

Title:	CRYPTOGRAPHIC APPLICATIONS FOR A BLOCKCHAIN SYSTEM		
Priority:	US20160346431P 20160606	US20160296953 20161018	WO2017US35341 20170601

Family:	Publication number	Publication date	Application number	Application date
	AU2017277857 AA	20181115	AU20170277857	20170601
	BR112018074323 A2	20190306	BR20181174323	20170601
	CA3023492 AA	20181106	CA20173023492	20170601
	CL2018003470 A1	20190315	CL20180003470	20181204
	CN109313685 A	20190205	CN201780035064	20170601
	CO20180013180 A2	20181214	CO20180013180	20181205
	EP3465516 A1	20190410	EP20170729994	20170601
	ID201813016 A	20181221	ID2018P0009954	20170601
	IL263261 A0	20181231	IL20170263261	20170601
	IN201817045851 A	20190201	IN201817045851	20181204
	JP2019524018 T2	20190829	JP20180563812T	20170601
	KR20190015287 A	20190213	KR20187035434	20170601
	MX2018015044 A1	20190306	MX20180015044	20170601
	SG11201809866P A1	20181228	SG20181109866	20170601
	US2017353309 AA	20171207	US20160296953	20161018
	US10447478 BB	20191015	US20160296953	20161018
	WO17213943 A1	20171214	WO2017US35341	20170601

Probable Assignee: MICROSOFT CORP

Assignee(s):(std): MICROSOFT CORP ; MICROSOFT TECH LICENSING LLC ; MICROSOFT TECHNOLOGY LICENSING LLC

Assignee(s): GRAY JOHN MARLEY

Inventor(s):(std): GRAY JOHN MARLEY ; JOHN MARLEY GRAY

Agent(s): DAVIES COLLISON CAVE PTY LTD; SMART AND BIGGAR; ESTUDIO VILLASECA Y CIA; GRUENECKER PATENT U RECHTSANWALTE PARTG MBB; LANNY SETTAWAN MBA MGMT MA LPC MA LMFT; ONO SHINJIRO; YAMAMOTO OSAMU; MIYAMAE TORU; NAKANISHI MOTOHARU; MANNAVA AND KANG PC; MINHAS SANDIP ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DJ DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KH KM KN KP KR KW KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QZ RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZW ZY

International class G06F21/51 G06F21/53 G06F21/62 G06Q20/06 G06Q20/38 H04L H04L29/06
(IPC 8-9): H04L9/32 (Advanced/Invention);
H04L (Subclass/Invention)

International class H04L9/32

CPC: G06F21/51 G06F21/53 G06Q2220/00 H04L9/3239 H04L2209/38 H04L2209/56 H04L2209/76
G06Q20/3829 H04L9/3236 H04L9/32

US class: 1/1 713/168

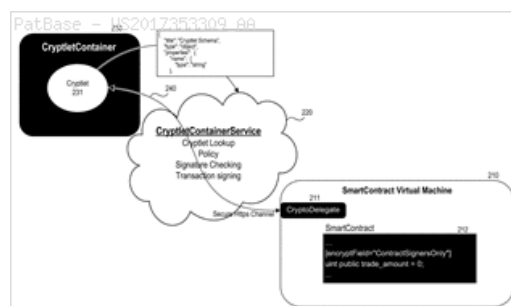
Classification Explorer

Cited documents: US2017011460 AA, US2016335533 AA, US2016283920 AA, US2016261690 AA, US2016055553 AA, US2015379510 AA, US2015358312 AA, US2015356555 AA, US2015332283 AA, AU2016100059 AD,

Forward Citations: WO19177828, WO19161016, WO19152119, WO19126471, WO18205730, US2019034889, US2019034402, US10460283, US10452776, US10373130, US10185595, US10171509, US10108938, US10055715, EP3540662, EP3528112, EP3499847.

Abstract:

A method is provided for delegating behavior of a smart contract associated with a blockchain to code that is not part of the blockchain. A system directs execution by a virtual machine of the smart contract. During execution of the smart contract, the smart contract sends to a cryptlet container service, via a cryptodelegate, a request to delegate a behavior to a cryptlet that executes on an attested host. During execution the cryptlet container service identifies a host for executing code of the cryptlet in an appropriate cryptlet container. The cryptlet container service directs the identified host to execute the code of the cryptlet to perform the delegated behavior. After the delegated behavior is performed, the cryptlet container service receives from the cryptlet a response to the requested behavior. The cryptlet container service sends the response to the smart contract on the blockchain that is verified by the cryptodelegate.



2) Family number: 71885196 (US2018330077A)

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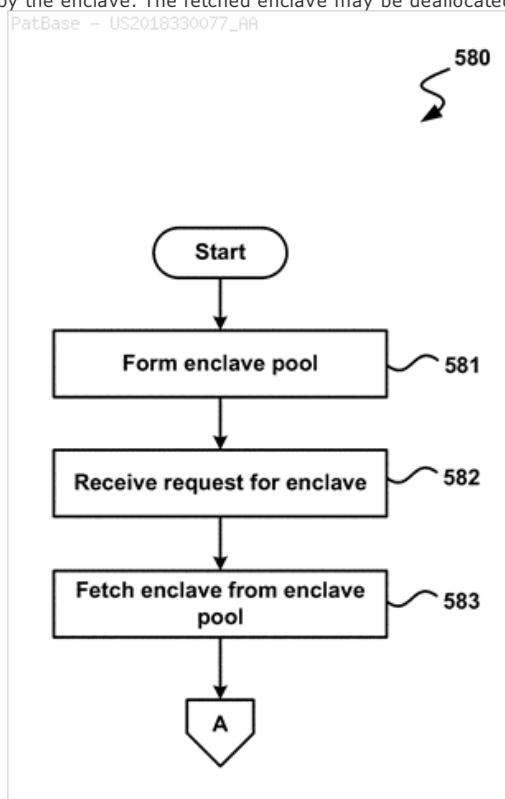
Title: ENCLAVE POOLS
Priority: US20170592750 20170511
Family:

