CLAIMS

1. A distributed ledger system comprising:

a network of computing devices including at least one group of user nodes in communication with one another to participate in transacting and recording transactions in an associated blockchain, at least one user node in the group being initiated and operable via an instance of one or more web-application(s) running in a web-browser executed by one or more associated computing device(s),

the web-application(s) being configured to initiate and operate an associated user node to participate in transacting and recording transactions for at least one blockchain of at least one group of user nodes by:

obtaining a node address for the associated user node for each blockchain that the user node is configured to participate in, the node address including an indication of the associated blockchain;

requesting data indicative of a current iteration of the blockchain from the group of user nodes and storing the current iteration of the blockchain in electronic memory of the computing device(s) associated with the user node,

for at least one blockchain that the user node is configured to participate in; and

enabling the associated user node to:

communicate with the group of user nodes to participate in transactions with the group of user nodes, for at least one blockchain that the user node is configured to participate in, and

carry out one or more blockchain-related tasks including creating, updating and/or maintaining the blockchain based on the transactions between the group of user nodes, for at least one

blockchain that the user node is configured to participate in; and

wherein the network of computing devices enable at least one ephemeral user node of at least one group of user nodes to temporarily join and operate within the group of user nodes by

initiating a temporary instance of the respective web application(s), the blockchain(s) associated with the group of user nodes remaining active after the temporary instance of the respective web application(s) is terminated.

2. A system as claimed in claim 1 wherein the network of computing devices is operable to enable the at least one ephemeral user node to temporarily join and operate within the group of user nodes and to rejoin and operate within the group of user nodes during multiple independent instances of the respective web application(s).

3. A system as claimed in claim 1 or claim 2 wherein the at least one user node in at least one of the group(s) of user nodes is configured to obtain executable code from associated computer-readible medium to perform the one or more blockchain-related tasks.

4. A system as claimed in claim 3 wherein the at least one user node in at least one of the group(s) of user nodes is configured to communicate with the network of computing devices to obtain the executable code using an address location within a blockchain of the system.

5. A system as claimed in claim 4 wherein the at least one user node of at least one of the group(s) of user nodes is configured to access and execute the blockchain-related tasks using a webAssembly container.

6. A system as claimed in claim 4 or claim 5 wherein the networking of computing devices includes a server and a database, and the at least one user node in at least one of the group(s) of user node is configured to access and execute the blockchain related tasks by communicating with the server and the database.

7. A system as claimed in any one of the preceding claims wherein all user nodes in at least one of the group(s) of user nodes are ephemeral nodes.

8. A system as claimed in any one of the preceding claims wherein at least one user node in at least one of the group(s) of user nodes is configured to obtain data indicative of the current iteration of a blockchain from corresponding peer user nodes in the group of user nodes, for enabling the execution of the blockchain-related task(s).

9. A system as claimed in claim 8 wherein the data indicative of the current iteration of a blockchain is a most recent block or most recent blocks of the blockchain.

10. A system as claimed in any one of the preceding claims wherein at least one ephemeral user node is a full-node operable to execute a mining task of the blockchain-related tasks for selecting a node within the associated group of user nodes to write a next validated block to the associated blockchain.

11. A system as claimed in claim 10 wherein the mining task is operative using a proof-of-stake method.

12. A system as claimed in any one of the preceding claims wherein at least one ephemeral node is a light node that is not operable to execute a mining task of the blockchain-related tasks.

13. A system as claimed in any one of the preceding claims wherein the user nodes of at least one of group(s) of user nodes are capable of communicating with one another via a peer-to-peer communications protocol.

14. A system as claimed in claim 13 wherein the peer-to-peer communication is facilitated by webRTC.

15. A system as claimed in any one of the preceding claims wherein the network of computing devices is configured to verify a predetermined user identity associated with a user node prior to the user node establishing communication with the remaining user nodes in a group of user nodes, for the purposes of carrying out one or more blockchain-related tasks.

16. A system as claimed in claim 15 wherein verifying the predetermined user identity comprises a two-factor authentication process.

17. A system as claimed in claim 16 wherein the two-factor authentication process includes a biometric identification stage wherein a predetermined biometric characteristic of a user associated with the user node is verified.

18. A system as claimed in any one of the preceding claims wherein the node address is temporary for the at least one ephemeral user node.

19. A system as claimed in claim 2 wherein the at least one ephemeral user node is configured to obtain a new node address different to a previous node address for an associated blockchain when the node re-joins a group of user nodes.

20. A system as claimed in any one of the preceding claims wherein the at least one user node of at least one of the group(s) of user nodes includes a unique node address for each blockchain associated with the node.

21. A system as claimed in any one of the preceding claims wherein the network of computing devices is configured to associate a pair of public and private keys to a user of a node address for use in encrypting and decrypting transactions associated with a user of a blockchain upon the associated node joining the network for the purposes of participating in the blockchain.

