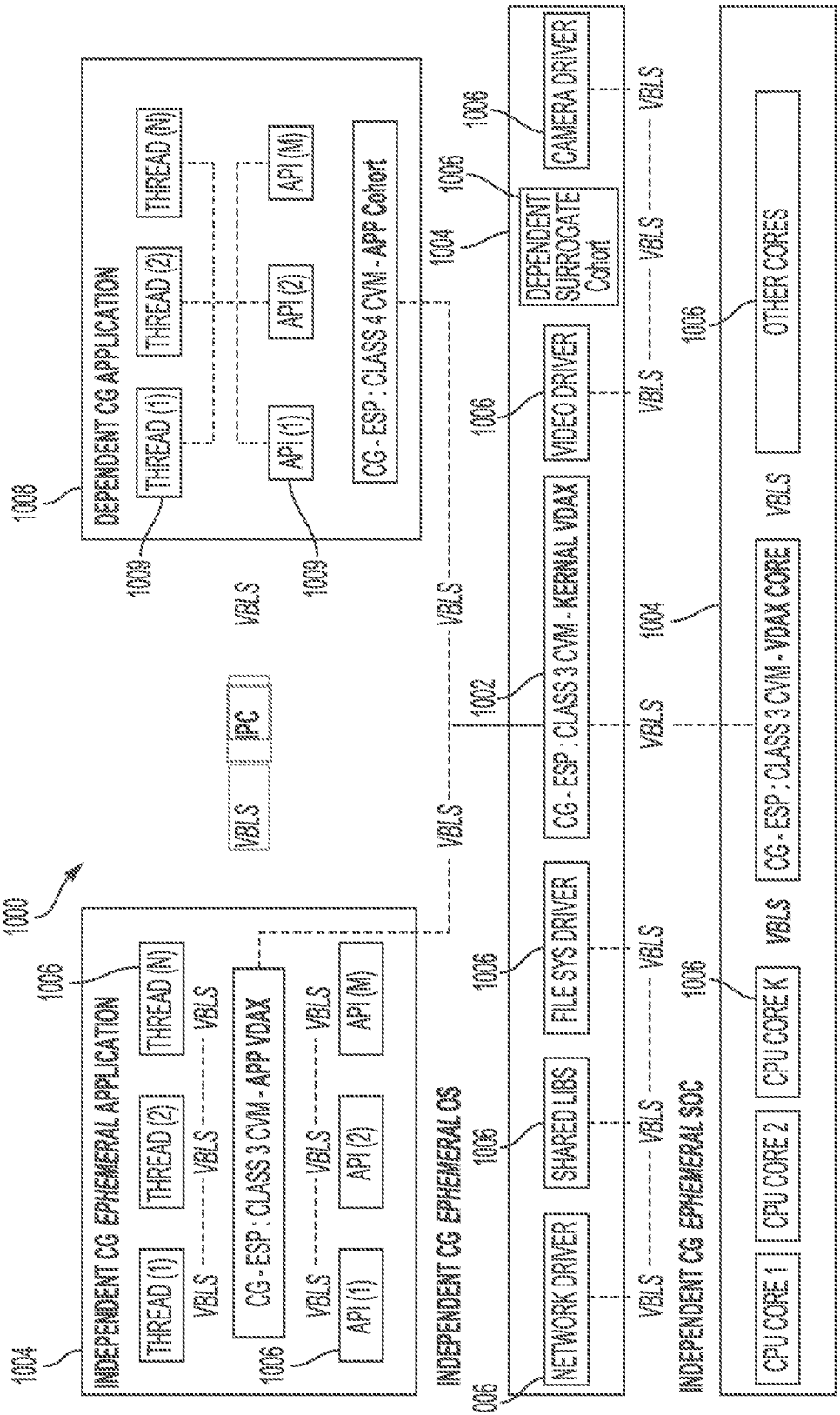

1000
1004
INDEPENDENT CG EPHEMERAL APPLICATION
1006
THREAD (1)
THREAD (2)
THREAD (N)
VBLS
CG - ESP : CLASS 3 CVM - APP VDAX
API (1)
API (2)
API (M)
1008
DEPENDENT CG APPLICATION
1009
IPC
CG - ESP : CLASS 4 CVM - APP Cohort
DEPENDENT SURROGATE Cohort
INDEPENDENT CG EPHEMERAL OS
1002
CG - ESP : CLASS 3 CVM - KERNAL VDAX
NETWORK DRIVER
SHARED LIBS
FILE SYS DRIVER
VIDEO DRIVER
CAMERA DRIVER
INDEPENDENT CG EPHEMERAL SOC
CPU CORE 1
CPU CORE 2
CPU CORE K
CG - ESP : CLASS 3 CVM - VDAX CORE
OTHER CORES

FIG. 10

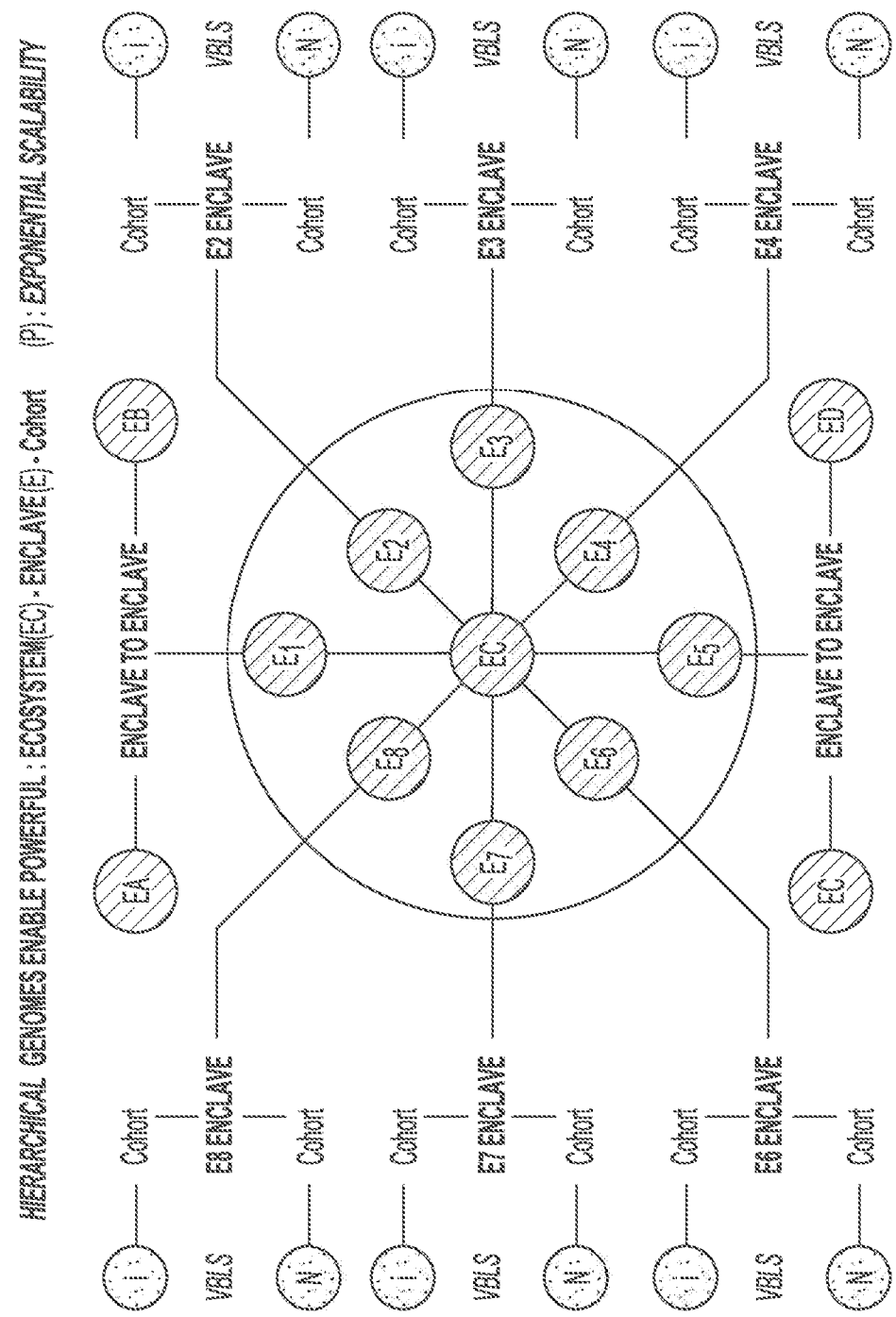

HIERARCHICAL GENOMES ENABLE POWERFUL : ECOSYSTEM(EC) - ENCLAVE (E) - Cohort (P) : EXPONENTIAL SCALABILITY
E1
E2
E3
E4
E5
E6
E7
E8
EC
EA
EB
EC
ED
ENCLAVE TO ENCLAVE
ENCLAVE TO ENCLAVE
E8 ENCLAVE
E2 ENCLAVE
E3 ENCLAVE
E4 ENCLAVE
E7 ENCLAVE
E6 ENCLAVE
Cohort
VBLS
1
N