Publication number	Publication date	Application number	Application date
US2018330077 AA	20181115	US20170592750	20170511

Probable Assignee: MICROSOFT CORP
Assignee(s):(std): MICROSOFT TECHNOLOGY LICENSING LLC
Assignee(s): MICROSOFT CORP
Inventor(s):(std): GRAY JOHN MARLEY
International class (IPC 8-9): G06F21/53 H04L9/32 (Advanced/Invention)
CPC: G06F21/53 G06F21/64 H04L2209/38 H04L9/3236 H04L9/3255 H04L9/3297 H04L2209/56
US class: 1/1 713/190

[Classification Explorer](#)**Abstract:**

The disclosed technology is generally directed to secure transactions. In one example of the technology, an enclave pool is formed. The enclave pool may include a plurality of enclaves that are secure execution environments. In some examples, forming the enclave pool includes registering the enclaves of the enclave pool. A request to allocate an enclave from the enclave pool may be received. An enclave may be fetched from the enclave pool responsive to the request to assign the enclave. Cryptlet code is executed in the fetched enclave such that a payload is generated in the enclave. The payload can be digitally signed and/or encrypted by the cryptlet, and can also be digitally signed by the enclave. The fetched enclave may be deallocated.

**3) Family number: 74022202** (US2019116174A)

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Title: SELECTING AND SECURING PROOF DELGATES FOR CRYPTOGRAPHIC FUNCTIONS
Priority: US20170785371 20171016
Family:

Publication number	Publication date	Application number	Application date
US2019116174 AA	20190418	US20170785371	20171016
WO19078945 A1	20190425	WO2018US46392	20180811

Probable Assignee: MICROSOFT CORP
Assignee(s):(std): MICROSOFT TECHNOLOGY LICENSING LLC
Assignee(s): MICROSOFT CORP
Inventor(s):(std): GRAY JOHN MARLEY
Agent(s): MINHAS SANDIP S ET AL
Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DJ DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JO JP KE KG KH KM KN KP KR KW KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW
International class (IPC 8-9): G06F9/455 H04L29/06 H04L9/32 (Advanced/Invention)

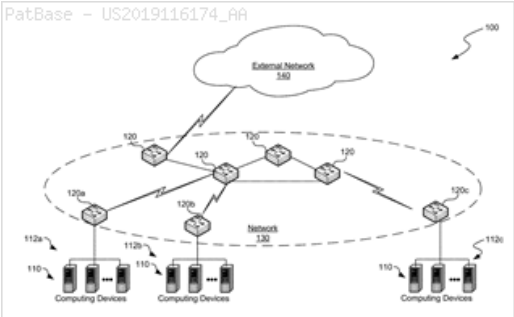
CPC: H04L63/0823 H04L63/029 G06F9/45558 H04L9/3271 G06Q20/0658 H04L63/0435 H04L9/3218
G06F2009/4557 H04L63/0442 H04L9/3234 H04L9/3239 H04L9/3247 H04L2209/127 H04L2209/38

US class: 1/1

[Classification Explorer](#)

Cited documents: US9679276 BA, US2016342959 AA,

Abstract:
The disclosed technology is generally directed to cryptographic functions for smart contracts. In one example of the technology, a request for cryptographic resources is received. The request for cryptographic resources includes a binding identity (ID). Cryptographic resources are fetched from at least one cryptographic resource pool of a plurality of cryptographic resource pools responsive to the request for cryptographic resources. Separate cryptographic resource pools of the plurality of cryptographic resource pools are pools of separate types of cryptographic resources. Which type of proof delegate code is suitable for each fetched cryptographic resource is determined. For each fetched cryptographic resource, the determined type of proof delegate code is injected into the fetched cryptographic resource.



4) Family number: 74513275 (US2019164136A)

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Title: BEACON NETWORK WITH ENTERPRISE SMART CONTRACTS HAVING A CENTRALIZED LEDGER

Priority: US20170824005 20171128

Family:	Publication number	Publication date	Application number	Application date
	US2019164136 AA	20190530	US20170824005	20171128
	WO19108448 A1	20190606	WO2018US62149	20181121

Probable Assignee: MICROSOFT CORP

Assignee(s):(std): MICROSOFT TECHNOLOGY LICENSING LLC

Assignee(s): MICROSOFT CORP

Inventor(s):(std): GRAY JOHN MARLEY

Agent(s): MINHAS SANDIP S ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DJ DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JO JP KE KG KH KM KN KP KR KW KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

International class (IPC 8-9): G06F17/30 G06Q20/02 G06Q20/06 G06Q20/40 G06Q30/06 (Advanced/Invention)

