



## Feature comparison QLDB vs ProvenDB



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# ProvenDB and Amazon QLDB comparison

## Overview

This document provides a comparison between ProvenDB and Amazon's Quantum Ledger Database (QLDB). It's intended for those evaluating the two systems' suitability for their specific needs.

The information provided with respect of ProvenDB was current as of October 2021. Information regarding QLDB was based on Amazon's published documentation as of the same date and from various evaluations performed by the ProvenDB team over the past two years. While every effort has been made to provide a fair and accurate comparison, the ProvenDB team are not privy to QLDB source code or design artifacts, and therefore, the possibility of inadvertent inaccuracies exists.

At a high level, both ProvenDB and QLDB share similar objectives: to provide cryptographic certainty of integrity and history while maintaining the functionality and performance characteristics of existing databases. Both support the following key capabilities:

- You can view previous versions of documents and data elements.
- You can validate that an element has not been tampered with using cryptographic techniques.
- You can determine the creation or modification date of any data element using cryptographic techniques.

While there are numerous implementation differences between the two platforms, we'd argue that the key differentiator between the two systems relates to the *source of trust*.

- QLDB relies on Amazon itself to guarantee immutability. QLDB writes to a built-in immutable journal. The immutability of this journal is guaranteed by Amazon's infrastructure, not by a public blockchain. In theory, this "immutable" ledger could be modified by an Amazon insider or a hacker.
- ProvenDB relies on public blockchains to guarantee immutability. ProvenDB writes digital signatures to public blockchains such as Ethereum or Hedera that attest to the validity and origin of the data. These blockchains cannot be modified by any known practical mechanism.

It's almost universally recognized that public blockchains offer the highest possible level of data integrity. Public blockchains secure two Trillion dollars of cryptocurrency value which represents the largest "honey pot" for hackers ever created. That these blockchains have never been hacked is a compelling demonstration of their integrity.

QLDB offers strong cryptographic integrity, backed by one of the largest and most competent technology companies. QLDBs' internal integrity is undoubtedly good enough for many applications. We would simply argue that it does not offer the ultimate trust provided by a system backed by public blockchains.

## Feature comparison

Feature	ProvenDB	QLDB
Trust basis	Public Blockchains (Hedera, Ethereum, Bitcoin, Elastos)  Private blockchains (Hyperledger, Ethereum based) are also supported when running on-premise	Immutable journal maintained by Amazon
API	MongoDB compatible API (including SQL query via MongoDB BI Connector) Compatible with all MongoDB drivers and MongoDB-compatible frameworks	PartiQL – SQL based language  QLDB drivers for Java, .NET, Go, Node.js, Python
Storage Model	JSON documents	Tabular with document support
Hosting	Cloud service (Azure by default) or Self-hosed via Kubernetes	AWS
Change history	Yes	Yes
Storage Cost <sup>1</sup>	\$0.02 per GB/month	\$0.25 per GB-month <sup>2</sup>
Redaction (right to be forgotten)	Yes	No
Throughput	5000 documents/second <sup>3</sup>	2 – 3X as many transactions than ledgers in common blockchain frameworks <sup>4</sup>
Encryption at rest and in transit	Yes	Yes

<sup>1</sup> Both QLDB and ProvenDB have additional charges based on IO and (for ProvenDB) blockchain transaction rates. However, the storage component is the most significant component for most users.

<sup>2</sup> For “indexed Storage”. Journal storage is \$0.03 per GB month.

<sup>3</sup> Dependent on document size and batch size of insert. Higher rates for “unmanaged” collections

<sup>4</sup> <https://aws.amazon.com/qldb/faqs/>



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