FIG. 11

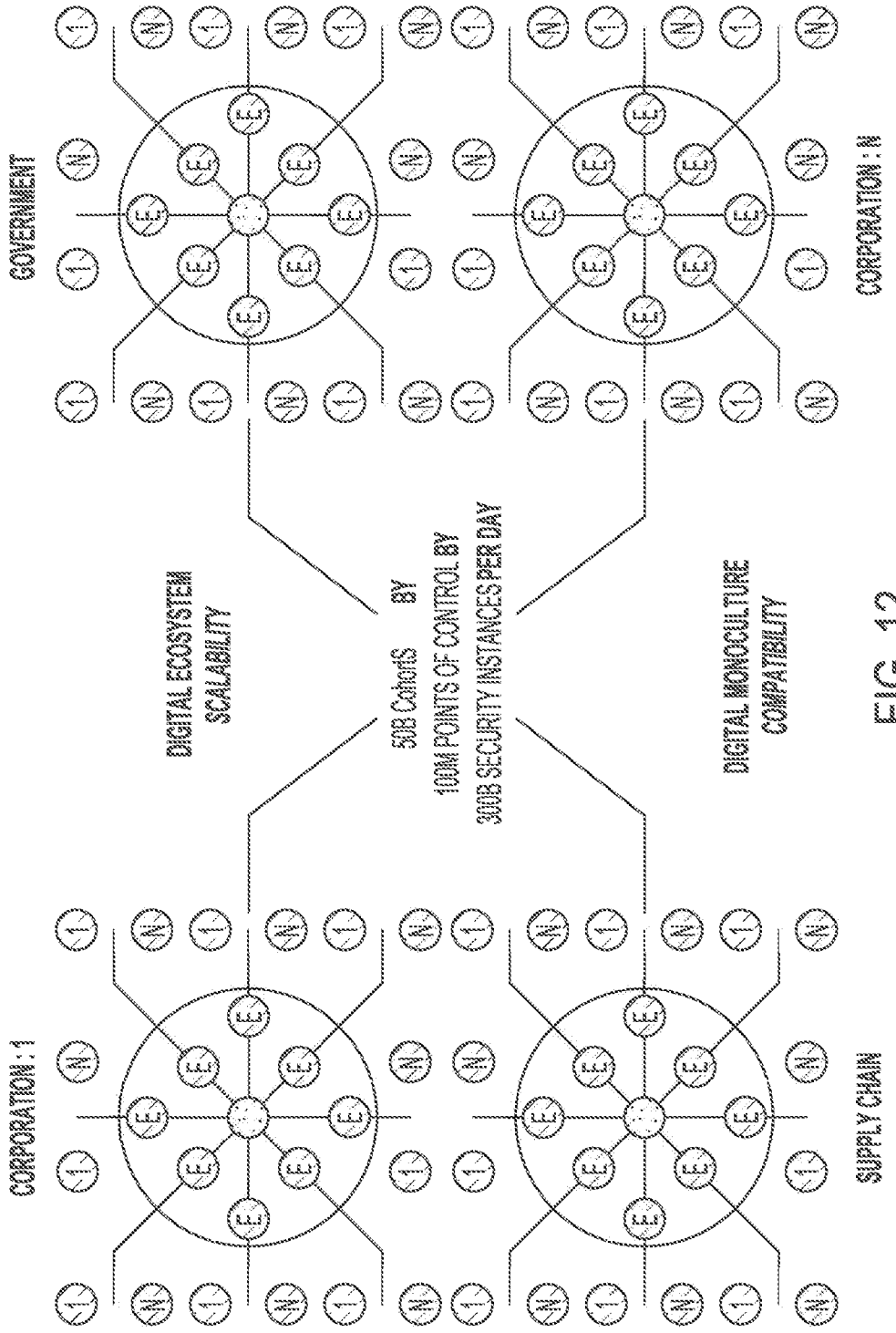

GOVERNMENT
CORPORATION : 1
CORPORATION : N
SUPPLY CHAIN
DIGITAL ECOSYSTEM
SCALABILITY
DIGITAL MONOCULTURE
COMPATIBILITY
50B CohortS BY
100M POINTS OF CONTROL BY
300B SECURITY INSTANCES PER DAY

FIG. 12

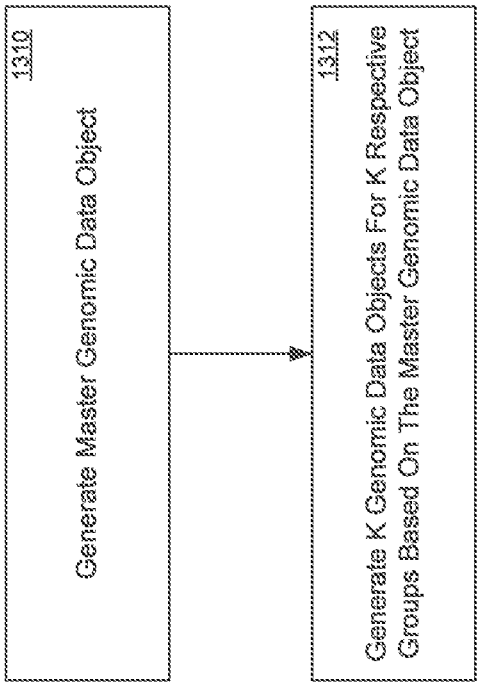

1310
Generate Master Genomic Data Object
1312
Generate K Genomic Data Objects For K Respective Groups Based On The Master Genomic Data Object

FIG. 13

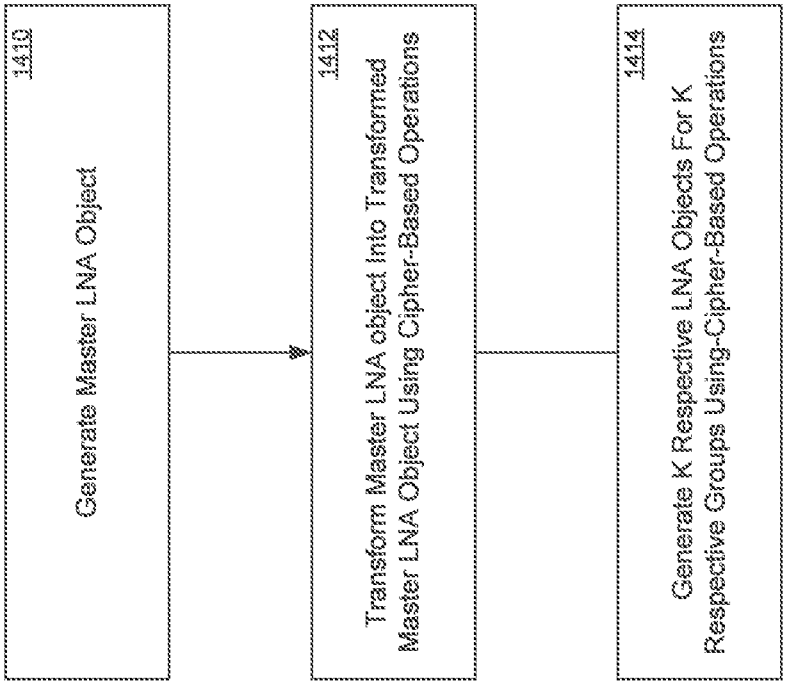

1410
Generate Master LNA Object
1412
Transform Master LNA object Into Transformed Master LNA Object Using Cipher-Based Operations
1414
Generate K Respective LNA Objects For K Respective Groups Using-Cipher-Based Operations

