

CLAIMS

1. A computer-implemented method comprising:
 - determining, by a storage system from an index log file, information of a data log file stored in a storage device, wherein the data log file comprises one or more of block data, transaction data, or state data generated by a blockchain network;
 - determining whether the data log file needs a rewritten placement based on the information of the data log file stored in the storage device; and
 - in response to determining that the data log file needs a rewritten placement,
 - determining a source storage location of the data log file;
 - reading the data log file from the source storage location;
 - rewriting the data log file to a destination storage location; and
 - generating a destination index log file that indicates the destination storage location corresponding to the data log file.
2. The computer-implemented method of claim 1, wherein the data log file is an append-only file comprising one or more of block data, transaction data, or state data appended according to a chronological order of the one or more of block data, transaction data, or state data generated by the blockchain network.
3. The computer-implemented method of claim 1, wherein the data log file is read-only file stored in a first-tier storage device in a multi-tier storage subsystem of the storage system that comprises a plurality of tiers of storage devices, and the first-tier storage device has a highest access speed among the plurality of tiers of storage devices.
4. The computer-implemented method of claim 1, wherein the index log file is read-only file stored in a first-tier storage device in a multi-tier storage subsystem of the storage system that comprises a plurality of tiers of storage devices, and the first-tier storage device has a highest access speed among the plurality of tiers of storage devices.
5. The computer-implemented method of claim 1, wherein the information of the data log file in the storage device comprises one or more of:

an activeness, a size, a garbage ratio, or a fragmentation level of the data log file.

6. The computer-implemented method of claim 1, further comprising:
determining information of the storage device, wherein the information of the storage device comprises one or more of a usage, a garbage ratio, a fragmentation level, or an input/output (I/O) request of the storage device; and
wherein determining whether the data log file needs a rewritten placement based on the information of the data log file stored in the storage device comprises determining whether the data log file needs a rewritten placement based on the information of the data log file stored in the storage device and the information of the storage device.
7. The computer-implemented method of claim 1, wherein the rewritten placement comprises one or more of: tiering, compressing, erasure coding, state snapshot, compaction, or verification.
8. The computer-implemented method of claim 1, further comprising sealing the data log file in the destination location after rewriting the data log file to the destination storage location.
9. The computer-implemented method of claim 1, wherein the destination index log file comprises an indicator of the data log file stored in the source storage location.
10. An apparatus for data processing, the apparatus comprising a plurality of modules for performing the computer-implemented method of any one of claims 1 to 9.
11. A system for data processing, comprising:
one or more processors; and
one or more computer-readable memories coupled to the one or more processors and having instructions stored thereon that are executable by the one or more processors to perform the computer-implemented method of any one of claims 1 to 9.