



Couchbase
CAPELLA

The Database for AI-powered Applications

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Oct 2025

Agenda

Who we are?

Use cases

Couchbase Architecture

Couchbase – A Day in the Life – 7.4B profiles



Loving the Love Boat

Streaming Yellowstone

Checking Leaderboard

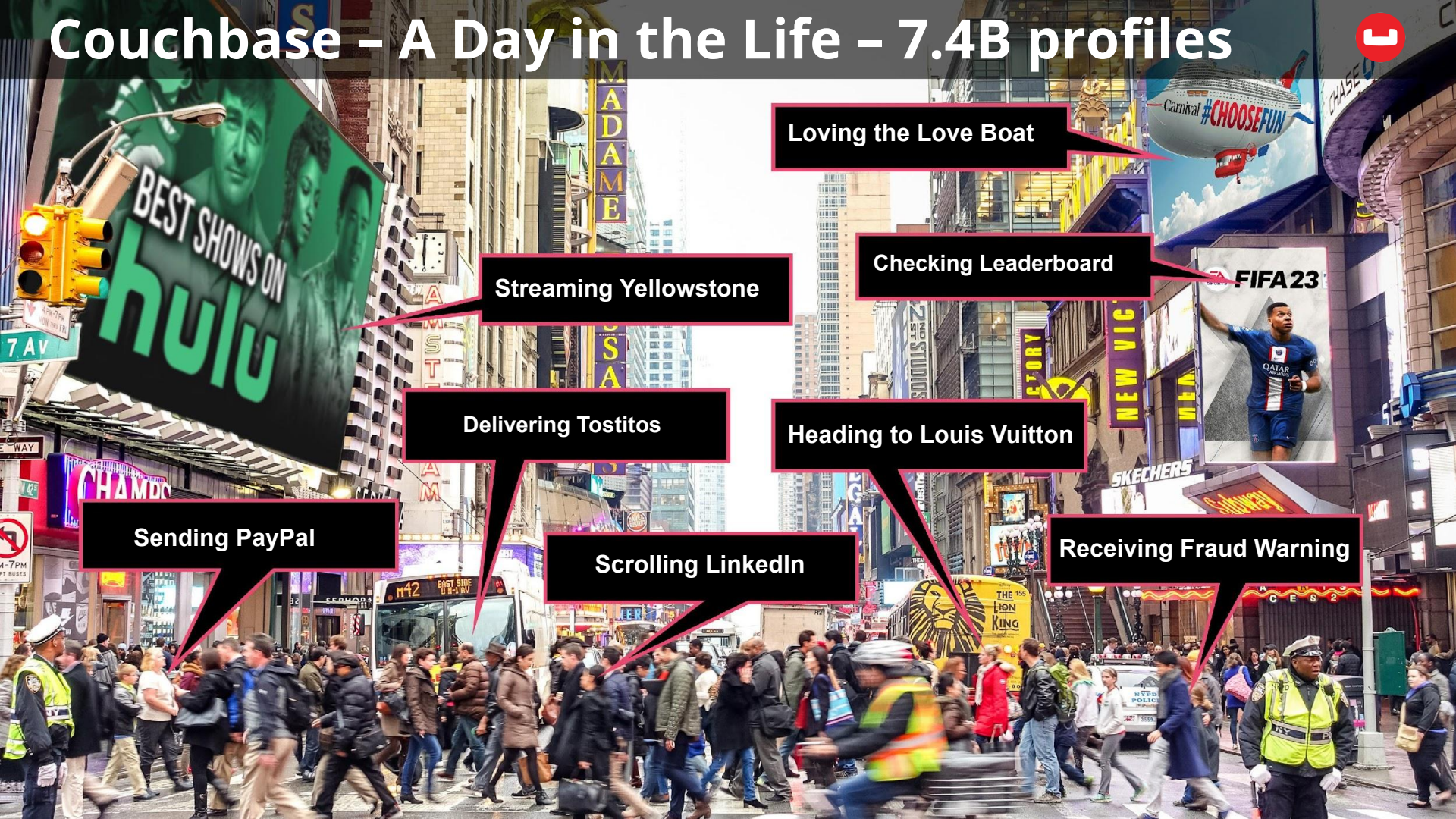
Delivering Tostitos

Heading to Louis Vuitton

Sending PayPal

Scrolling LinkedIn

Receiving Fraud Warning



Couchbase: where does the name come from?

A native JSON + Key-Value + Cache platform since 2011.