22. A system as claimed in any one of the preceding claims wherein the network of computing devices are operable to create, update and maintain multiple blockchains.

23. A system as claimed in any one of the preceding claims wherein each user node in at least one of the group(s) of user nodes is associated with a user identification or address and wherein the user identification or address is utilised in transactions associated with the user node to identify the associated user.

24. A system as claimed in any one of the preceding claims wherein the transactions between the group of user nodes comprises an exchange of data including any combination of one or more of: text data, image data, audio data and/or video data.

25. A system as claimed in any one of the preceding claims wherein at least one user node in at least one of the group(s) of user nodes is configured to obtain a parent node address and at least one other user node in the group of user nodes is configured to obtain a child node address that includes data indicative of the parent node address.

26. A system as claimed in any one of the preceding claims wherein at least one user node of at least one of the group(s) of user nodes is operative to require authorisation of a transaction

from one or more other user nodes within the group of nodes prior to broadcasting the transaction for recording on the associated blockchain.

27. A system as claimed in claim 25 wherein the at least one other user node in the group of user nodes is operative to authorize a transaction from the at least one user node prior to broadcasting the transaction for recording on the associated blockchain.

28. A system as claimed in any one of the preceding claims wherein the network of computing devices is configured to allocate a static user identify to each user node in at least one of the group(s) of user nodes upon joining the group of user nodes for the first time.

29. A system as claimed in claim 28 wherein the network of computing devices is configured to allocate a new virtual user identity differing from the static user identify to each of the at least one ephemeral nodes in at least one of the group(s) of user nodes every time the ephemeral user node rejoins the network of computing devices.

30. A system as claimed in claim 29 wherein the new virtual user identify differs from a previously allocated virtual user identity.

31. A system as claimed in any one of claim 29 or claim 30 wherein the network of computing devices is configured to allocate a new virtual user identity differing from the static user identity to each user node in at least one of the group(s) of user nodes for every transaction associated with the user node.

32. A system as claimed in any one of the preceding claims wherein the network of computing devices includes at least two groups of user nodes that are configured to operate and maintain a first blockchain and a second blockchain, the first group of user nodes operating to facilitate verification, input, storage, extraction and manipulation of data by the group of user nodes and the second group of user nodes monitoring the operation of the user nodes in the first group of user nodes to determine behavior status of the user nodes in the first group of user nodes and storing data indicative of the behavior status in the second blockchain.

33. A method for maintaining at least one blockchain stored in a distributed ledger system, the method comprising:

enabling communication between a network of computing devices including at least one group of user nodes in communication with one another to participate in transacting and recording the transactions in an associated blockchain,

enabling at least one user node in at least one of the group(s) of user nodes to be initiated and operable via an instance of one or more web-application(s) running in a web-browser executed by one or more associated computing device(s),

the web-application(s) being configured to initiate and operate an associated user node to participate in transacting and recording transactions for at least one blockchain of at least one group of user nodes by:

obtaining a node address for the associated user node for each blockchain that the user node is configured to participate in, the node address including an indication of the associated blockchain;

requesting data indicative of a current iteration of the blockchain from the group of user nodes and storing the current iteration of the blockchain in electronic memory of the computing device(s) associated with the user node, for at least one blockchain that the user node is configured to participate in; and

enabling the associated user node to:

communicate with the group of user nodes to participate in transactions with the group of user nodes, for at least one blockchain that the user node is configured to participate in, and carry out one or more blockchain-related tasks including creating, updating and/or maintaining the blockchain based on the transactions between the group of user nodes, for at least one blockchain that the user node is configured to participate in; and

enabling at least one ephemeral user node of at least one group of user nodes to temporarily join and operate within the group of user nodes by initiating a temporary instance of the respective web application(s), the blockchain(s) associated with the group of user nodes remaining active after the temporary instance of the respective web application(s) is terminated.

34. A method as claimed in claim 33 wherein further comprising enabling the at least one ephemeral user node to temporarily join and operate within the group of user nodes and to rejoin and operate within the group of user nodes during multiple independent instances of the respective web application(s).

35. A method as claimed in claim 33 or claim 34 wherein further comprising enabling the at least one user node in at least one of the group(s) of user nodes to obtain executable code from associated computer-readible medium to perform the one or more blockchain-related tasks.

36. A method as claimed in claim 35 wherein further comprising enabling the at least one user node in at least one of the group(s) of user nodes to communicate with the network of computing devices to obtain the executable code using an address location within a blockchain of the system.

37. A method as claimed in claim 36 further comprising enabling the at least one user node of at least one of the group(s) of user nodes to access and execute the blockchain-related tasks using a webAssembly container.

38. A method as claimed in claim 36 or claim 37 further comprising enabling the at least one user node in at least one of the group(s) of user nodes to access and execute the blockchain related tasks by communicating with a server and a database.

