

Couchbase 4.0

Develop With Agility, Operate at Any Scale

Key Concepts

- Combines the best of relational and the best NoSQL
- Extends SQL to create a query language for JSON documents
- Enables a more efficient way to scale
- Solves the problem of performing queries at scale

N1QL = JSON + SQL

N1QL is the first query language to combine the complete flexibility of JSON with the full power of SQL

Multi-Dimensional Scaling

Scale endlessly as you isolate and optimize query, index, and data services

Global Secondary Indexes

Improved query consistency and reliability for distributed databases

Enhanced Security

Simplified compliance with security standards, LDAP integration, and auditing capabilities

ForestDB Storage Engine

A scalable and high-performance storage engine optimized to take advantage of emerging SSD storage technology

Couchbase 4.0 is a major step forward for NoSQL — embracing the best of relational and SQL, along with the flexibility and scalability of NoSQL, to power web, mobile, and IoT applications for the Digital Economy.

The Digital Economy Drives Technology Change

The business world is undergoing massive change as industry after industry shifts to the Digital Economy. It's an economy powered by the Internet and other 21st-century technologies — the cloud, mobile, social media, big data. At the heart of every Digital Economy business are its web, mobile, and Internet of Things (IoT) applications: they're the primary way companies interact with customers today, and how companies run more and more of their business. The experiences that companies deliver via those apps largely determine how satisfied — and how loyal — their customers will be.

Building and running these web, mobile, and IoT applications is creating a rapidly changing new set of technology requirements. The enterprise architecture has to become far more agile than ever before, and requires an approach to real-time data management that accommodates unprecedented levels of scale, speed, and data flexibility.

NoSQL NoLIMITS

Couchbase 4.0 is the first and only NoSQL database that allows companies to both develop with agility and deploy high-performance applications at any scale. Couchbase has long been known for its high performance and ability to scale. Now, with Couchbase 4.0, we've introduced a powerful new SQL-based query language, N1QL, which enables developers to build applications with unprecedented agility.

Specifically, N1QL lets developers interact with data regardless of how it's modeled. This enables developers to build applications faster, and to easily evolve those applications by extending the data model and adding queries on demand. As a result, companies can build and deploy flexible applications that scale linearly and deliver high performance at any scale — whether running on three nodes or three hundred.

Key Innovations

N1QL gives you the ability to query JSON documents with a declarative query language based on SQL. You can sort, filter, combine, and transform data with a simple query. However, N1QL includes extensions for JSON so you can query and process nested data and arrays, too.

Multi-Dimensional Scaling (MDS) gives you to the ability to manage core database functions — query, index, and read/write — as individual services. You can enable different services on different nodes to optimize the hardware for each service — e.g., run the query service on nodes with faster processors — and to scale a single service, add more query or index capacity without adding more read/write capacity.

Global Secondary Indexing (GSI) gives you the ability to manage indexes on dedicated nodes. You can store the index on as few as one node while storing the data on many nodes. This enables queries to scan a complete index with as few as one request instead of performing multiple requests to scan the local indexes on every single node — an efficient solution to the problem of querying at scale.

Key Concepts

Cross-Data Center Replication (XDCR) Filtering

An easy yet powerful way to replicate data from one cluster to another for increased high availability, disaster recovery, and geographic load balancing

Geospatial Views

Develop rich applications that query and visualize data easily and efficiently in multiple dimensions, including but not limited to spatial views

SQL and Big Data Ecosystem Support

Integrate your data with your enterprise SQL and big data ecosystems, allowing your users to extract insights from data using the tools and applications they're familiar with

SDK Support

Improve developer productivity by allowing developers to query and manipulate data with their favorite language and framework

Full-Text Search

Integrated full-text search with simplified administration enables developers to easily add full-text search capabilities to any application

Bloom Filters

Significantly improve latency for accessing data in which the cached working set is much smaller than the data on disk

DEVELOP WITH AGILITY

Easier, Faster Development

Couchbase 4.0 enables you to build applications faster, easier, and with greater agility by leveraging the flexibility of JSON and the power of SQL.

- Speed development by writing SQL-based queries instead of complex application code
- Add features easily by creating new queries and indexes instead of modifying the data
- Use the language and frameworks you already know — no need to learn a new query language
- Respond to changes better by extending or modifying a flexible data model that evolves over time

Flexible Data Modeling

Couchbase 4.0 enables you to build and evolve applications faster: since the data model isn't defined or enforced by a fixed schema, you can extend and modify the data on demand.

- Keep your data models simple by nesting multi-valued data instead of creating multiple references
- Avoid duplicating data or writing complex query code by modeling for JOINS, not around them
- Extend or modify the data on demand instead of requesting a “schema change”
- Create new indexes and reuse the same data instead of duplicating it

Powerful Querying

Couchbase 4.0 enables you to interact with data easily and in advanced ways by writing concise but powerful queries with N1QL — a declarative query language that extends SQL.

- Write advanced queries with N1QL just like you did with relational databases
- Simplify data access by using a single query to sort, filter, aggregate, and transform data
- Avoid writing complex code to manipulate data and rely on a full-featured query language instead
- Perform JOINS to fetch related data instead of duplicating it or writing code
- Reuse data by creating new indexes to support new queries on the same data instead of duplicating it

SQL Integration and Migration

Couchbase 4.0 enables you to migrate relational data and integrate with SQL-based enterprise tools using standard SQL features and drivers.