FIG. 14

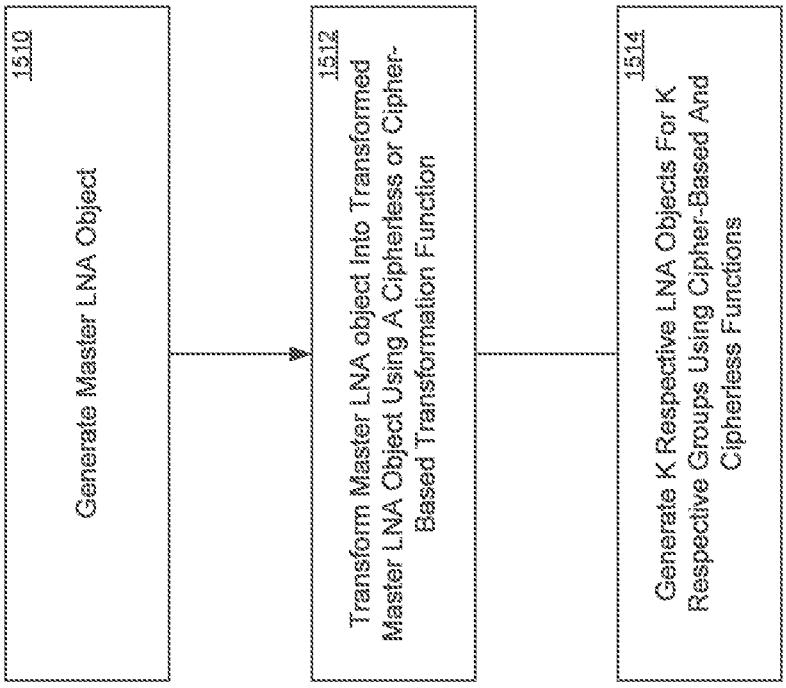

1510
Generate Master LNA Object
1512
Transform Master LNA object Into Transformed Master LNA Object Using A Cipherless or Cipher-Based Transformation Function
1514
Generate K Respective LNA Objects For K Respective Groups Using Cipher-Based And Cipherless Functions

FIG. 15

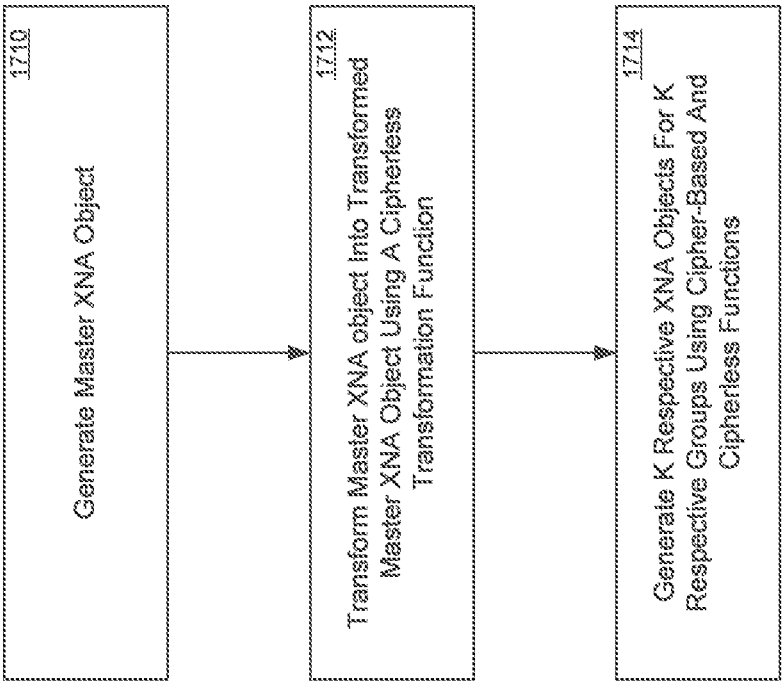

1710
Generate Master XNA Object
1712
Transform Master XNA object Into Transformed Master XNA Object Using A Cipherless Transformation Function
1714
Generate K Respective XNA Objects For K Respective Groups Using Cipher-Based And Cipherless Functions

FIG. 17

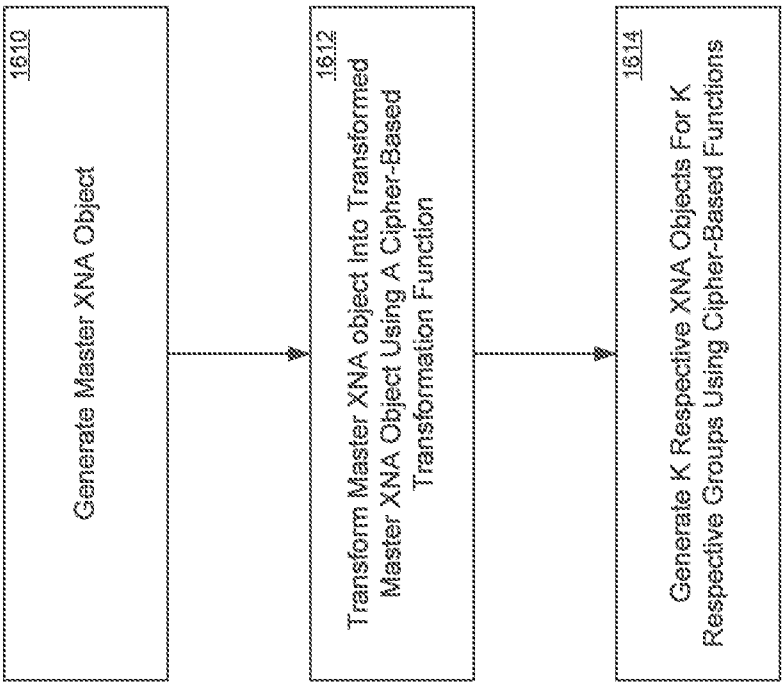

1610
Generate Master XNA Object
1612
Transform Master XNA object Into Transformed Master XNA Object Using A Cipher-Based Transformation Function
1614
Generate K Respective XNA Objects For K Respective Groups Using Cipher-Based Functions

FIG. 16

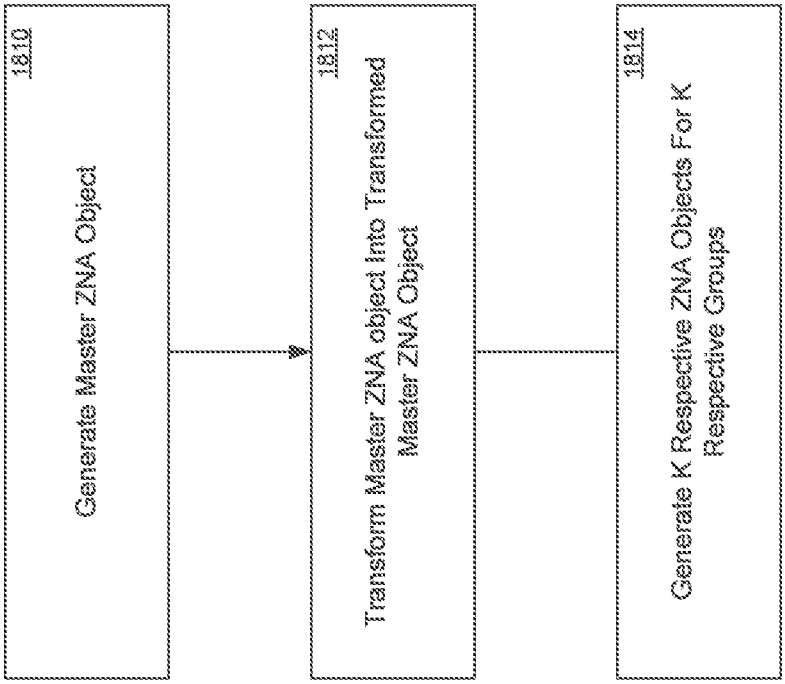

1810
Generate Master ZNA Object
1812
Transform Master ZNA object Into Transformed Master ZNA Object
1814
Generate K Respective ZNA Objects For K Respective Groups