February, 2011

CouchOne + Membase = Couchbase

Document
Database
(JSON)



Key-value
Database +
Memory-first

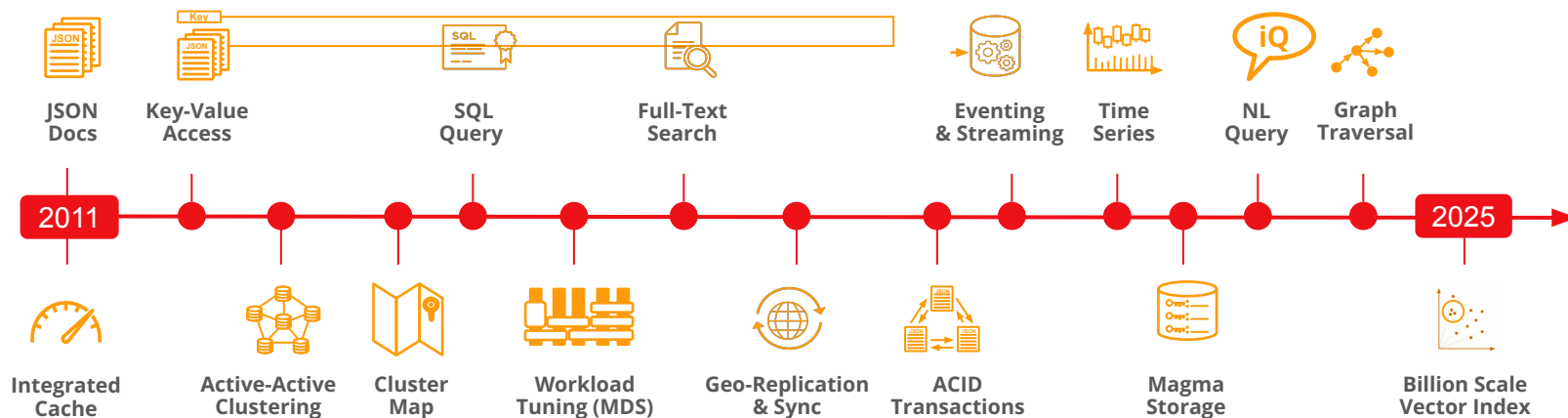


Modern
NoSQL*
Database
**NotOnlySQL*



Couchbase Server Innovation Over Time

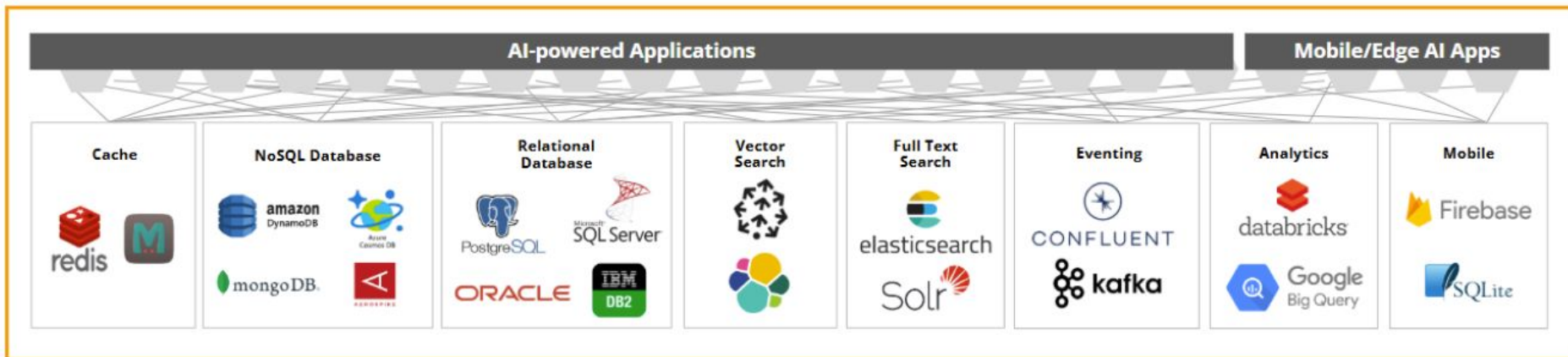
Data Access Services



Performance Foundation

Couchbase: we are more than a NoSQL Database

Our extensive portfolio with cache, vector, full text search, eventing, Analytics and Mobile.



Couchbase: a solid company with many customers.

+1000 customers around the world.



Started
2011



1,000 Employees
CA (HQ), N. America,
EMEA & Asia



NASDAQ
BASE



Fortune 100 &
startups too



AWS, GCP, Azure,
Infosys, Red Hat

Proven Enterprise Solution Chosen by Industry Leaders

Retail & E-Commerce	Travel & Hospitality	Financial Services	Technology & Business Services	Telecom	Media & Entertainment	Gaming	Manufacturing & Utilities
      	     	     	    	     	     	     	     

How is Couchbase Used?