39. A method as claimed in any one of claim 33 to claim 38 wherein all user nodes in at least one of the group(s) of user nodes are ephemeral nodes.

40. A method as claimed in any one of claim 33 to claim 39 wherein at least one user node in at least one of the group(s) of user nodes is configured to obtain data indicative of the current iteration of a blockchain from corresponding peer user nodes in the group of user nodes, for enabling the execution of the blockchain-related task(s).

41. A method as claimed in claim 40 wherein the data indicative of the current iteration of a blockchain is a most recent block or most recent blocks of the blockchain.

42. A method as claimed in any one of claim 33 to claim 41 wherein at least one ephemeral user node is a full-node operable to execute a mining task of the blockchain-related tasks for selecting a node within the associated group of user nodes to write a next validated block to the associated blockchain.

43. A method as claimed in claim 42 wherein the mining task is operative using a proof-of-stake method.

44. A method as claimed in any one of claim 33 to claim 43 wherein at least one ephemeral node is a light node that is not operable to execute a mining task of the blockchain-related tasks.

45. A method as claimed in any one of claim 33 to claim 44 further comprising enabling the user nodes of at least one of group(s) of user nodes to communicate with one another via a peer-to-peer communications protocol.

46. A method as claimed in claim 45 wherein the peer-to-peer communication is facilitated by webRTC.

47. A method as claimed in any one of claim 33 to claim 45 further comprising verifying a predetermined user identity associated with a user node prior to the user node establishing communication with the remaining user nodes in a group of user nodes, for the purposes of carrying out one or more blockchain-related tasks.

48. A method as claimed in claim 47 wherein verifying the predetermined user identity comprises a two-factor authentication process.

49. A method as claimed in claim 48 wherein the two-factor authentication process includes a biometric identification stage wherein a predetermined biometric characteristic of a user associated with the user node is verified.

50. A method as claimed in any one of claim 33 to claim 50 wherein the node address is temporary for the at least one ephemeral user node.

51. A method as claimed in claim 34 further comprising enabling the at least one ephemeral user node to obtain a new node address different to a previous node address for an associated blockchain when the node re-joins a group of user nodes.

52. A method as claimed in any one of claim 33 to claim 51 wherein the at least one user node of at least one of the group(s) of user nodes includes a unique node address for each blockchain associated with the node.

53. A method as claimed in any one of claim 33 to claim 52 further comprising associating a pair of public and private keys to a user of a node address for use in encrypting and decrypting transactions associated with a user of a blockchain upon the associated node joining the network for the purposes of participating in the blockchain.

54. A method as claimed in any one of claim 33 to claim 53 further comprising enabling the network of computing devices to create, update and maintain multiple blockchains.

55. A method as claimed in any one of claim 33 to claim 54 wherein each user node in at least one of the group(s) of user nodes is associated with a user identification or address and wherein the user identification or address is utilised in transactions associated with the user node to identify the associated user.

56. A method as claimed in any one of claim 33 to claim 55 wherein the transactions between the group of user nodes comprises an exchange of data including any combination of one or more of: text data, image data, audio data and/or video data.

57. A method as claimed in any one of claim 33 to claim 56 further comprising enabling at least one user node in at least one of the group(s) of user nodes to obtain a parent node address and at least one other user node in the group of user nodes to obtain a child node address that includes data indicative of the parent node address.

58. A method as claimed in any one claim 33 to claim 57 further comprising authorising a transaction of at least one user node of at least one of the group(s) of user by one or more other user nodes within the group of nodes prior to broadcasting the transaction for recording on the associated blockchain.

59. A method as claimed in claim 58 wherein the at least one other user node in the group of user nodes is authorises a transaction from the at least one user node prior to broadcasting the transaction for recording on the associated blockchain.

60. A method as claimed in any one of claim 33 to claim 59 further comprising allocating a static user identify to each user node in at least one of the group(s) of user nodes upon joining the group of user nodes for the first time.

61. A method as claimed in claim 60 further comprising allocating a new virtual user identity differing from the static user identify to each of the at least one ephemeral nodes in at least one of the group(s) of user nodes every time the ephemeral user node rejoins the network of computing devices.

62. A method as claimed in claim 61 wherein the new virtual user identify differs from a previously allocated virtual user identity.

63. A method as claimed in any one of claim 61 or claim 62 further comprising allocating a new virtual user identity differing from the static user identity to each user node in at least one of the group(s) of user nodes for every transaction associated with the user node.

64. A method as claimed in any one of claim 33 to claim 63 further comprising enabling at least two groups of user nodes to operate and maintain a first blockchain and a second blockchain, the first group of user nodes operating to facilitate verification, input, storage, extraction and manipulation of data by the group of user nodes and the second group of user nodes monitoring the operation of the user nodes in the first group of user nodes to determine behavior status of the user nodes in the first group of user nodes and storing data indicative of the behavior status in the second blockchain.