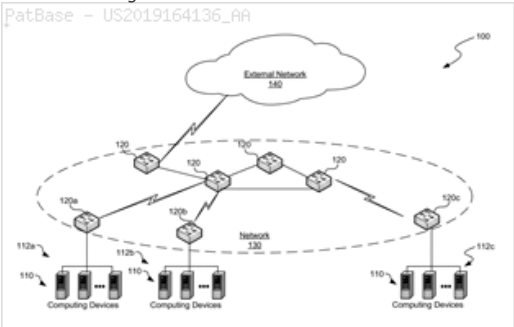
CPC: G06Q20/06 G06Q2220/00 G06F17/30283 G06Q30/0611 G06F16/27 G06Q20/02 G06Q20/405

US class: 1/1

[Classification Explorer](#)

Cited documents: WO17178956 A1, US2016284033 AA,

Abstract:
The disclosed technology is generally directed to smart contracts. In one example of the technology, a first sub-contract is initialized based on communications from a first beacon node and a second beacon node. Initializing the first sub-contract includes seeding an asset on a ledger based on the first sub-contract. One or more additional sub-contracts are initialized based on communications from the beacon nodes such that the first sub-contract and the one or more additional sub-contracts together form an enterprise smart contract, and such that each sub-contract of the enterprise smart contract interrelates to at least one other sub-contract of the enterprise smart contract. Execution of logic for the enterprise smart contract is controlled. Information associated with the execution of the logic for the enterprise contract is stored on the ledger.



5) Family number: 73618276 (US2019089537A)

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Title: CRYPTLET BINDING KEY GRAPH

Priority: US20170709288 20170919

Family:

Publication number	Publication date	Application number	Application date
US2019089537 AA	20190321	US20170709288	20170919
WO19060017 A1	20190328	WO2018US39641	20180627

Probable Assignee: MICROSOFT CORP

Assignee(s):(std): MICROSOFT TECHNOLOGY LICENSING LLC

Assignee(s): MICROSOFT CORP

Inventor(s):(std): GRAY JOHN MARLEY

Agent(s): MINHAS SANDIP S ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DJ DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JO JP KE KG KH KM KN KP KR KW KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

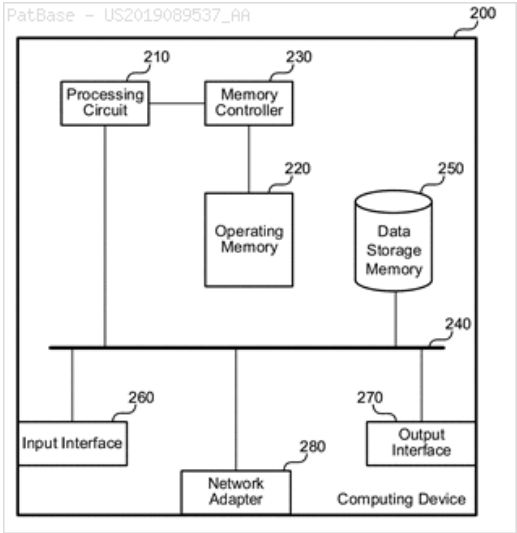
International class (IPC 8-9): G06F21/53 G06Q20/38 H04L29/06 H04L9/06 H04L9/08 H04L9/14 H04L9/30 H04L9/32 (Advanced/Invention)

CPC: H04L9/3226 H04L9/0637 H04L2209/12 H04L9/14 H04L9/30 H04L9/0894 G06F21/53 H04L63/06 G06Q20/3226 G06Q20/3825 G06Q20/3829 G06Q20/385 G06Q2220/00

US class: 1/1

[Classification Explorer](#)

Abstract:
The disclosed technology is generally directed to secure transactions. In one example of the technology, a first enclave to be used for executing a cryptlet binary of a first cryptlet is identified. The first enclave may be a secure execution environment that stores an enclave private key, and the first cryptlet may be associated with at least a first counterparty. A cryptlet binding that is associated with the first cryptlet may be generated, and may include counterparty information that is associated with at least the first counterparty. Cryptlet binding information may be provided to a cryptlet binding key graph, and a location of a first hardware security module (HSM) that stores a key that is associated with the first counterparty may be received from the cryptlet binding key graph.



6) Family number: 76267358 (US2019325044A)

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Title: RELATIONAL DISTRIBUTED LEDGER FOR SMART CONTRACTS

Priority: US20180961650 20180424

Family:

Publication number	Publication date	Application number	Application date
US2019325044 AA	20191024	US20180961650	20180424
WO19209573 A1	20191031	WO2019US27574	20190416

Probable Assignee: MICROSOFT CORP

Assignee(s):(std): MICROSOFT TECHNOLOGY LICENSING LLC

Assignee(s): MICROSOFT CORP

Inventor(s):(std): GRAY JOHN MARLEY

Agent(s): MINHAS SANDIP S ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DJ DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JO JP KE KG KH KM KN KP KR KW KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

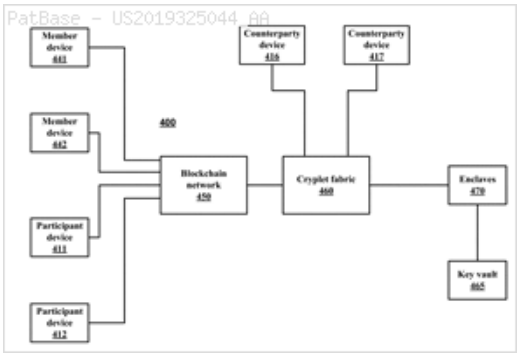
International class (IPC 8-9): G06F17/30 G06Q20/38 G06Q20/40 G06Q50/18 H04L9/06 (Advanced/Invention)