Legacy Modernization (RDBMS to NoSQL)



Real-Time Analytics and Data Insights



Distributed Caching & Session Management



AI/ML & Intelligent Search (RAG, Vector Search)



Sync Data Across Mobile / Edge devices



Event-Driven Systems, Automated Triggers



Geo-Distributed Applications for Global Users



Disaster recovery for high availability

Key Capabilities



Document Store



Real-time Analytics



Integrated Cache



Vector Search



Mobile Database



Eventing



Active-Active Clustering



Auto Failover



SQL query with AI assist



Columnar Storage



Key-Value Access



Feature Store



Sync Gateway



Document Store



Geo-Replication & Sync



Active-DR Clustering



ACID Transactions



SQL query



Key Range Search



In-memory speed



Geo-Replication & Sync



SQL query & UDF



Document Store



Document Store

Others



CONFLUENT



Couchbase is the Data Platform for Enterprises 2/2

We work and provide value to our customers across a variety of industries and use cases.



Retail & E-Commerce

Shopping Cart
Product Catalog
Personalization
Mobile Wallet
Loyalty Program
Product Reviews
Click & Collect



Travel & Hospitality

Shopping Cart
Inventory/Price
Recommendation
Fleet Tracking
Crew Services
Reservation
PNR
Mobile Wallet



Financial Services

Market Data 360
Portfolio Mgmt
Trade Analytics
Fraud Detection
Scoring
Risk Analysis
Insurance Portal
App Processing



Technology & Business Services

Live Chat
Site Monitoring
Platform
Real-time
Reporting
Ad Targeting



Telecom and ISPs

Content
Entitlement
Rate Limiting
Location Manager
Program Status
Media Catalog
Billing Center
Identity Platform



Media & Entertainment

Messenger App
Beaconing
Social/Casual
Gaming
Media Catalog
Personalization
Real-time Viewer
Tracking



Gaming & eGaming

Messenger App
Beaconing
Social/Casual
Gaming
Content Catalog
Personalization
Real-time Game
Tracking



Manufacturing & Utilities

Inventory
Management
Device
Management
Asset Tracking and
Servicing



Amadeus

- Returned value: **< 12 months**
- Lowered TCO: **50-74%**
- Faster dev. cycles: **75-100%**



Trendyol

- Lowered TCO: **75-100%**
- Increased operations: **75-100%**
- Faster response times: **25-49%**

