

CLAIMS

1. A computer-implemented method for invoking a smart contract, comprising:
receiving a target transaction that is used to initiate an invocation of the smart contract,
wherein the target transaction comprises invocation data, wherein the invocation data comprises
a data digest associated with target data, wherein the target data is stored in a third-party storage
system interconnected with a first blockchain, and wherein the third-party storage system is a
second blockchain that has a cross-chain data reference relationship that maps a relationship
between the data digest and the target data;

querying the target data associated with the data digest from the third-party storage
system with a query request, wherein the query request comprises a block number identifying a
block of the second blockchain that stores the target data;

receiving a query result returned by the third-party storage system, wherein the query
result comprises the target data;

performing a content verification on the target data, comprising:

computing an additional data digest associated with the target data based on a
predetermined digest algorithm; and

determining that the additional data digest is consistent with the data digest associated
with the target data;

determining that the content verification on the target data succeeds;

in response to determining that the content verification on the target data succeeds,
invoking the smart contract to perform a smart contract computation on the target data and the
invocation data included in the target transaction; and

storing a computation result from the smart contract computation in a distributed database
associated with the first blockchain after the smart contract computation is completed.

2. The computer-implemented method of claim 1, wherein the first blockchain is
within a consortium blockchain, and wherein the third-party storage system comprises a content
addressable storage (CAS) platform that provides a data storage service for the first blockchain.

3. The computer-implemented method of claim 2, wherein the second blockchain is within the consortium blockchain.

4. The computer-implemented method of claim 1, wherein the third-party storage system stores a mapping relationship between the target data and the data digest associated with the target data.

5. The computer-implemented method of claim 4, wherein querying the target data associated with the data digest from the third-party storage system comprises:

initiating a query to the third-party storage system by using the data digest as a query index for the target data.

6. The computer-implemented method of claim 1, wherein the third-party storage system comprises a centralized content addressable storage system, a decentralized distributed system, or a combination thereof.

7. A non-transitory, computer-readable medium storing one or more instructions executable by a computer system to perform operations comprising:

receiving a target transaction that is used to initiate an invocation of a smart contract, wherein the target transaction comprises invocation data, wherein the invocation data comprises a data digest associated with target data, wherein the target data is stored in a third-party storage system interconnected with a first blockchain, and wherein the third-party storage system is a second blockchain that has a cross-chain data reference relationship that maps a relationship between the data digest and the target data;

querying the target data associated with the data digest from the third-party storage system with a query request, wherein the query request comprises a block number identifying a block of the second blockchain that stores the target data;

receiving a query result returned by the third-party storage system, wherein the query result comprises the target data;

performing a content verification on the target data, comprising:

computing an additional data digest associated with the target data based on a predetermined digest algorithm; and

determining that the additional data digest is consistent with the data digest associated with the target data;

determining that the content verification on the target data succeeds;

in response to determining that the content verification on the target data succeeds, invoking the smart contract to perform a smart contract computation on the target data and the invocation data included in the target transaction; and

storing a computation result from the smart contract computation in a distributed database associated with the first blockchain after the smart contract computation is completed.

8. The non-transitory, computer-readable medium of claim 7, wherein the first blockchain is within a consortium blockchain, and wherein the third-party storage system comprises a content addressable storage (CAS) platform that provides a data storage service for the first blockchain.

9. The non-transitory, computer-readable medium of claim 8, wherein the second blockchain is within the consortium blockchain.

10. The non-transitory, computer-readable medium of claim 7, wherein the third-party storage system stores a mapping relationship between the target data and the data digest associated with the target data.

11. The non-transitory, computer-readable medium of claim 10, wherein querying the target data associated with the data digest from the third-party storage system comprises:

initiating a query to the third-party storage system by using the data digest as a query index for the target data.

12. The non-transitory, computer-readable medium of claim 7, wherein the third-party storage system comprises a centralized content addressable storage system, a decentralized distributed system, or a combination thereof.

13. A computer-implemented system, comprising:
one or more computers; and
one or more computer memory devices interoperably coupled with the one or more computers and having tangible, non-transitory, machine-readable media storing one or more instructions that, when executed by the one or more computers, perform one or more operations comprising:

receiving a target transaction that is used to initiate an invocation of a smart contract, wherein the target transaction comprises invocation data, wherein the invocation data comprises a data digest associated with target data, wherein the target data is stored in a third-party storage system interconnected with a first blockchain, and wherein the third-party storage system is a second blockchain that has a cross-chain data reference relationship that maps a relationship between the data digest and the target data;

querying the target data associated with the data digest from the third-party storage system with a query request, wherein the query request comprises a block number identifying a block of the second blockchain that stores the target data;

receiving a query result returned by the third-party storage system, wherein the query result comprises the target data;

performing a content verification on the target data, comprising:

computing an additional data digest associated with the target data based on a predetermined digest algorithm; and

determining that the additional data digest is consistent with the data digest associated with the target data;

determining that the content verification on the target data succeeds;

in response to determining that the content verification on the target data succeeds, invoking the smart contract to perform a smart contract computation on the target data and the invocation data included in the target transaction; and

storing a computation result from the smart contract computation in a distributed database associated with the first blockchain after the smart contract computation is completed.

14. The computer-implemented system of claim 13, wherein the first blockchain is within a consortium blockchain, and wherein the third-party storage system comprises a content addressable storage (CAS) platform that provides a data storage service for the first blockchain.

15. The computer-implemented system of claim 14, wherein the second blockchain is within the consortium blockchain.

16. The computer-implemented system of claim 13, wherein the third-party storage system stores a mapping relationship between the target data and the data digest associated with the target data.

17. The computer-implemented system of claim 16, wherein querying the target data associated with the data digest from the third-party storage system comprises:

initiating a query to the third-party storage system by using the data digest as a query index for the target data.