CPC: G06F17/30283 G06F17/30595 G06F21/645 G06Q50/18 H04L9/0637 G06F21/64 G06Q20/3829 G06Q20/389 G06Q20/4016 H04L9/3239 H04L2209/38 G06F16/27 G06F16/284

[Classification Explorer](#)

Abstract:
Data structures stored on a distributed ledger are accessed. The data structures identify registered smart contract components that include counterparties, schemas, and contract cryptlet. A first template smart contract data structure for a first smart contract is composed on the distributed ledger such that the first template smart contract data structure is a relational data structure that includes an identifier for the first smart contract, an identifier for at least two counterparties, an identifier for at

least one schema, and an identifier for at least one contract cryptlet. A first smart contract ledger instance associated with the first ledger instance is caused to be deployed, such that the first smart contract ledger instance is based on the first template smart contract data structure. The first smart contract is caused to begin execution, such that the first smart contract is based on the first template smart contract data structure.



7) Family number: 75907688 (US2019288853A) © PatBase

Title:

BINDING VERSION STAMP FOR SMART CONTRACTS

Priority:

US20180922756 20180315

Family:

Publication number	Publication date	Application number	Application date
US2019288853 AA	20190919	US20180922756	20180315
WO19177828 A1	20190919	WO2019US20865	20190306

Probable Assignee:

MICROSOFT CORP

Assignee(s):(std):

MICROSOFT TECHNOLOGY LICENSING LLC

Assignee(s):

MICROSOFT CORP

Inventor(s):(std):

GRAY JOHN MARLEY

Agent(s):

MINHAS SANDIP S ET AL

Designated states:

AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DJ DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JO JP KE KG KH KM KN KP KR KW KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

International class (IPC 8-9):

G06F21/00 G06Q20/38 H04L9/06 H04L9/08 H04L9/32 (Advanced/Invention)

CPC:

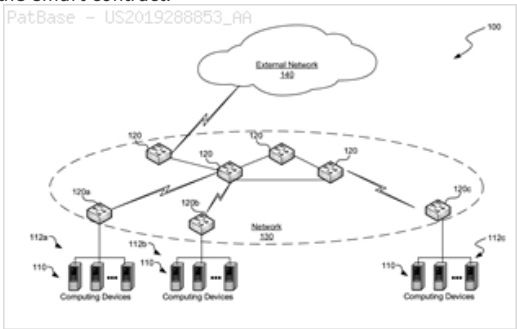
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Classification Explorer

Cited documents:

WO17145019 A1, US2017353309 AA, US2007180075 AA, JP2006293448 A2,

Abstract:
In one example, a smart contract is generated such that the smart contract includes a schema and at least two counterparties. An updated version of the smart contract is generated. The updated version of the smart contract is stamped with a version stamp. The version stamp is used to prove the validity of the updated version of the smart contract.



8) Family number: 72767817 (US2019012249A) © PatBase

Title:

BLOCKCHAIN ANALYTICS

Priority:

US20170530081P 20170707 US20180995062 20180531 US20180957458 20180419 US20180995070 20180531 US20180987448 20180523 US20180995078 20180531

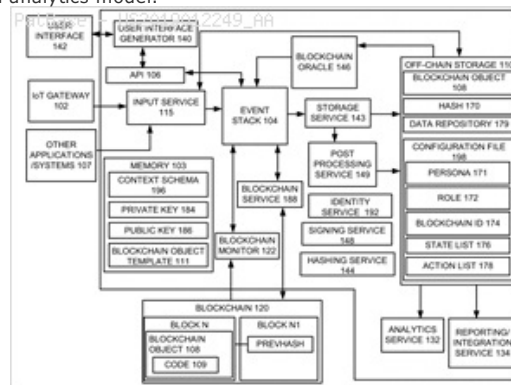
Family:

Publication number	Publication date	Application number	Application date
US2019012249 AA	20190110	US20180995062	20180531
US2019013932 AA	20190110	US20180957458	20180419
US2019013933 AA	20190110	US20180987448	20180523
US2019013934 AA	20190110	US20180995070	20180531
US2019013948 AA	20190110	US20180995078	20180531
WO19010063 A1	20190110	WO2018US40077	20180628
WO19010064 A1	20190110	WO2018US40087	20180628
WO19010065 A1	20190110	WO2018US40096	20180628

WO19010067 A1	20190110	WO2018US40103	20180628
WO19010068 A1	20190110	WO2018US40108	20180628

Probable Assignee: MICROSOFT CORP
Assignee(s):(std): MICROSOFT TECHNOLOGY LICENSING LLC
Assignee(s): MICROSOFT CORP
Inventor(s):(std): MAINO ERIC I ; MERCURI MARC E ; RAJABI ZEYAD
Agent(s): MANNAVA ASHOK K
Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DJ DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JO JP KE KG KH KM KN KP KR KW KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW
International class (IPC 8-9): G06F11/30 G06F11/34 G06F15/18 G06F17/30 G06F21/60 G06F21/64 G06F9/451 G06F9/54 G06Q20/06 G06Q20/40 H04L29/06 H04L9/06 H04L9/32 (Advanced/Invention)
CPC: G06F21/602 G06F21/645 G06N3/08 G06Q20/02 G06Q20/06 G06Q20/3827 G06Q20/405 G06Q2220/00 H04L9/3236 H04L9/3239 H04L9/3247 H04L63/102 H04L63/123 H04L2209/38 H04L2209/56 H04W4/70 G06F9/451 G06F9/542 G06F9/546 G06F11/3072 G06F11/3476 G06F16/212 G06F16/27 G06F16/904 G06N20/00 H04L9/0637 H04L9/0643 H04L9/3242 H04L9/3265 H04L63/101
US class: 1/1 706/12 713/168 713/170 713/176
[Classification Explorer](#)
Cited documents: WO17098519 A1,
Forward Citations: US10462223, US10459990, US10425230, US10380613, US10326802, US10320574,