Industry & Innovation Leaders



Global AI-powered fraud detection and prevention

3B+

payment accounts protected

65%

of world's card accounts



Personalize city-at-sea experiences via IoT & edge

15k

mobile sensors per voyage

100Ms

operations per day



High performance caching for social network

10M+

requests per second

900M+

global users



Product catalog, pricing, shopping cart, daily deals, inventory management

4,000

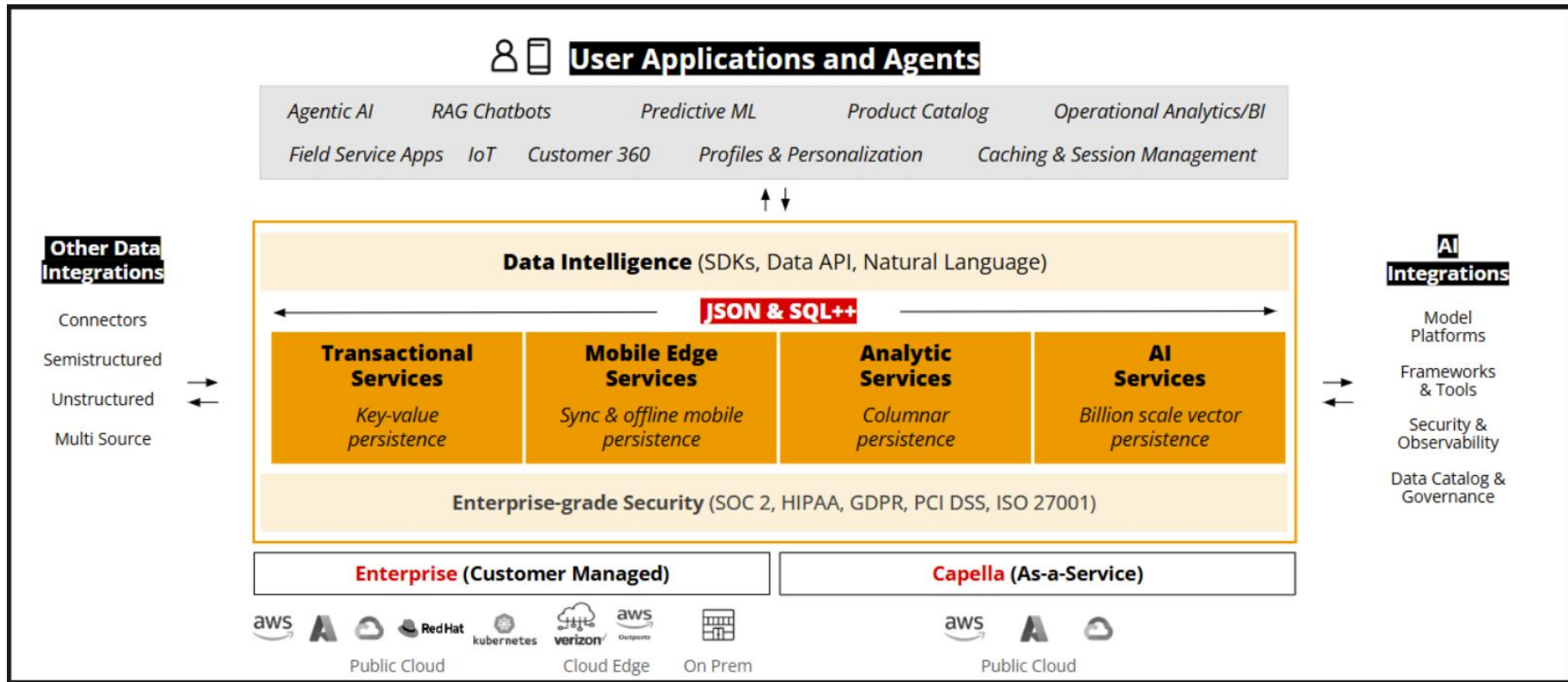
stores worldwide

1.6B

rules applied in real-time

Couchbase: our Developer Data Platform

Data + Database platform with 4 engines: transactional + mobile + analytics + ai.



Couchbase: our value to Architects

- Memory-first speed drives down latency
- Users don't wait
- Read-committed isolation is the same as Oracle's
- Use as necessary
- Real-time analytics
- Large aggregations
- Real-time ingestion
- Real-time writeback
- Optimal resource utilization
- Data, Index & Query workload isolation

Performance Foundation



- Highly-efficient storage management and compression
- Ingenious design to inform applications where data resides
- Facilitates auto-scaling of nodes and data
- Global deployments
- Any node can write and read data
- New read-replica
- Global XDCR
- Sync gateway mobile

Couchbase: our value to **Developers** 1/2

Data Access Services



- Account profiles
- catalogs
- metadata
- prompts
- AI conversations

- Familiar language
- UDFs
- JOINS
- transactions

- Real-time ingestion
- Large-scale aggregation
- Write-back to KV store
- BI integration

- Anomaly detection
- Sensor data

- Roaming user experience
- Real-time location context

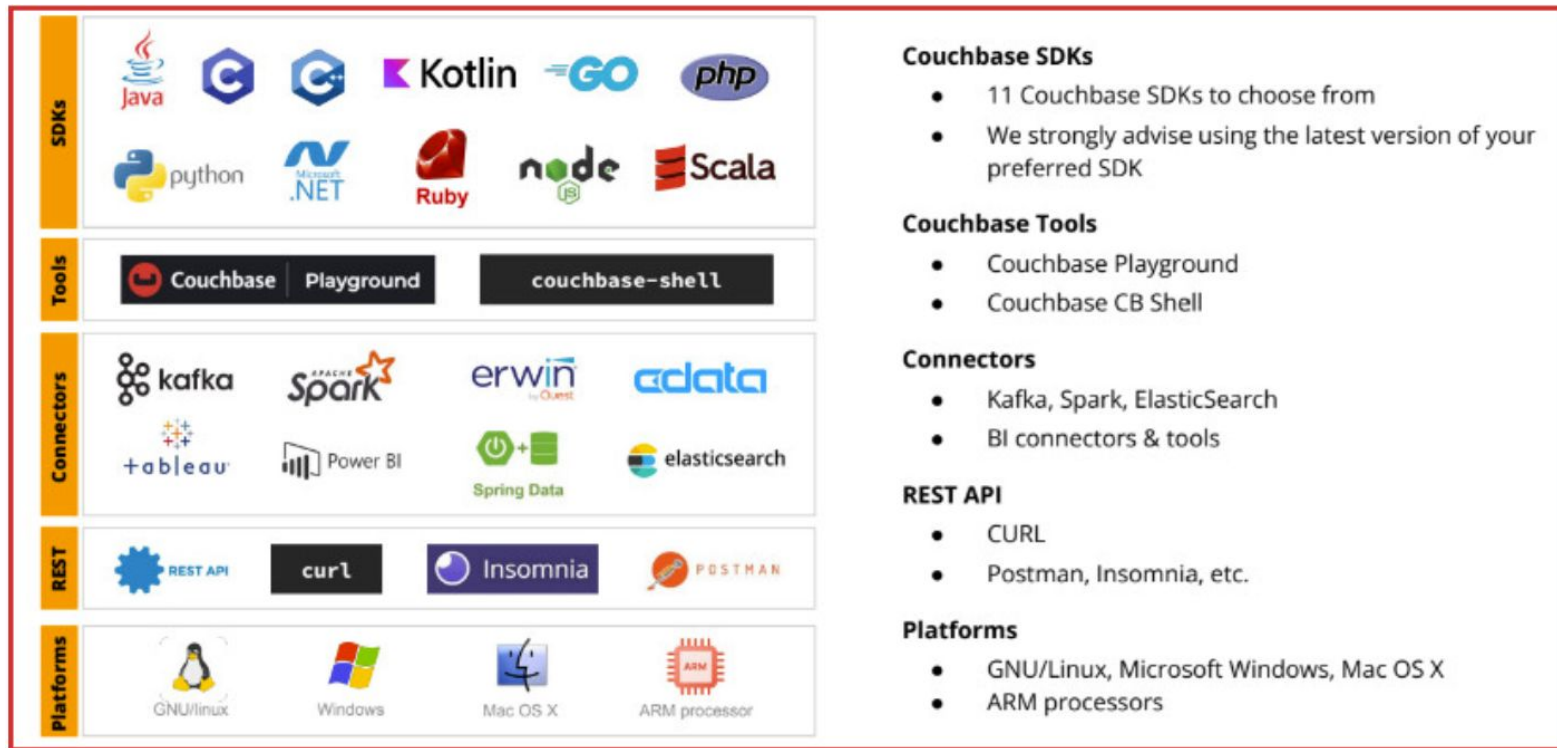
- High-speed, direct programmatic access