- Leverage existing business intelligence and reporting tools with standard, certified drivers
- Migrate relational data easier and faster — no need to denormalize it first since JOINS are supported
- Refactor relational applications easier and faster by converting SQL queries to N1QL queries

Big Data Integration

Couchbase 4.0 enables you to integrate with big data platforms and technologies to perform both offline and real-time analysis of operational data.

- Analyze data faster with complete, fully optimized Spark integration
- Perform real-time analysis by continuously streaming data to Spark or Storm
- Provide interactive access to the results of Hadoop, Spark, or Storm analysis
- Distribute data to multiple systems by continuously streaming it to Kafka queues
- Export data to Hadoop via Cloudera- and Hortonworks-certified integration

Mobile/IoT Extensions

Couchbase 4.0 enables you to create mobile apps that provide a better user experience both offline and online by accessing a local, embedded database that can automatically synchronize changes with your cloud database.

- Create apps that work offline by reading and writing to an embedded database — no network required
- Simplify app development and improve performance with local reads and writes
- Write less code by leveraging automatic, built-in synchronization with remote databases
- Synchronize data across different devices with cross-platform support — iOS, Android, Windows
- Reduce network bandwidth and cost by filtering the data and only synchronizing changes

OPERATE AT ANY SCALE

Elastic Scalability

Couchbase 4.0 enables enterprises to scale easily, efficiently, and reliably, from a few nodes to hundreds, with “push button” simplicity.

- Scale easily with a single node type, topology-aware clients, and automatic partitioning and rebalancing
- Scale reliably with a shared-nothing architecture and no single point of failure
- Scale without slowing down queries by separating querying and indexing from data storage with MDS
- Scale efficiently by leveraging MDS to allocate resources to different database services
- Scale precisely by leveraging MDS to scale a specific service instead of the whole database

Consistent High Performance

Couchbase 4.0 enables enterprises to meet the highest performance requirements with a memory-centric, asynchronous architecture that can support millions of concurrent users.

- Improve performance by leveraging the integrated cache to read some or all data from memory
- Perform durable writes and maintain performance with synchronous, memory-to-memory replication
- Perform low-latency writes by leveraging asynchronous replication, persistence, and indexing
- Maintain consistent performance at scale by leveraging MDS to eliminate resource contention
- Query with high performance at scale by leveraging GSI to query nodes with relevant data only

Always-On Availability

Couchbase 4.0 enables enterprises to avoid downtime, maintain high availability, and recover from disaster via multiple DR options.

- Provide high availability by enabling automatic failover and streaming, and memory-to-memory replication
- Provide high availability by replicating data to multiple racks, data centers, or cloud regions
- Avoid downtime by performing all operations online — including backups, upgrades, and rebalances
- Recover faster by restoring data from full or incremental backups, or from remote data centers

Multi-Data Center Deployment

Couchbase 4.0 enables enterprises to leverage infrastructure across geographies to improve performance by placing data closer to users, and to increase availability by placing data in multiple locations.

- Distribute data by configuring a local data center to replicate to all remote data centers
- Aggregate data by configuring all remote data centers to replicate to a local data center
- Improve performance with local data access by configuring all data centers to replicate to each other
- Reduce the cost of network usage by configuring filters to limit what data is replicated where
- Leverage hybrid cloud infrastructure by replicating data to private data centers and public clouds

Simple and Powerful Administration

Couchbase 4.0 enables enterprises to efficiently deploy, manage, and monitor clusters of any size.

- Reduce admin overhead with “push button” operations that simplify and automate complex tasks
- Simplify management and monitoring by leveraging a full-featured, integrated admin UI
- Save time by automating administrative tasks via CLI and REST APIs
- Accurately monitor and diagnose clusters by leveraging 200+ prebuilt metrics
- Perform live upgrades without any downtime

Enterprise-Grade Security

Couchbase 4.0 enables enterprises to control and monitor administrative access, and to secure communication between applications, administrators, and the database.

- Secure application and administrative access by encrypting network communication with SSL
- Centralize identity management of multiple administrators with LDAP
- Maintain an audit record of who does what, when, and how

About Couchbase

Couchbase delivers the world's highest performing NoSQL distributed database platform. Developers around the world use the Couchbase platform to build enterprise web, mobile, and IoT applications that support massive data volumes in real time. The Couchbase platform includes Couchbase Server, Couchbase Lite - the first mobile NoSQL database, and Couchbase Sync Gateway. Couchbase is designed for global deployments, with configurable cross data center replication to increase data locality and availability. All Couchbase products are open source projects. Couchbase customers include industry leaders like AOL, AT&T, Bally's, Beats Music, BSkyB, Cisco, Comcast, Concur, Disney, eBay, KDDI, Nordstorm, Neiman Marcus, Orbitz, PayPal, Rakuten / Viber, Tencent, Verizon, Wells Fargo, Willis Group, as well as hundreds of other household names. Couchbase investors include Accel Partners, Adams Street Partners, Ignition Partners, Mayfield Fund, North Bridge Venture Partners, and West Summit.



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