Abstract:
A blockchain analytics system facilitates determination of parameters of blockchain objects for analytics. Examples of parameters of the blockchain object may include an identity of a participant, a role of a participant, a type of the blockchain object and the like. The system may store parameters of blockchain objects in the data repository. The system may use the determined parameters to generate a machine learning blockchain analytics model. The system may generate visualizations, detect patterns and/or for detecting anomalies based on the machine learning blockchain analytics model.



9) Family number: 71883840 (US2018330125A)

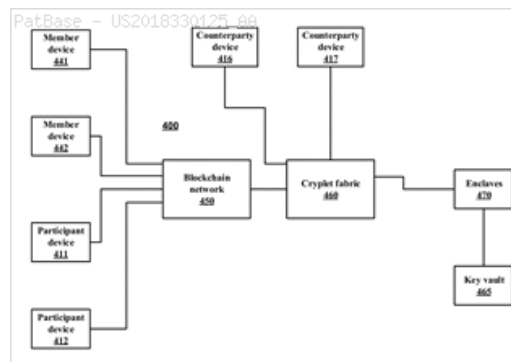
© PatBase

Title: ENCLAVE RING AND PAIR TOPOLOGIES
Priority: US20170505038P 20170511 US20170632247 20170623
Family:

Publication number	Publication date	Application number	Application date
US2018330125 AA	20181115	US20170632247	20170623
WO18208413 A1	20181115	WO2018US27001	20180411

Probable Assignee: MICROSOFT CORP
Assignee(s):(std): MICROSOFT TECHNOLOGY LICENSING LLC
Assignee(s): MICROSOFT CORP
Inventor(s):(std): GRAY JOHN MARLEY
Agent(s): MINHAS SANDIP S ET AL
Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DJ DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JO JP KE KG KH KM KN KP KR KW KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW
International class (IPC 8-9): G06F21/51 G06F21/53 G06F21/60 G06F21/72 G06F21/74 G06Q20/06 H04L29/06 H04L9/08 H04L9/14 H04L9/32 (Advanced/Invention)
CPC: G06F21/72 H04L9/3255 H04L9/14 H04L9/0894 G06F21/51 G06F21/53 G06F21/602 G06F21/74 G06Q20/065 H04L9/32 H04L9/3221 H04L63/12 H04L2209/38 H04L9/085 H04L9/3236 H04L2209/56
US class: 1/1 713/189
[Classification Explorer](#)
Cited documents: US2016350534 AA, US2015356524 AA,

Abstract:
In one example, a first enclave for use by a first counterparty to a smart contract is identified. A second enclave for use by a second counterparty to the smart contract may be identified. Secrets associated with the first counterparty to the first enclave may be caused to be securely provided. Secrets associated with the second counterparty to the second enclave may be caused to be securely provided. A cryptlet is caused to be provided to the first enclave. The cryptlet may be caused to be provided to the second enclave. A payload is received from the first enclave. A payload may be received from the second enclave. Validation may be caused to be performed for a plurality of payloads. The plurality of payloads may include the payload from the first enclave and the payload from the second enclave.



10) Family number: 71883846 (US2018331821A)

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Title: CRYPTLET IDENTITY

Priority: US20170592928 20170511

Family:	Publication number	Publication date	Application number	Application date
	US2018331821 AA	20181115	US20170592928	20170511
	WO18208422 A1	20181115	WO2018US27201	20180412

Probable Assignee: MICROSOFT CORP

Assignee(s):(std): MICROSOFT TECHNOLOGY LICENSING LLC

Assignee(s): MICROSOFT CORP

Inventor(s):(std): GRAY JOHN MARLEY

Agent(s): MINHAS SANDIP S ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DJ DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JO JP KE KG KH KM KN KP KR KW KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

International class G06F21/51 G06F21/53 H04L9/06 H04L9/08 H04L9/14 H04L9/30 H04L9/32 (Advanced/Invention)

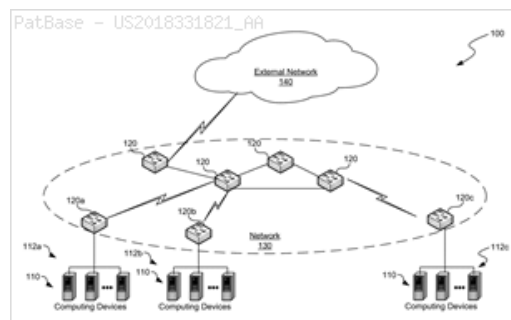
CPC: H04L9/0637 H04L9/0861 H04L9/0894 H04L9/0643 H04L9/30 H04L9/3247 H04L9/14 G06F21/51 G06F21/53 H04L9/0897 H04L9/3236 H04L2209/38

US class: 1/1 380/44

[Classification Explorer](#)

Abstract:

In one example, the cryptlet binary and a cryptlet key pair are provided to an enclave. A cryptlet key pair for the first cryptlet includes a cryptlet private key and a cryptlet public key. A cryptlet binding associated with a first cryptlet includes at least one binding. Each binding includes a mapping between the first cryptlet and at least one of a smart contract or another cryptlet. A binding identification is associated with the cryptlet binding. An output is received from the first cryptlet, such that the output is at least one of encrypted or signed by the cryptlet private key, and such that the output is signed by an enclave private key. A cryptlet identity is generated for the first cryptlet, such that the cryptlet identification includes: the hash of the cryptlet binary, the cryptlet public key, and the binding identification.