- Unstructured search
- geographic-search
- persistent vector coordinates

- Recursive query
- Relationship traversal

- Change capture
- Event trapping

Couchbase: our value to Developers 2/2



Why Couchbase?

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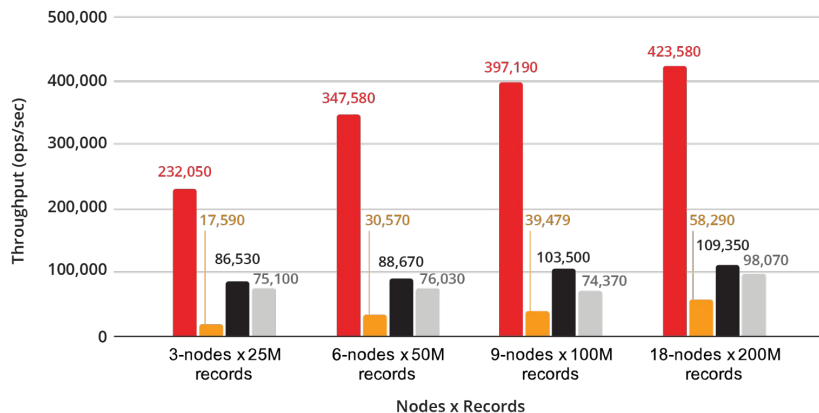
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Our Architecture Put to the Test

Couchbase outperforms competitors by nearly 400% and costs up to 90% less to operate

Operations per Second



Couchbase Capella



MongoDB Atlas

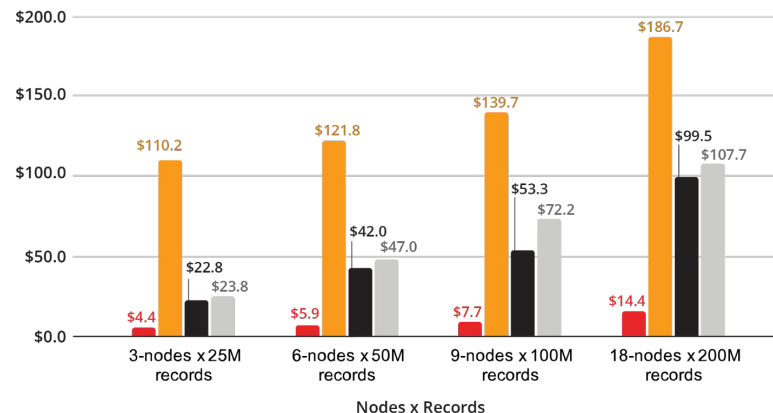


Amazon DynamoDB



Redis Enterprise Cloud

Cost per Billion Operations



Couchbase Capella



MongoDB Atlas



Amazon DynamoDB



Redis Enterprise Cloud

Performance | BenchAnt Ranking

RANK	DATABASE	CLOUD	THROUGHPUT [ops/s] ▼	READ LATENCY [ms]	WRITE LATENCY [ms]
1	Couchbase Server EE v7.6.1 Commercial vanilla large	MS Azure large	224,358	6.6	6.7

Couchbase ranks #1 (and 6 of the top 10)