FIG. 18

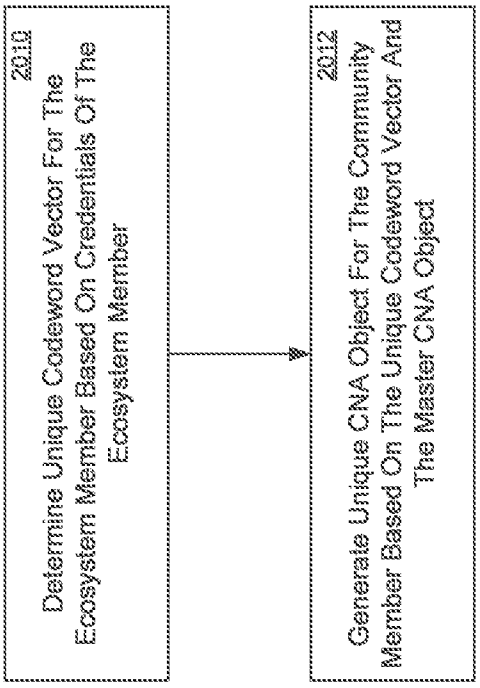

1910
Generate Master CNA Object
1912
Generate A Respective CNA Object For Respective Community Member Based On The Master CNA Object And Credentials Of The Respective Community Member

FIG. 19

2010
Determine Unique Codeword Vector For The Ecosystem Member Based On Credentials Of The Ecosystem Member
2012
Generate Unique CNA Object For The Community Member Based On The Unique Codeword Vector And The Master CNA Object

FIG. 20

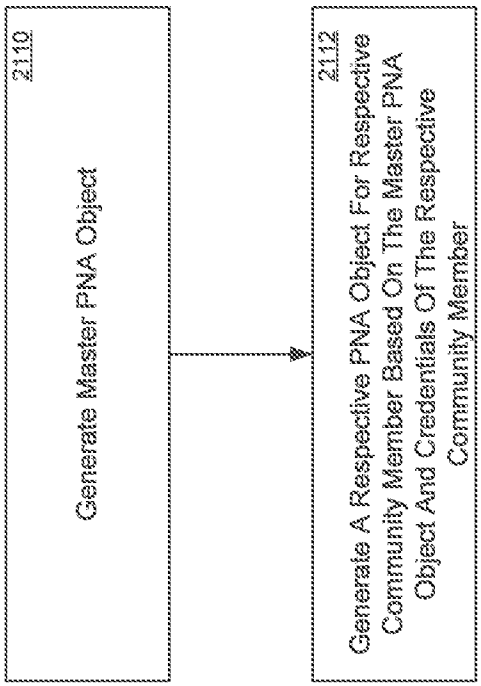

2110
Generate Master PNA Object
2112
Generate A Respective PNA Object For Respective Community Member Based On The Master PNA Object And Credentials Of The Respective Community Member

FIG. 21

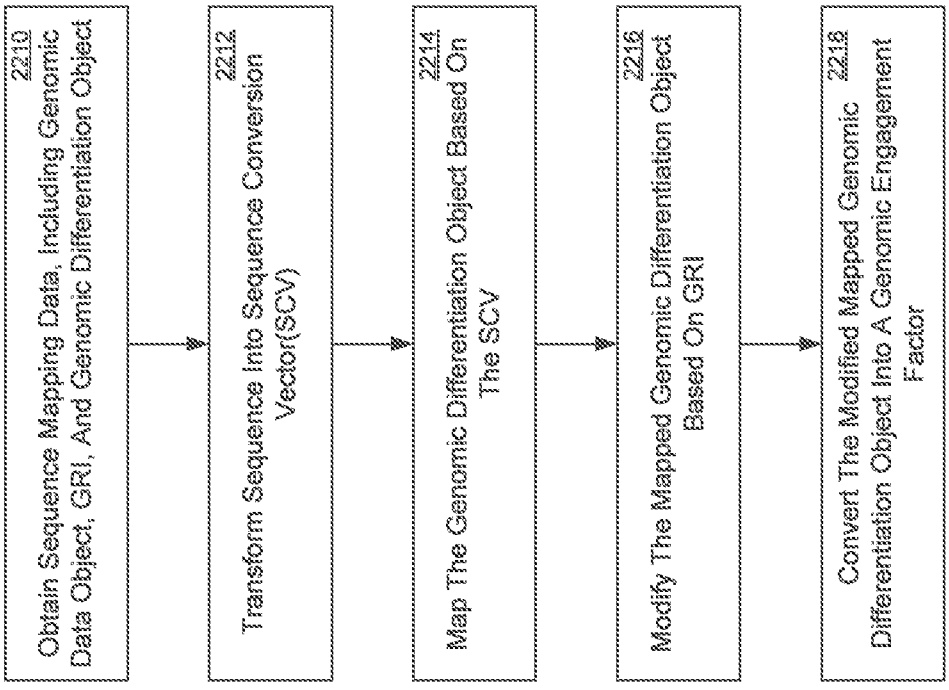

2210
Obtain Sequence Mapping Data, Including Genomic Data Object, GRI, And Genomic Differentiation Object
2212
Transform Sequence Into Sequence Conversion Vector(SCV)
2214
Map The Genomic Differentiation Object Based On The SCV
2216
Modify The Mapped Genomic Differentiation Object Based On GRI
2218
Convert The Modified Mapped Genomic Differentiation Object Into A Genomic Engagement Factor

FIG. 22

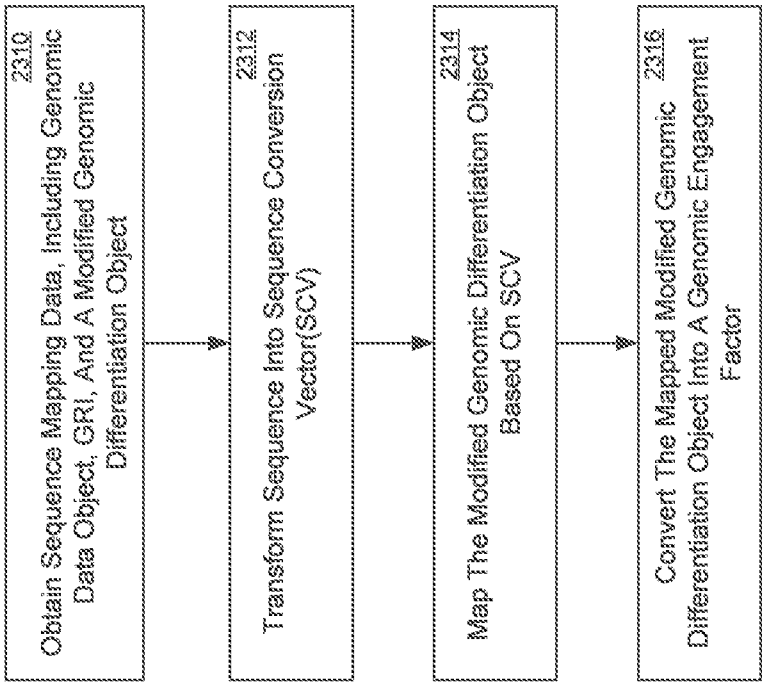

2310
Obtain Sequence Mapping Data, Including Genomic Data Object, GRI, And A Modified Genomic Differentiation Object
2312
Transform Sequence Into Sequence Conversion Vector(SCV)
2314
Map The Modified Genomic Differentiation Object Based On SCV
2316
Convert The Mapped Modified Genomic Differentiation Object Into A Genomic Engagement Factor