11) Family number: 76352846 (US2019334715A)

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Title: CRYPTLET PROOFING SERVICES

Priority: US20180963601 20180426

Family:	Publication number	Publication date	Application number	Application date
	US2019334715 AA	20191031	US20180963601	20180426
	WO19209605 A1	20191031	WO2019US28010	20190418

Probable Assignee: MICROSOFT CORP

Assignee(s): MICROSOFT CORP ; MICROSOFT TECHNOLOGY LICENSING LLC

Inventor(s): GRAY JOHN MARLEY

Agent(s): MINHAS SANDIP S ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DJ DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU

ID IE IL IN IR IS IT JO JP KE KG KH KM KN KP KR KW KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG
MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC
SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

International class
(IPC 8-9):

G06F21/64 G06F21/74 H04L9/30 H04L9/32 (Advanced/Invention)

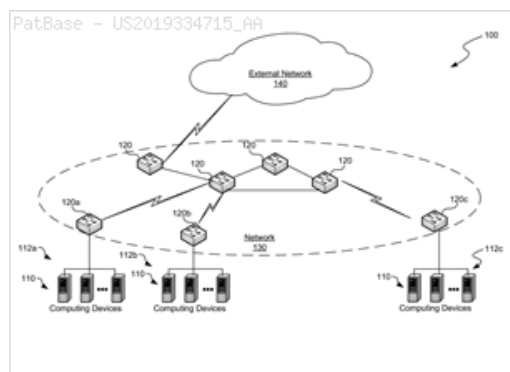
CPC:

H04L9/30 H04L9/3247

[Classification Explorer](#)

Abstract:

Proof onions for transactions for smart contracts are stored. Details of the transactions are stored on blockchains separate from the proof onions. The proof onions are evidence structures for the steps taken to create any transaction for the smart contract. The proof onions include a plurality of signatures or other cryptographic proofs. A proof request that is associated with at least a first transaction of the transactions is received. A first proof onion of the proof onions that corresponds to the first transaction is retrieved. A plurality of public keys associated with the first proof onion is obtained. The plurality of public keys is used to validate the first proof onion. In response to the validation of the first proof onion, the proof request is responded to with at least an indication of the validity of the first transaction.



12) Family number: 71883848 (US2018330343A)

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Title: CRYPTLET SMART CONTRACT

Priority: US20170593001 20170511

Family:

Publication number	Publication date	Application number	Application date
US2018330343 AA	20181115	US20170593001	20170511
WO18208424 A1	20181115	WO2018US27203	20180412

Probable Assignee: MICROSOFT CORP

Assignee(s):(std): MICROSOFT TECHNOLOGY LICENSING LLC

Assignee(s): MICROSOFT CORP

Inventor(s):(std): GRAY JOHN MARLEY

Agent(s): MINHAS SANDIP S ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR
CU CY CZ DE DJ DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU
ID IE IL IN IR IS IT JO JP KE KG KH KM KN KP KR KW KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG
MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC
SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

International class
(IPC 8-9): G06Q20/06 G06Q20/38 H04L9/08 H04L9/32 (Advanced/Invention)

CPC: G06Q20/065 G06Q20/3829 H04L9/0897 H04L9/3236 H04L2209/38

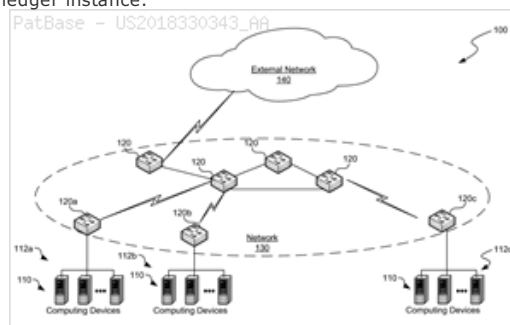
US class: 1/1 705/64

[Classification Explorer](#)

Forward Citations: US10460283,

Abstract:

The disclosed technology is generally directed to secure transactions. In one example of the technology, a smart contract is generated based at least in part on a schema and provided information. The smart contract may be caused to be deployed on a ledger as a smart contract ledger instance. A unique address associated with the deployed smart contract ledger instance may be received. A cryptlet binding for a first contract cryptlet that is associated with the smart contract ledger instance may be generated. The cryptlet binding may be sent to the first contract cryptlet. Responsive to a state change associated with the first contract cryptlet, an update may be communicated to the smart contract ledger instance.