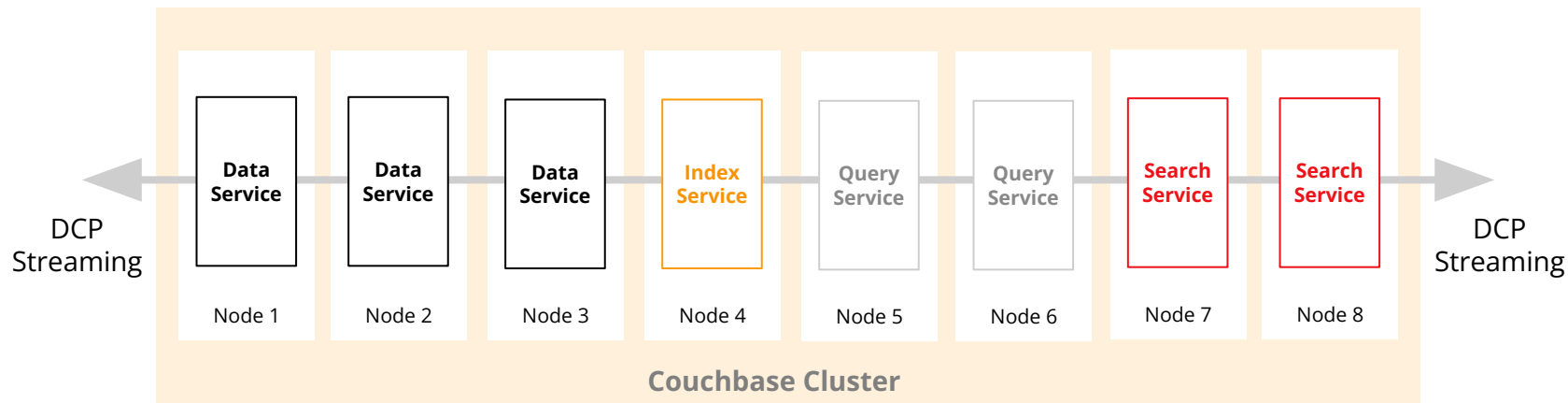
Other vendors: *Cassandra, CockroachDB, CrateDB, MongoDB, MySQL, PostgreSQL, Redis, ScyllaDB.*

<https://benchant.com/ranking/database-ranking>

RANK	DATABASE	CLOUD	THROUGHPUT [ops/s] ▼	READ LATENCY [ms]	WRITE LATENCY [ms]	MONTHLY COSTS [€]	THROUGHPUT PER COST [ops/€]
1	Couchbase Server EE v7.6.1 Commercial vanilla large	MS Azure large	224,358	6.6	6.7	2,885	78.30
2	ScyllaDB v4.5.1 OpenSource vanilla large	AWS large	204,405	4.9	5.4	3,129	65.30
3	Cassandra Apache v4.0.0 OpenSource vanilla large	Alibaba Cloud large	196,364	6.3	6.0	2,539	77.30
4	Couchbase Server EE v7.6.1 Commercial vanilla large	AWS large	186,538	7.1	7.1	3,129	59.60
5	Cassandra Apache v4.0.0 Community vanilla large	IONOS Cloud large	166,018	4.2	4.0	2,296	72.30
6	Couchbase Server CE v7.0.0 Community vanilla medium	Alibaba Cloud large	153,519	1.8	1.8	846	181.40
7	Cassandra Apache v4.0.0 OpenSource vanilla large	AWS large	139,171	10.8	10.6	3,129	44.50
8	Couchbase Server CE v7.0.0 Community vanilla medium	Alibaba Cloud large	117,103	8.8	8.8	2,539	46.10
9	Couchbase Server CE v7.0.0 Community vanilla medium	Alibaba Cloud medium	106,793	3.1	2.1	446	239.80
10	Couchbase Server CE v7.6.1 Community vanilla medium	AWS large	105,716	4.4	4.4	1,043	101.40