FIG. 23

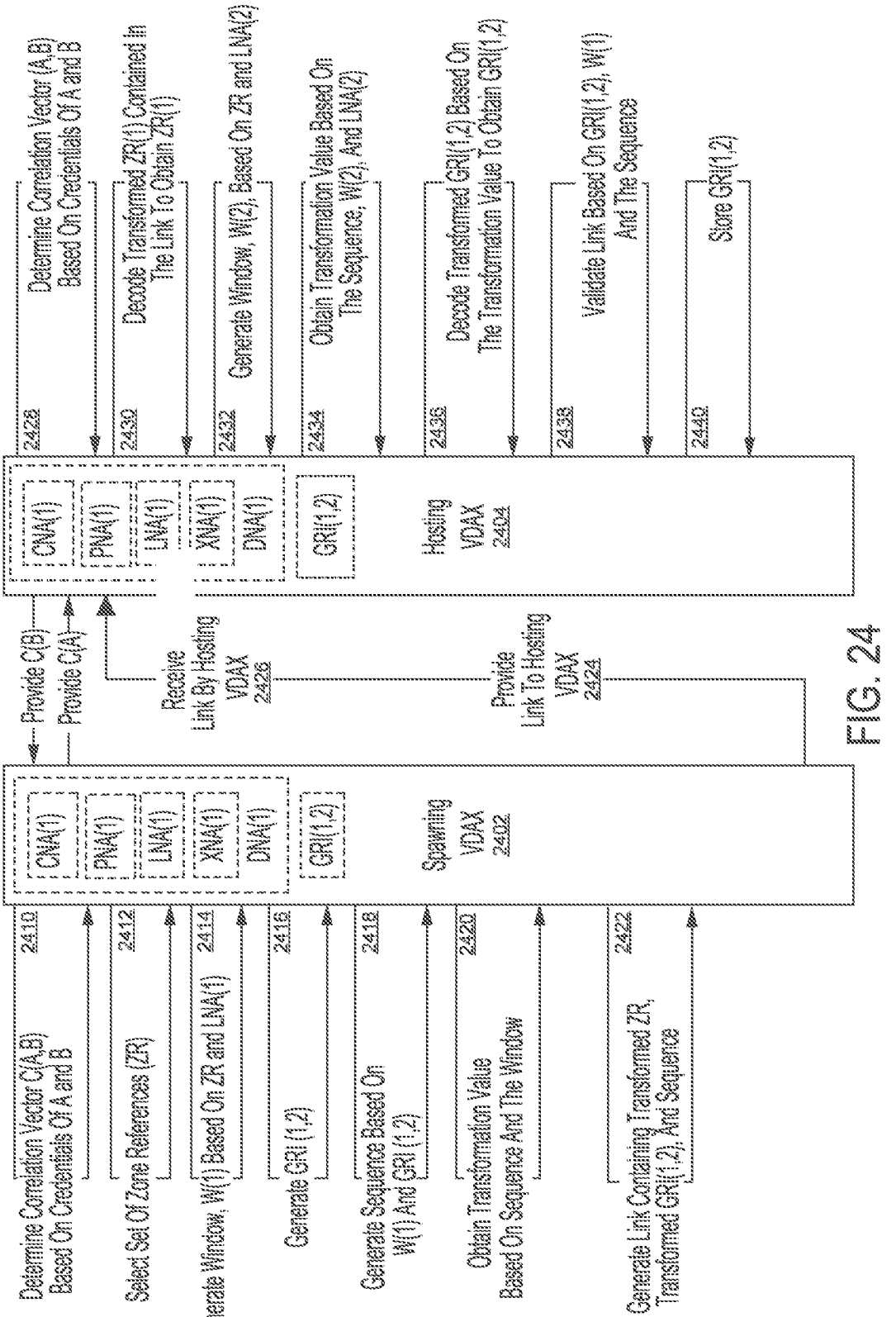

Spawning VDAX 2402
Hosting VDAX 2404
Provide C(B)
Provide C(A)
Receive Link By Hosting VDAX 2426
Provide Link To Hosting VDAX 2424
CNA(1)
PNA(1)
LNA(1)
XNA(1)
DNA(1)
GRI(1,2)
2410 Determine Correlation Vector C(A,B) Based On Credentials Of A and B
2412 Select Set Of Zone References (ZR)
2414 Generate Window, W(1) Based On ZR and LNA(1)
2416 Generate GRI (1,2)
2418 Generate Sequence Based On W(1) And GRI (1,2)
2420 Obtain Transformation Value Based On Sequence And The Window
2422 Generate Link Containing Transformed ZR, Transformed GRI(1,2), And Sequence
2428 Determine Correlation Vector (A,B) Based On Credentials Of A and B
2430 Decode Transformed ZR(1) Contained In The Link To Obtain ZR(1)
2432 Generate Window, W(2), Based On ZR and LNA(2)
2434 Obtain Transformation Value Based On The Sequence, W(2), And LNA(2)
2436 Decode Transformed GRI(1,2) Based On The Transformation Value To Obtain GRI(1,2)
2438 Validate Link Based On GRI(1,2), W(1) And The Sequence
2440 Store GRI(1,2)

