CLAIMS

1. A decentralized content-centric system comprising:

one or more memory devices; and

one or more processors in communication with the one or more memory devices, the one or more processors configured to execute software to provide an overlay network implemented in an application layer differentiated from an internet protocol layer, the overlay network configured to manage a plurality of content object parts representing digital content, each content object part comprising raw data, metadata, and build instructions, the overlay network comprising:

a data layer storing the raw data and the metadata of the content object parts,

a code layer storing the build instructions of the content object parts,

a contract layer storing a digital contract associated with the content object parts, and

one or more interfaces;

the overlay network further configured to:

generate digital output by at least processing the build instructions stored in the code layer and the digital contract stored in the contract layer in relation to the raw data and the metadata stored in the data layer, and

provide, using the one or more interfaces, the digital output to a client.

2. The system of claim 1, the contract layer configured to control one or more of a plurality of trustless security operations associated with a ledger, the trustless security operations comprising one or more of: encryption of content, proxy re-encryption of content, or content access authorization associated with one or more content transactions recorded in the ledger.

3. The system of claim 2, wherein the ledger is a blockchain of the overlay network.

4. The system of claim 2, wherein the digital contract is configured to record operations on the content object parts as respective transactions.

5. The system of claim 4, wherein a transaction identifies one or more of: an address of an entity requesting an operation, an identifier of a content object part, or transaction data.

6. The system of claim 1, wherein the software is executed by each of a plurality of processors to provide a plurality of fabric nodes of the overlay network, each fabric node configured to communicate with other fabric nodes to receive, manage and output digital content to provide a decentralized framework.

7. A computing device of a decentralized content-centric system, the computing device comprising:

a memory device; and

one or more processors in communication with the memory device, the one or more processors configured to execute software to provide a fabric node of a plurality of fabric nodes of an overlay network implemented in an application layer differentiated from an internet protocol layer, the overlay network configured to manage a plurality of content object parts representing digital content, each content object part comprising raw data, metadata, and build instructions, the provided fabric node configured to:

obtain, from a client, a request for digital content,

obtain, from one or more of the plurality fabric nodes, the content object parts,

generate digital output by at least processing a digital contract associated with the content object parts and the build instructions stored in the content object parts in relation to the raw data and the metadata stored in the content object parts, and

provide the digital output to the client.

8. The computing device of claim 7, the provided fabric node further configured to store a content object part in the memory device.

9. The computing device of claim 7, the provided fabric node further configured to provide the digital contract as a blockchain smart contract.

10. The computing device of claim 9, wherein the digital contract is stored with associated identifiers of different versions of a contract object part in a ledger.

11. The computing device of claim 10, the provided fabric node further configured to:

generate a version proof for the content object part using a hash tree,

verify the version proof, and

store the version proof in association with the digital contract in the ledger.

12. The computing device of claim 7, wherein the raw data, metadata and build instructions are configured to be processed to generate the digital output using just-in-time (JIT) processing.

13. The computing device of claim 12, wherein the digital contract is configured to record the JIT processing.

14. The computing device of claim 7, wherein a translation layer is situated between the application layer and the internet protocol layer, the translation layer configured to provide communications between the application layer and the internet protocol layer.

15. A non-transitory computer-readable medium storing program code of software to be implemented using one or more memory devices and to be executed by one or more processors in communication with the one or more memory devices, the program code comprising instructions configured to cause:

providing an overlay network implemented in an application layer differentiated from an internet protocol layer, the overlay network configured to manage a plurality of content object parts representing digital content, each content object part comprising raw data, metadata, and build instructions, the overlay network comprising:

a data layer storing the raw data and the metadata of the content object parts,

a code layer storing the build instructions of the content object parts, and

a contract layer storing a digital contract associated with the content object parts;

generating digital output by at least processing the build instructions stored in the code layer and the digital contract stored in the contract layer in relation to the raw data and the metadata stored in the data layer; and

providing the digital output to a requesting client.

16. The non-transitory computer-readable medium of claim 15, the contract layer configured to control one or more of a plurality of trustless security operations associated with a ledger, the trustless security operations comprising one or more of: encryption of content, proxy re-encryption of content, or content access authorization associated with one or more content transactions recorded in the ledger.

17. The non-transitory computer-readable medium of claim 16, wherein the ledger is a blockchain of the overlay network.

18. The non-transitory computer-readable medium of claim 15, wherein the digital contract is configured to record operations on the content object parts as respective transactions.

19. The non-transitory computer-readable medium of claim 18, wherein a transaction identifies one or more of: an address of an entity requesting an operation, an identifier of a content object part, or transaction data.

20. A non-transitory computer-readable medium storing program code of software to be implemented using one or more memory devices and to be executed by one or more processors in communication with the one or more memory devices, the program code comprising instructions configured to cause:

providing a fabric node of a plurality of fabric nodes of an overlay network implemented in an application layer differentiated from an internet protocol layer, the overlay network configured to manage a plurality of content object parts representing digital content, each content object part comprising raw data, metadata, and build instructions, the provided fabric node configured to:

obtain, from a client, a request for digital content,

obtain, from one or more of the plurality fabric nodes, the content object parts,

generate digital output by at least processing a digital contract associated with the content object parts and the build instructions stored in the content object parts in relation to the raw data and the metadata stored in the content object parts; and

providing the digital output to the client.

21. The non-transitory computer-readable medium of claim 20, the provided fabric node further configured to store a content object part in the one or more memory devices.

22. The non-transitory computer-readable medium of claim 20, the provided fabric node further configured to provide the digital contract as a blockchain smart contract.

23. The non-transitory computer-readable medium of claim 22, wherein the digital contract is stored with associated identifiers of different versions of a contract object part in a ledger.

24. The non-transitory computer-readable medium of claim 23, the provided fabric node further configured to:

generate a version proof for the content object part using a hash tree,

verify the version proof, and

store the version proof in association with the digital contract in the ledger.

25. The non-transitory computer-readable medium of claim 20, wherein the raw data, metadata and build instructions are configured to be processed to generate the digital output using just-in-time (JIT) processing.

26. The non-transitory computer-readable medium of claim 25, wherein the digital contract is configured to record the JIT processing.