Memory-first Architecture

Data movement free from disk bottlenecks

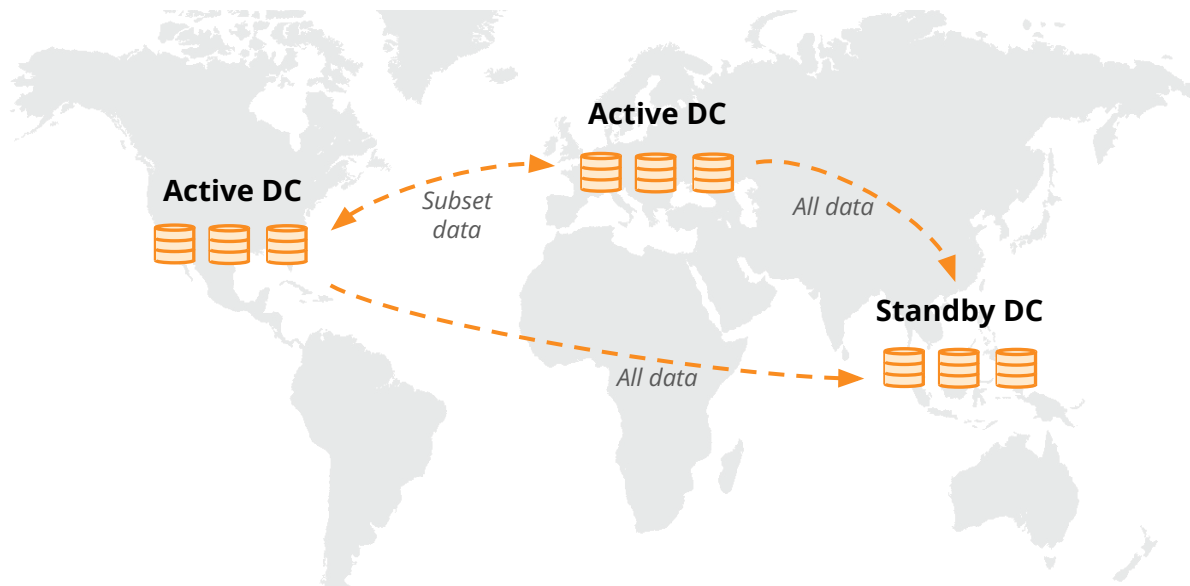


In-memory streaming of updates to all components

Replication Everywhere

Put data and processing where it needs to be around the globe

Cross Data Center Replication (XDCR)



Leveraging the Power of SQL

Familiarity of SQL, leveraging skill sets: *Developers, Architects, DBAs, Analysts, IT*

- Known query syntax
- Supporting
 - ANSI standards
 - JOINS
 - Sub-queries
 - Nested objects
 - Arrays

Relational SQL

```
SELECT ac.industry,  
SUM(CASE WHEN a.activitytype = 'Task'  
THEN 1 ELSE 0 END ) task,  
SUM(CASE WHEN a.activitytype  
='Appointment'  
THEN 1 ELSE 0 END ) appts  
FROM crm.activity a  
INNER JOIN crm.account ac  
ON (a.accid = ac.id)  
WHERE a.startdate BETWEEN '2024-10-01'  
AND '2024-12-31'  
GROUP BY ac.industry
```

Couchbase - SQL++

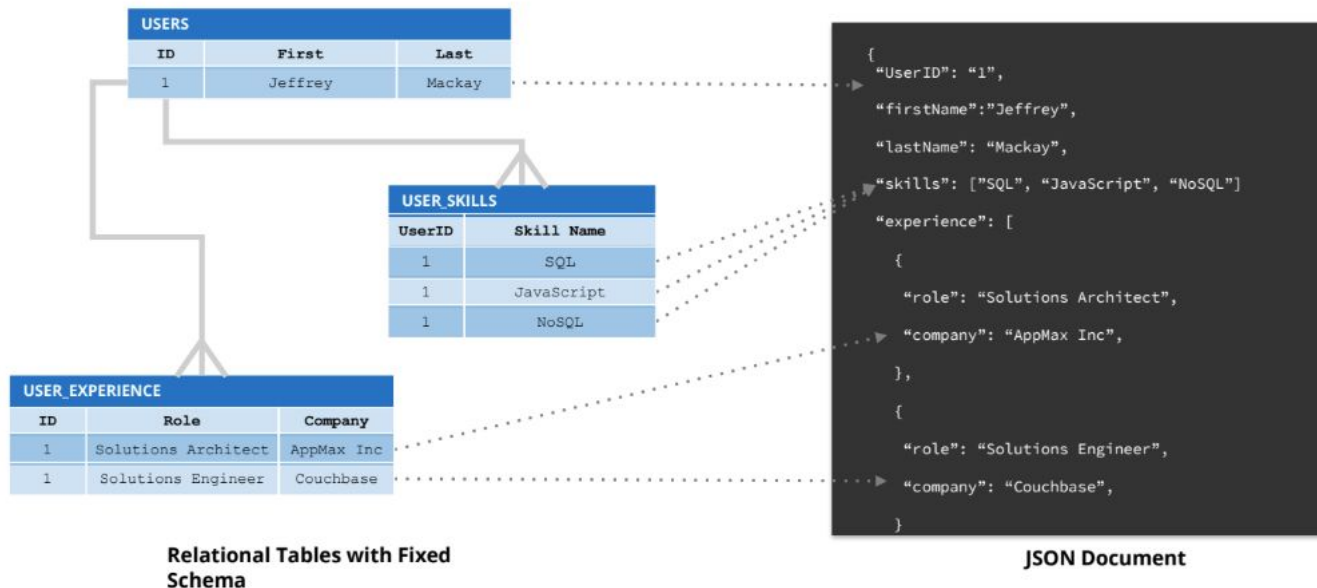
```
SELECT ac.industry,  
SUM(CASE WHEN a.activityType = 'Task'  
THEN 1 ELSE 0 END) task,  
SUM(CASE WHEN a.activityType =  
'Appointment'  
THEN 1 ELSE 0 END ) appts  
FROM crm a  
INNER JOIN crm ac ON a.accid = ac.id  
AND ac.type='account'  
WHERE a.type='activity'  
AND a.startDate BETWEEN '2024-10-01'  
AND '2024-12-31'  
GROUP BY ac.industry
```