FIG. 24

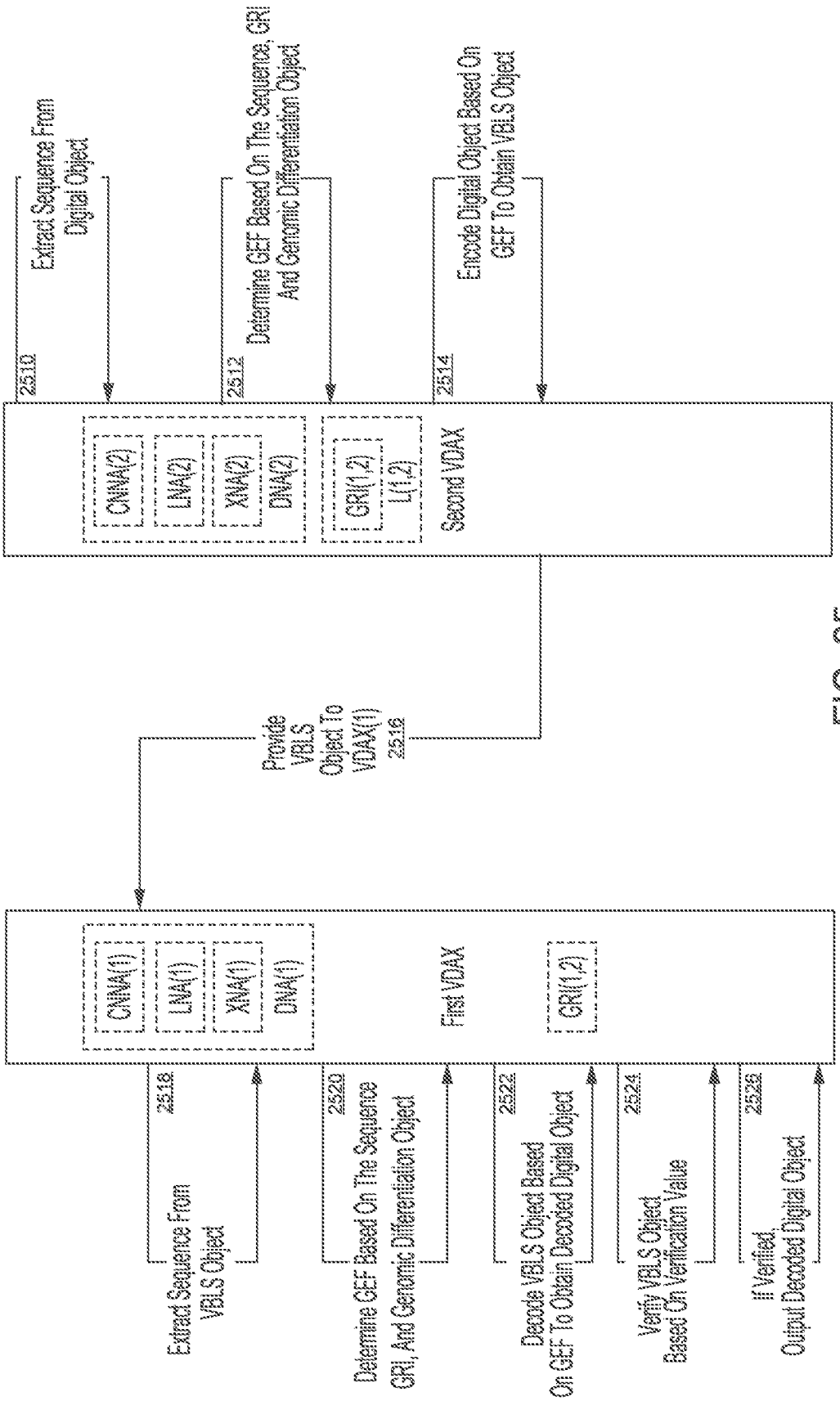

2510
Extract Sequence From Digital Object
2512
Determine GEF Based On The Sequence, GRI And Genomic Differentiation Object
2514
Encode Digital Object Based On GEF To Obtain VBLS Object
CNNA(2)
LNA(2)
XNA(2)
DNA(2)
GRI(1,2)
L(1,2)
Second VDAX
Provide VBLS Object To VDAX(1)
2516
CNNA(1)
LNA(1)
XNA(1)
DNA(1)
First VDAX
GRI(1,2)
2518
Extract Sequence From VBLS Object
2520
Determine GEF Based On The Sequence GRI, And Genomic Differentiation Object
2522
Decode VBLS Object Based On GEF To Obtain Decoded Digital Object
2524
Verify VBLS Object Based On Verification Value
2526
If Verified, Output Decoded Digital Object

FIG. 25

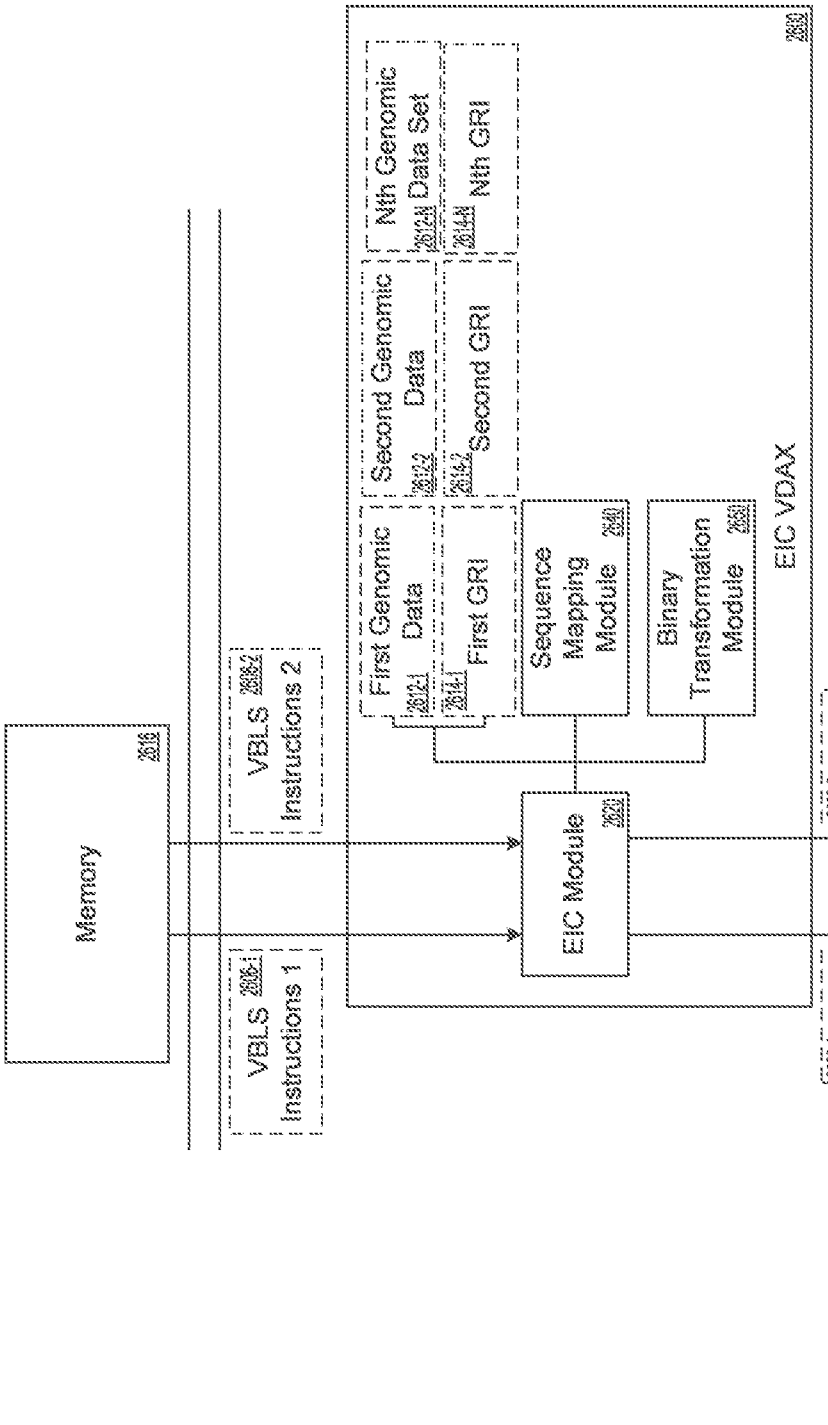

Memory
2016
VBLS Instructions 1
2006-1
VBLS Instructions 2
2006-2
EIC Module
2020
First Genomic Data
2012-1
First GRI
2014-1
Second Genomic Data
2012-2
Second GRI
2014-2
Nth Genomic Data Set
2012-N
Nth GRI
2014-N
Sequence Mapping Module
2040
Binary Transformation Module
2050
EIC VDAX
2030
Binary1
2008-1
Binary2
2008-2
Processing Core(s)
2002
Output/ Data
Input Data