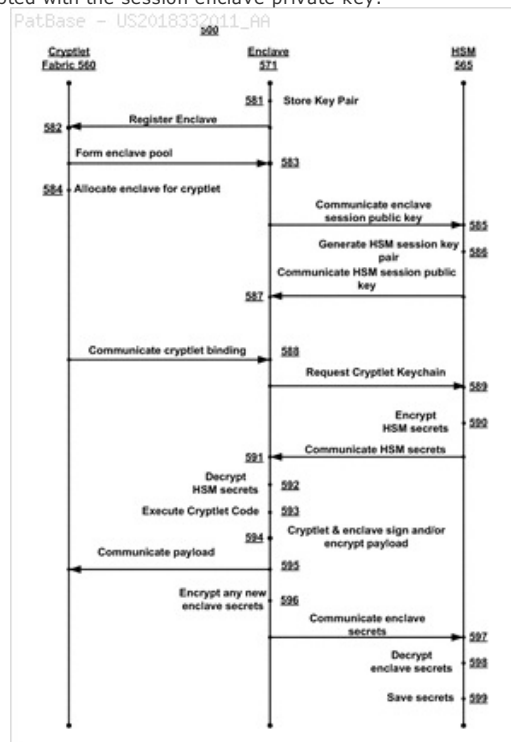


Title: SECURE CRYPTLET TUNNEL**Priority:** US20170592697 20170511

Family:	Publication number	Publication date	Application number	Application date
	US2018332011 AA	20181115	US20170592697	20170511
	WO18208425 A1	20181115	WO2018US27208	20180412

Probable Assignee: MICROSOFT CORP**Assignee(s):(std):** MICROSOFT TECHNOLOGY LICENSING LLC**Assignee(s):** MICROSOFT CORP**Inventor(s):(std):** GRAY JOHN MARLEY**Agent(s):** MINHAS SANDIP S ET AL**Designated states:** AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DJ DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JO JP KE KG KH KM KN KP KR KW KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW**International class (IPC 8-9):** G06F21/53 G06Q20/38 H04L29/06 H04L9/08 H04L9/32 (Advanced/Invention)**CPC:** H04L9/3247 H04L2209/38 G06F21/53 H04L9/0825 G06Q20/382 G06Q20/3825 G06Q20/3829 H04L9/3234 H04L63/06 H04L9/0841 H04L9/3236 H04L9/0897 H04L63/0442 H04L63/12 G06Q2220/00**US class:** 1/1 713/171[Classification Explorer](#)**Cited documents:** WO17007725 A1, US9584517 BA, US2014317686 AA,**Abstract:**

The disclosed technology is generally directed to secure transactions. In one example of the technology, a secure encrypted communication tunnel between the enclave and a hardware security module (HSM) may be established and used. Establishing the tunnel includes the following steps. A session public/private enclave key pair, including a session enclave private key and a session enclave public key, may be derived from the public/private key pair of the enclave. The session enclave public key may be sent to the HSM. A session HSM public key may be received from the HSM. Additional information may be encrypted with the session HSM public key. The encrypted additional information may be sent to the HSM. Further encrypted information may be received from the HSM. The further encrypted information may be decrypted with the session enclave private key.

**Title:** ENCLAVE POOL SHARED KEY**Priority:** US20170592802 20170511

Family:	Publication number	Publication date	Application number	Application date
	US2018330078 AA	20181115	US20170592802	20170511
	WO18208426 A1	20181115	WO2018US27210	20180412

Probable Assignee: MICROSOFT CORP**Assignee(s):(std):** MICROSOFT TECHNOLOGY LICENSING LLC**Assignee(s):** MICROSOFT CORP**Inventor(s):(std):** GRAY JOHN MARLEY**Agent(s):** MINHAS SANDIP S ET AL**Designated states:** AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DJ DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JO JP KE KG KH KM KN KP KR KW KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG

MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC
SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

International class (IPC 8-9): G06F21/53 G06F21/71 H04L9/08 H04L9/32 (Advanced/Invention)

CPC: G06F21/53 H04L9/3268 H04L9/0861 H04L9/3247 G06F21/71

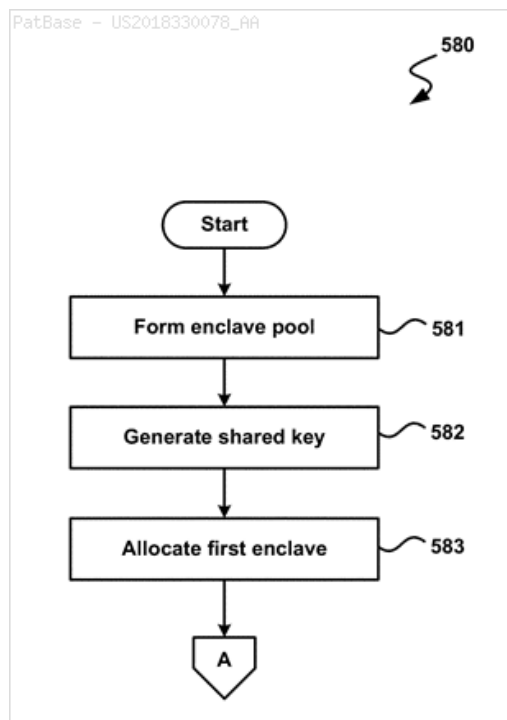
US class: 1/1 713/189

[Classification Explorer](#)

Cited documents: WO18090012 A1, US2015347768 AA,

Abstract:

In one example, an enclave pool is formed. The enclave pool may include a plurality of enclaves. Each enclave may have a private enclave key and a public enclave key. A shared enclave pool key may be generated from or otherwise based on the public enclave key of each enclave of the enclave pool. A first enclave may be allocated from the enclave pool to a first cryptlet. A payload of the first enclave is received. The payload of the first enclave may be signed with a first digital signature by the private enclave key of the first enclave. A payload of the second enclave may be received. The payload of the second enclave may be signed with a second digital signature by the private enclave key of the second enclave. The first digital signature and the second signature may be validated via the shared enclave pool key.