MongoDB Query Language

```
db.activity.aggregate(  
  { $match: { startDate: { $gt: '2024-01-01',  
    $lt: '2024-12-31' } } },  
  { $lookup: {  
    from: "account",  
    localField: "accid",  
    foreignField: "id",  
    as: "account_docs"  
  } },  
  { $match: { "account_docs": { $ne: [] } } },  
  { $unwind: "$account_docs",  
    {  
      $project: {  
        item: 1,  
        task: { $cond: { if:  
          { $eq: ["$activityType", "Task"] }, then: 1,  
          else: 0 },  
        appt: { $cond: { if:  
          { $eq: ["$activityType", "Appointment"] },  
          then: 1,  
          else: 0 } } }  
      },  
      {  
        $group: {  
          _id: "$account_docs.industry",  
          tasks: { $sum: "$task" },  
          appointments: { $sum: "$appt" }  
        } }  
    }  
  );
```

JSON: the Developer in control of the data

JSON makes changing dynamic user profiles and complex catalog entries very easy



- **Store data in logical ways:**
 - Denormalized single document
 - Normalized with references
 - Add new values when needed
 - Support for binary values
 - As relational schema using Scopes & Collections
- **Access Data in multiple ways:**
 - Direct Key-Value
 - SQL++ querying
 - Full-Text Search
 - Time Series
 - MPP analytics
 - As Events

Unlike document databases, RDBMSs store JSON as a column datatype, therefore it is still attached and bound to the schema, and updating JSON values is... "a PITA," and limited to the JSON extensions added to the vendor's query language.

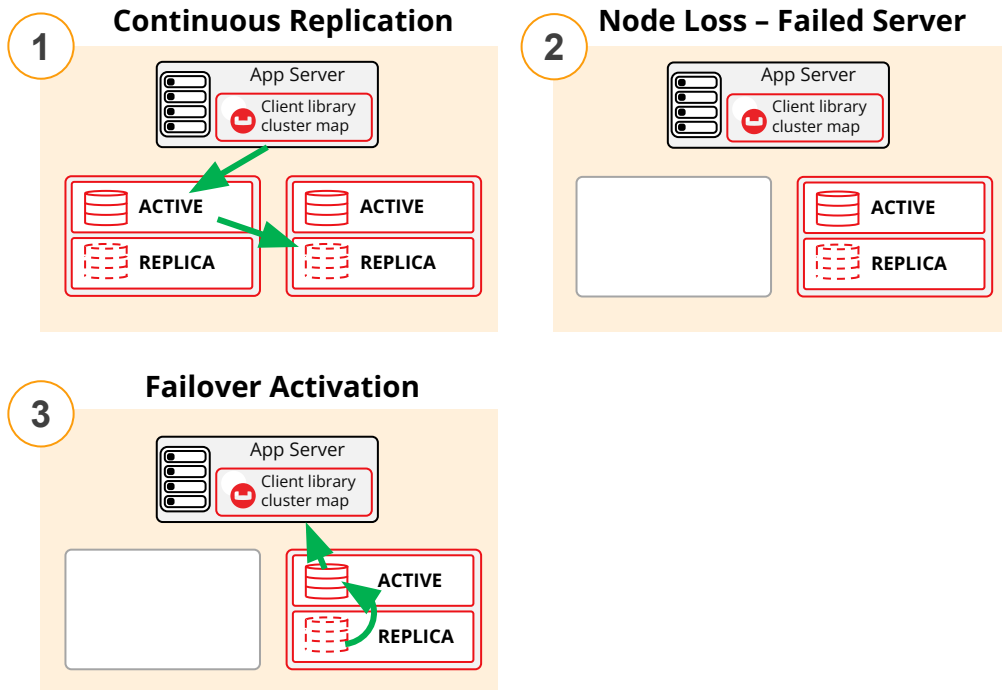
Unlike relational databases, the application developer controls the structure of the data, rather than the DBA who owns the relational schema, thereby dictating the application's structure.

Active-Active Availability and Reliability

Always on to deliver the responsiveness needed

Supported by

- Continuous replication
- Auto failover recovery to next available active node
- Upgrade without disruption
- Speedy rebalancing
- Data center replication across clusters
- Auto sharding



Reduce the High Cost of Operations with Couchbase



Replace multiple databases and eliminate more than half their infrastructure to enjoy better performance from a less complex, all-in-one architecture.



Developers code faster and write less complex applications

Benefits

- **Costs:** Save on infrastructure and software costs
- **Time:** Save on administration and Integration labor costs
- **Quality:** Code better features, with less training cost, faster
- **Effectiveness:** Test and deploy efficiently in less time

53%

Customers who had 50% or more TCO reduction*

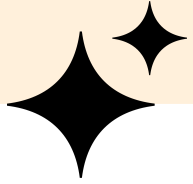
Capella Free Tier



LinkedIn Contact

Selene García





Thank you!



Couchbase

