Couchbase highlights relational database familiarity to drive transformation-led adoption

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NoSQL databases emerged in the past decade to fulfill requirements for flexible application development and data processing. Couchbase is continuing to adopt concepts and functionality normally associated with the relational database model to drive further enterprise adoption of its NoSQL document database.

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Introduction

NoSQL databases emerged in the past decade to fulfill requirements for flexible application development and data processing that were unsuited to the pervading relational database model. The proponents of NoSQL databases were in many cases not as diametrically opposed to existing database approaches as the term 'NoSQL' suggested, however. Couchbase, in particular, has been at the forefront of marrying the flexibility and agility advantages of nonrelational models with the familiar concepts of the relational model, with a view toward driving adoption as enterprises look to update their existing databases amid digital transformation initiatives. Most notably, the company extended the core concepts of the SQL language to work with JSON data and N1QL. More recently, the concepts of tables and schema received the Couchbase treatment with the support for 'collections' and 'scopes' in Couchbase 7.0, the beta of which was launched in late 2020.

THE 451 TAKE

Couchbase is increasingly focused on making it easier for relational database users to adopt its NoSQL database. Initially, this has been done by lowering the learning and development curve for the creation of new applications, but concepts such as scopes and collections could also potentially be used to help map the functionality of existing applications from relational databases to Couchbase. This could stand the vendor in good stead as we see enterprises continue to explore database products and services from firms other than the existing industry heavyweights, while also looking to make use of existing investments in skills and expertise. The fact that Couchbase's portfolio spans the distributed cloud with availability on-premises, at the edge and as a managed cloud service – with a good story to tell in terms of support for cloud-native architecture – will also likely be increasingly attractive to potential customers as they explore their options for data modernization as part of larger transformation initiatives.

Context

Data from 451 Research's Voice of the Enterprise: Digital Pulse, Coronavirus Flash Survey June 2020 illustrated that for many enterprises one of the impacts of the pandemic was to accelerate the adoption of new technologies and approaches in areas such as the shift to digital delivery of customer experience, the automation of business processes, digital transformation, and the migration of workloads to the cloud.

As we recently articulated, emerging trends in application design and delivery associated with such transformational initiatives are also driving the evolution of data-processing and analytics requirements. NoSQL database providers are particularly well-placed to benefit from these trends. NoSQL databases emerged to fulfill requirements for flexible application development and data processing that were unsuited to the established relational database model. While initial adoption of NoSQL was spurred by less mission-critical non-transactional applications, they are increasingly being considered for next-generation enterprise apps thanks to the need for real-time distributed data processing and analytics, as well as the delivery of functionality enhancements by the NoSQL database suppliers.

REPORT REPRINT

Couchbase is no exception. In fact, it could be argued that the company has been at the forefront of lowering the barriers to adoption of NoSQL databases by users more familiar with relational databases approaches – not least through the 2015 delivery of its N1QL query language. It now claims over 500 enterprise customers across its product portfolio. Last year, the vendor announced a $105m series G funding round – led by GPI Capital, with existing investors Accel, Sorenson Capital, North Bridge Venture Partners, Glynn Capital, Adams Street Partners, and Mayfield – that took its total funding to $250m.

Products

Couchbase remains best known for the Couchbase Server document database, designed for deployment on physical and virtual infrastructure, including IaaS cloud platforms. The firm also offers Couchbase Lite and Couchbase Sync Gateway for mobile and edge computing applications, and in 2020 added the Couchbase Cloud managed service.

A key feature of the latter is that it decouples the control and data planes of the combined database. While the data plane resides within a client's own virtual private cloud – giving them control over their data – the control plane is hosted and managed by Couchbase and provides customers with user management, cluster management, monitoring and billing functionality.

The separation of data and control planes enables the company to support multicloud orchestration and cross-datacenter replication across multiple cloud suppliers and regions. Couchbase Cloud was initially available on Amazon Web Services, but availability on Microsoft Azure was added in early 2021, and availability on Google Cloud is also in development.

Two packages of Couchbase Cloud are available. Developer Pro is designed for development/testing and noncritical deployments, and comes with 10/5 service-level responsiveness, while Enterprise is designed for production systems that require 24/7 support. A free self-service 30-day trial, providing a three-node cluster with 200GB of storage, is also available. Additionally, Couchbase Cloud supports replication to on-premises Couchbase Server deployments for live migration and disaster recovery, while Couchbase Lite and Couchbase Sync Gateway also feature support for mobile applications and edge data processing with peer-to-peer sync and replication, giving the vendor a portfolio than spans the distributed cloud.

Technology

While Couchbase Server is a NoSQL JSON document database, the company can point to various features that support advanced functionality more traditionally associated with relational databases. These include multi-document ACID transactions, delivered with version 6.5 in 2019, and SQL-like analytics (courtesy of the N1QL query language).

Couchbase Server 7.0 entered beta testing in late 2020 and is due to be generally available in the summer. It delivers several capabilities designed to be familiar to users of relational databases. These include Collections, which can be thought of as the equivalent to tables in a relational model, and Scopes, which are sets of Collections that can be thought of as equivalent to relational database schema.

In combination, Scopes and Collections enable Couchbase to provide more fine-grained isolation and organization of data, which is particularly relevant to the development of microservice-based multi-tenant applications. Couchbase already supports up to 30 database instances (or 'Buckets') in a single cluster. Each cluster can now be logically subdivided into up to 1,000 Collections (or data containers), as well as 1,000 Scopes (sets of related Collections). Role-based access control, Cross Data Center Replication, and backup and restore can all be applied at the Bucket, Scope or Collection level.

Additionally, the firm offers Couchbase Autonomous Operator to provide support for deployment in Kubernetes environments. Version 2.1 of the Couchbase Autonomous Operator was launched in October 2020 with autoscaling of stateless Couchbase services, usage metering reports, and support for Istio service mesh. At that time, the company also confirmed that 120 of its customers were already using Couchbase Autonomous Operator (initially launched in August 2018) to support the deployment of Couchbase in container architecture environments.

Competition

Couchbase's primary competition comes from other NoSQL database providers – including MongoDB, DataStax, Redis Labs and MarkLogic, as well as NoSQL database cloud services from the likes of AWS, Google, Microsoft Azure, Alibaba Cloud, IBM and Oracle. While the various NoSQL database offerings have carved themselves a portion of the database sector in recent years, the overall market remains dominated by relational database products from industry heavyweights Oracle, IBM, Microsoft and SAP.

In addition to launching their own NoSQL database products and services, the industry giants have also adapted their relational database products to be able to store, process and query JSON documents. While this functionality is not comparable with the level of functionality offered by a native document database, it is indicative of a blurring of the lines between relational and nonrelational databases that also motivates efforts by nonrelational database suppliers to replicate key functionality and concepts available in relational databases to lower the barriers to wider adoption.

SWOT Analysis

STRENGTHS
Couchbase has a mature portfolio of NoSQL database products that spans the distributed cloud with availability on-premises, at the edge and as a managed cloud service.

WEAKNESSES
The company cannot boast the levels of developer-led adoption enjoyed by some of its rivals and has a lower market share and awareness compared with some of its peers.

OPPORTUNITIES
The database space remains dominated by the relational model, providing further opportunities for growth by NoSQL vendors that can lower the barriers to adoption by relational database users.

THREATS
The NoSQL database sector remains crowded with multiple vendors vying for what is currently a small slice of an overall database market dominated by industry heavyweights.