15) Family number: 71883851 (US2018330079A)

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Title: ENCLAVE POOL MANAGEMENT

Priority: US20170592867 20170511

Family:

Publication number	Publication date	Application number	Application date
US2018330079 AA	20181115	US20170592867	20170511
WO18208427 A1	20181115	WO2018US27211	20180412

Probable Assignee: MICROSOFT CORP

Assignee(s):(std): MICROSOFT TECHNOLOGY LICENSING LLC

Assignee(s): MICROSOFT CORP

Inventor(s):(std): GRAY JOHN MARLEY

Agent(s): MINHAS SANDIP S ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DJ DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JO JP KE KG KH KM KN KP KR KW KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

International class (IPC 8-9): G06F21/53 G06F21/60 H04L29/06 H04L9/08 H04L9/32 (Advanced/Invention)

CPC: G06F21/53 H04L9/3247 H04L9/0894 H04L9/0891 H04L9/0861 G06F21/602 H04L63/065 H04L63/123

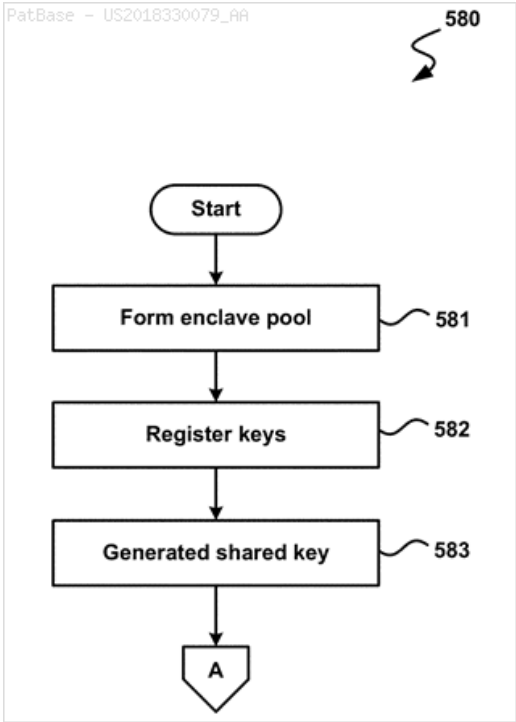
US class: 1/1 713/189

[Classification Explorer](#)

Cited documents: US2017048217 AA, US2015347768 AA,

Abstract:

The public enclave key of each enclave in an enclave pool may be registered in an enclave pool registry, and the registry updated each time there is an enclave pool membership change. A shared enclave pool key may be derived from the public enclave key of each enclave of the enclave pool. The shared enclave pool key may be stored, in a shared key ledger, as a first version of the shared enclave key, and an updated version of the shared key may be generated and stored as another version each time there is an enclave pool membership change. The output of a cryptlet that executed in multiple enclaves may be signed with the enclave private key of each enclave in which the cryptlet executed. Each enclave signature may be compared against each version of the of the shared enclave pool key in the shared key ledger.



16) Family number: 75751992 (US2019272186A)

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Title:

Priority:

Family:

Probable Assignee:

Assignee(s):(std):

Assignee(s):

Inventor(s):(std):

Inventor(s):

Agent(s):

Designated states:

International class (IPC 8-9):

CPC:

Classification Explorer

Cited documents:

VIEW AUGMENTATION IN MULTISCREEN ENVIRONMENT

US20180912369 20180305

Publication number	Publication date	Application number	Application date
US2019272186 AA	20190905	US20180912369	20180305
WO19173054 A1	20190912	WO2019US18854	20190221

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MICROSOFT TECHNOLOGY LICENSING LLC

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GROCHOCKI JR DAVID ; OTERO DIAZ ANA LILIA ; SETHI KSHITIJ ; WEST JEFF ; ANDREW FELIX ; GROCHOCKI DAVID ; OTERO DIAZ ANA

GROCHOCKI JR ; GROCHOCKI DAVID JR

MINHAS SANDIP S ET AL

AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DJ DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JO JP KE KG KH KM KN KP KR KW KZ LA LC LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

G01C21/36 G06F1/16 G06F3/14 G06F9/451 G06F9/46 G09G5/00 G09G5/14 (Advanced/Invention)

G06F9/452 G06F3/1446 G06F9/461 G06F3/1423 G09G5/003 G09G2356/00 G09G2380/02 G01C21/3679 G06F1/1616 G06F1/1641

WO18010366 A1, US2018007099 AA, US2016259840 AA, US2016205427 AA, US2015362325 AA, US2015312633 AA, US2012081270 AA, US2006200834 AA, US2005003804 AA, EP3487147 A1,

Abstract:
The disclosed technology is generally directed to multiscreen environments. In one example of the technology, a registry is maintained. The registry includes a plurality of context schemas. Each context schema in the plurality of context schemas includes a context schema input and a context schema output. Context data is received from a first application. The context data includes at least one of a context schema input that is associated with view augmentation in a multiscreen environment or a context schema output that is associated with view augmentation in a multiscreen environment. It is determined whether the context data is valid based, at least in part, on the registry. In response to determining that the context data is valid, the context data is forwarded to at least a second application. The second application is separate from the first application.