FIG. 26

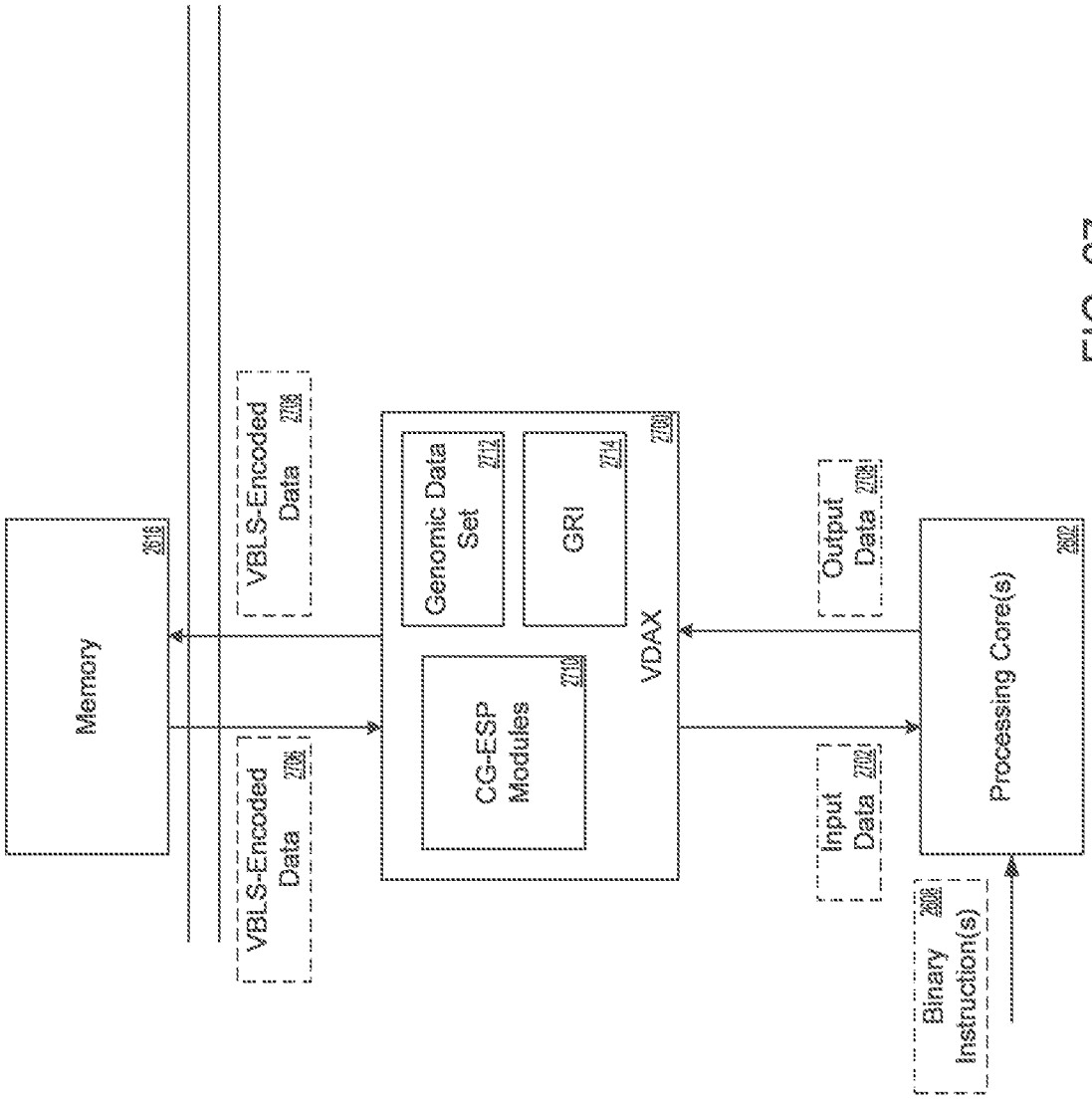

Memory
2616
VBLS-Encoded Data
2706
VBLS-Encoded Data
2706
Genomic Data Set
2712
GRI
2714
CG-ESP Modules
2710
VDAX
2708
Output Data
2708
Input Data
2702
Processing Core(s)
2602
Binary Instruction(s)
2606

FIG. 27

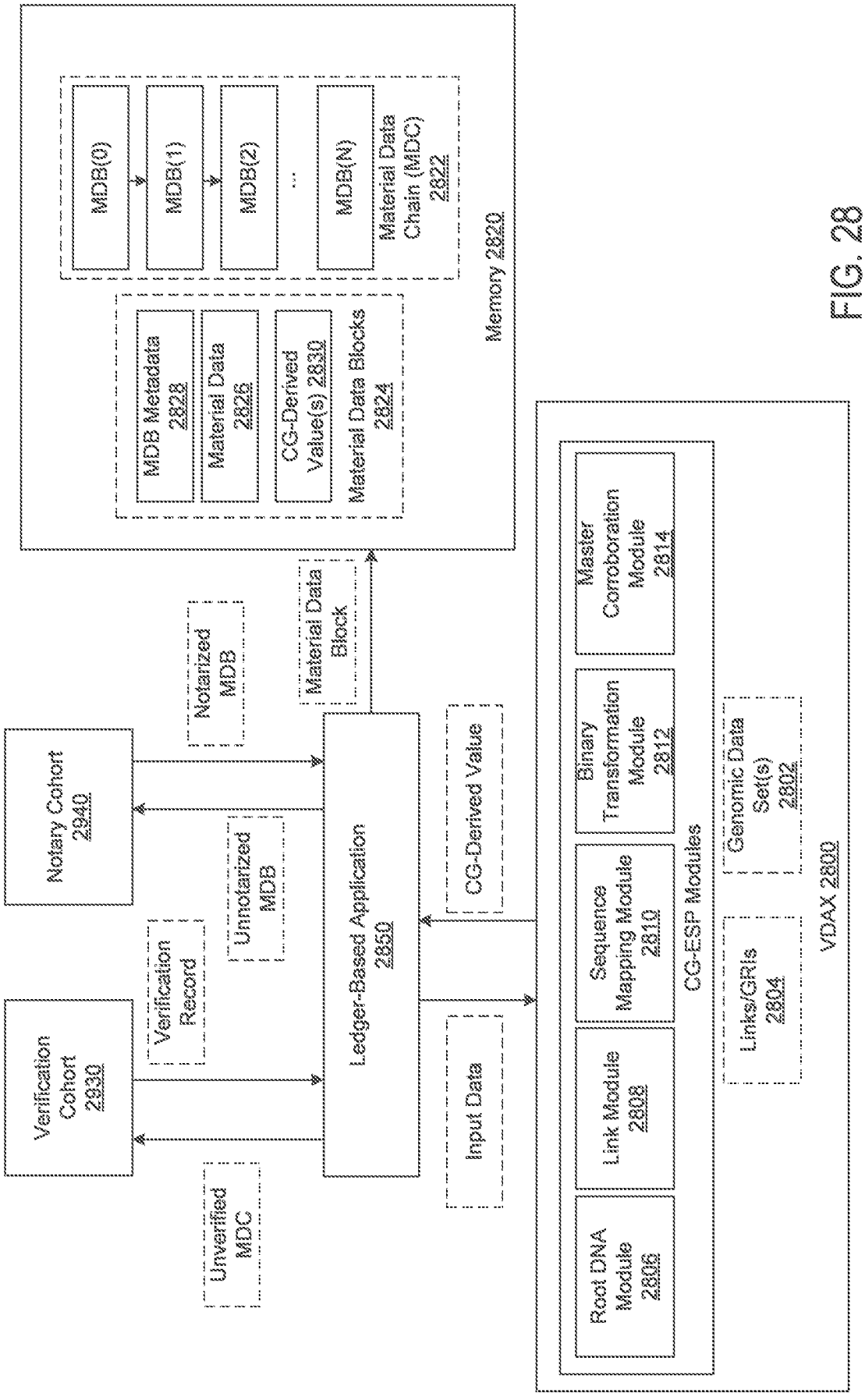

Memory 2820
Material Data Chain (MDC) 2822
MDB(0)
MDB(1)
MDB(2)
...
MDB(N)
Material Data Blocks 2824
MDB Metadata 2828
Material Data 2826
CG-Derived Value(s) 2830
Material Data Block
Notarized MDB
Unnotarized MDB
Verification Record
Notary Cohort 2940
Verification Cohort 2930
Unverified MDC
Ledger-Based Application 2950
Input Data
CG-Derived Value
VDAX 2800
CG-ESP Modules
Root DNA Module 2806
Link Module 2808
Sequence Mapping Module 2810
Binary Transformation Module 2812
Master Corroboration Module 2814
Links/GRIs 2804
Genomic Data Set(s) 2802

