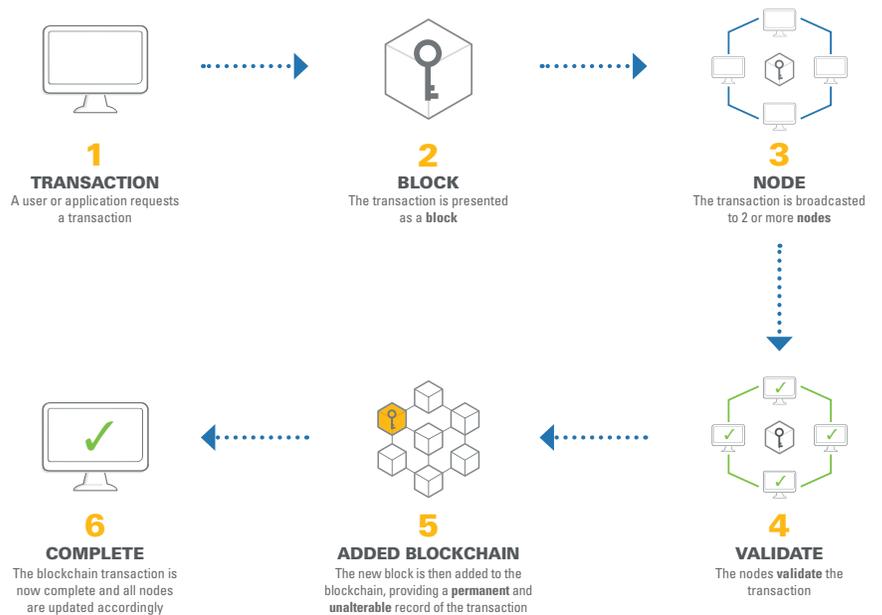


# ASSUREON<sup>®</sup> PRIVATE BLOCKCHAIN

## BLOCKCHAIN-BASED SECURE TRANSACTIONS

In simplest terms, a blockchain is a sequence of time-stamped records (or transactions) organized in blocks. These blocks of transactions are linked together using cryptographic principles, in order to protect the integrity of the transactions, and make it evident if tampering has occurred.

When a block of transactions is first added to a blockchain, each subsequent block in the chain uses the previous block's fingerprint to calculate its own fingerprint. Before a new block can be added to the chain, its authenticity is verified by a consensus algorithm, whereby all nodes participating in the blockchain must agree on the new block's validity. In a nutshell, this consensus algorithm ensures that all copies of the blockchain share the same state.



Since all transactions in a blockchain are chained together, each transaction is immutable. It's impossible to alter a previous transaction without changing the copy of every participant in the blockchain. In other words, once a record is added to a blockchain, it cannot be changed or removed.

The first major usage of a blockchain was in Bitcoin, but many non-cryptocurrency applications and systems that leverage blockchain technology exist today. These blockchain-based systems enable organizations to protect and secure digital assets.

Nexsan Assureon<sup>®</sup> with its Private Blockchain technology is one of those systems.



## CONCLUSION

Assureon Private Blockchain provides traceability, immutability and visibility of digital assets. Combined with Nexsan Assureon's unique file fingerprinting and asset serialization process, with metadata authentication and a robust consensus algorithm, Assureon Private Blockchain allows you to securely archive your digital assets for long term data protection, retention and compliance adherence.

## ABOUT NEXSAN

Nexsan® is a global enterprise storage leader since 1999 delivering the most reliable, cost-effective and highly efficient storage solutions. Nexsan's solution portfolio empowers enterprises to securely store, protect and manage valuable business data with a broad product line of all-flash NVMe, unified storage, block storage, and secure archiving. Nexsan is a proud member of the StorCentric Family. [www.nexsan.com](http://www.nexsan.com)

## SO, WHAT IS ASSUREON PRIVATE BLOCKCHAIN?

There are three important tenets to what constitutes Assureon's Private Blockchain technology:

### 1. It's an append-only and immutable data structure.

This means you can only append new data in the form of additional blocks, which will then be chained together with previous blocks of data. All data is permanently stored across 2 or more nodes and cannot be altered.

Assureon validates file integrity during ingestion, replication, and continuously during each file's life-cycle. Whenever Nexsan Assureon ingests a file, it stores the file and other metadata in a cryptographically chained linked list prior to replicating to a redundant Assureon appliance in a second location. Approximately every 90 days, Assureon provides an automatic integrity audit at both redundant sites, where it walks the serial number list making sure that every stored file exists, is readable, and still matches its separately stored cryptographic hashes. Any corrupted or missing files are quarantined and automatically self-healed from a known good copy on the partner system. This ensures the immutability of all digital assets within the Assureon object store.

### 2. It uses cryptography to secure transactions.

Blockchain technology relies on a cryptographic hash function to turn data into a fingerprint of that data called a hash. This ensures that it is infeasible to calculate back the original data from the hash, and if the data slightly changes the hash also changes. Therefore, it becomes computationally impractical for individuals with malicious intent to manipulate data that are stored in a blockchain. In general, cryptography is the basis of the security and immutability of blockchain technology.

Nexsan Assureon applies a globally-unique serial number to each file it ingests, calculates a pair of cryptographic hashes or fingerprints, and assigns a unique AES256 encryption key if desired to each file. It then stores this and other metadata in a cryptographically chained linked list across two redundant nodes.

### 3. It relies on a consensus mechanism to maintain data integrity and transparency.

As previously mentioned, Nexsan Assureon provides an automatic integrity audit at both redundant sites, whereby both sites provide consensus to ensure that every file in the object store exists, is readable, and matches cryptographic hashes stored at each site. If any file is discovered to be corrupted or missing, it is immediately quarantined and automatically self-healed from a known good copy on the partner system.