FIG. 28

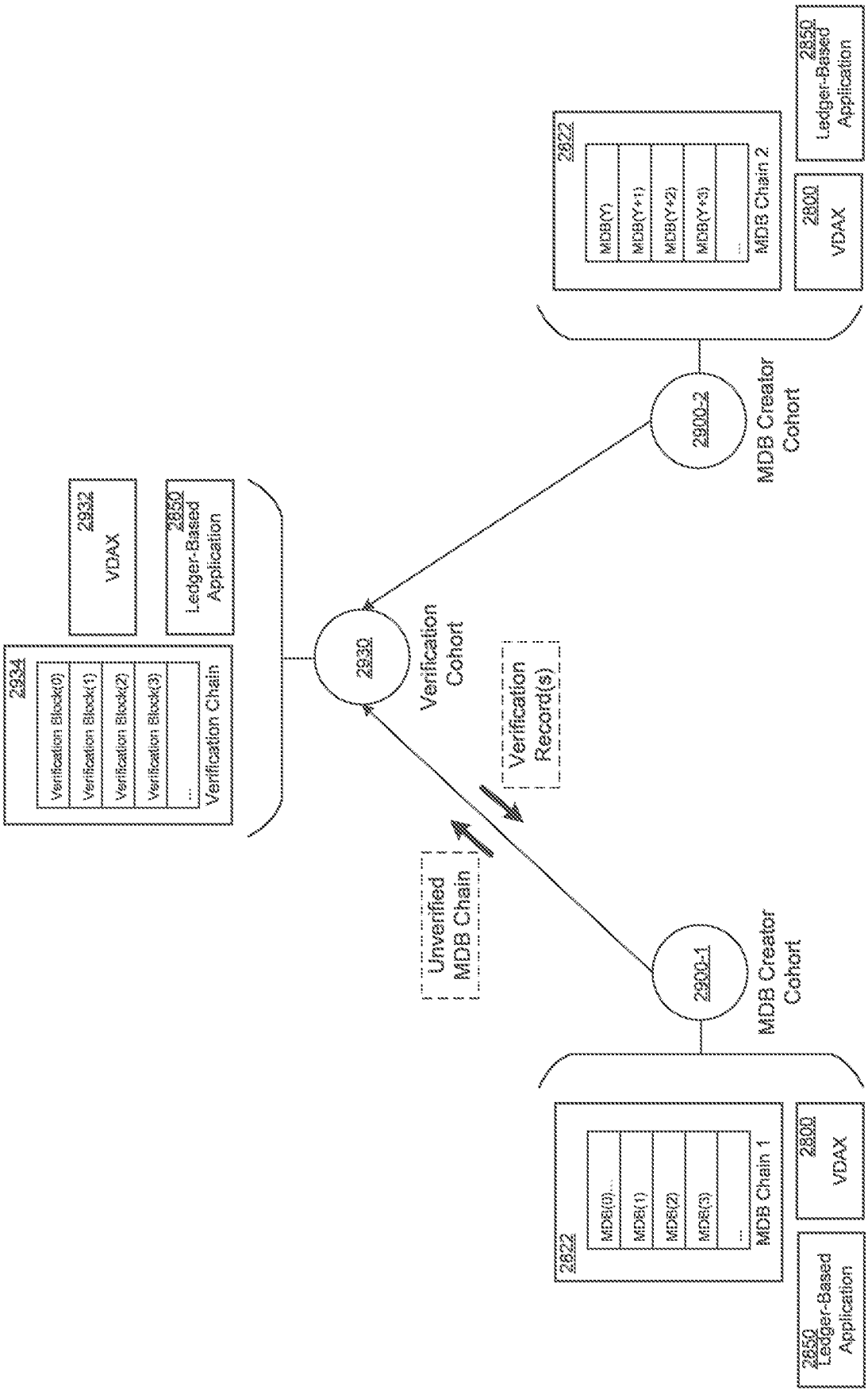

2650
Ledger-Based Application
2800
VDAX
2622
MDB Chain 1
MDB(0)...
MDB(1)
MDB(2)
MDB(3)
...
2900-1
MDB Creator Cohort
Unverified MDB Chain
Verification Record(s)
2930
Verification Cohort
2934
Verification Chain
Verification Block(0)
Verification Block(1)
Verification Block(2)
Verification Block(3)
...
2932
VDAX
2650
Ledger-Based Application
2900-2
MDB Creator Cohort
2622
MDB Chain 2
MDB(Y)
MDB(Y+1)
MDB(Y+2)
MDB(Y+3)
...
2800
VDAX
2650
Ledger-Based Application

FIG. 29

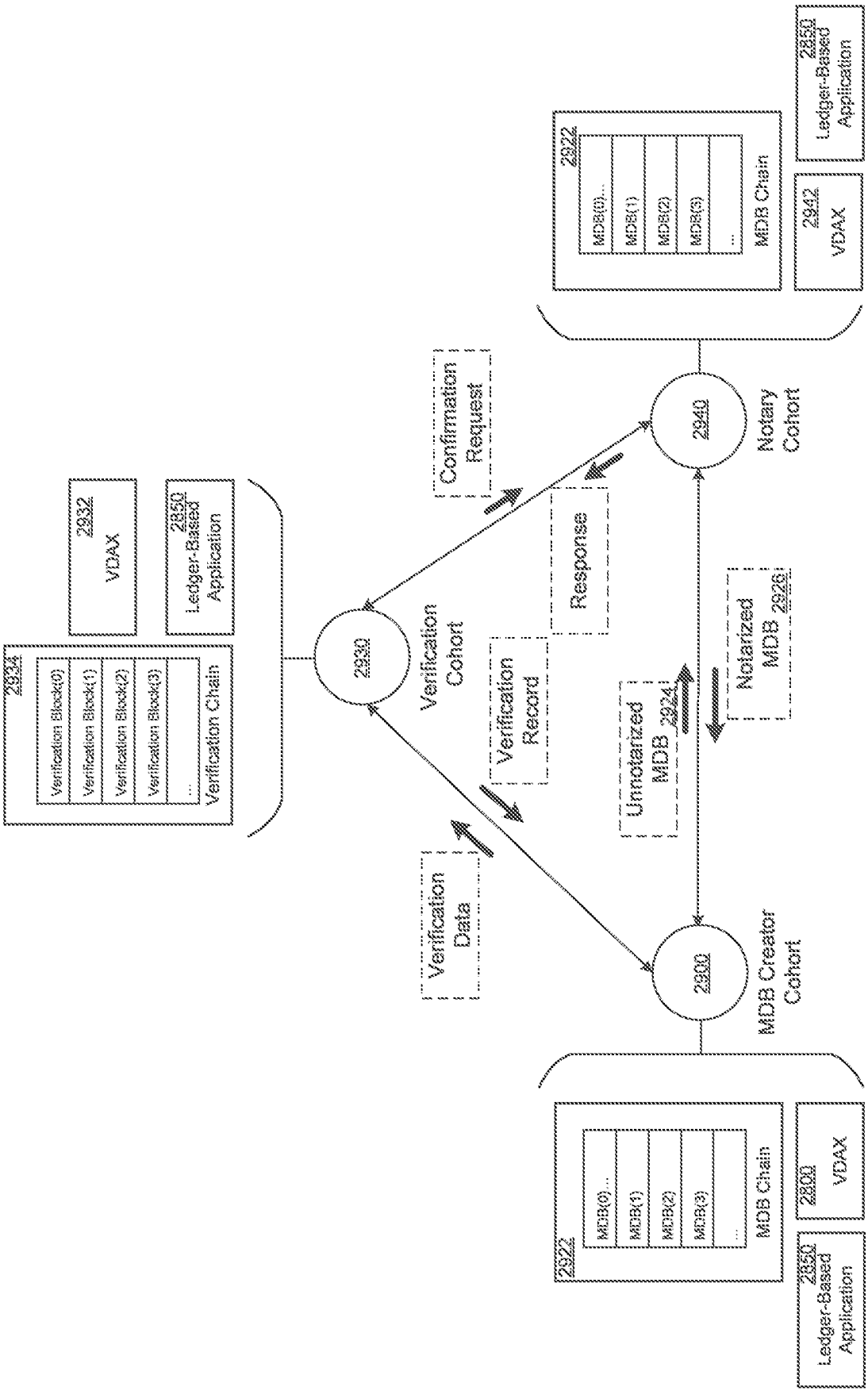

2934
Verification Block(0)
Verification Block(1)
Verification Block(2)
Verification Block(3)
...
Verification Chain
2932
VDAX
2850
Ledger-Based Application
2930
Verification Cohort
Verification Data
Verification Record
Confirmation Request
Response
Unnotarized MDB 2924
Notarized MDB 2926
2940
Notary Cohort
2922
MDB(0)...
MDB(1)
MDB(2)
MDB(3)
...
MDB Chain
2942
VDAX
2850
Ledger-Based Application
2900
MDB Creator Cohort
2922
MDB(0)...
MDB(1)
MDB(2)
MDB(3)
...
MDB Chain
2900
VDAX
2850
Ledger-Based Application

FIG. 30