InterSystems
White Paper
For Financial
Services Executives

Deploying an Elastic Data Fabric with Caché

InterSystems

Executive Summary

For twenty years or more, large financial institutions have been locked in a battle between the need for extremely high performance transaction processing and the demands of downstream applications that can deliver competitive advantage if they can get real time access to this transactional data. When individual database servers could no longer handle simultaneous transaction and query workloads, many firms turned to replication, offloading data access onto read-only copies of production databases. While this strategy worked well for smaller volumes, greater data volumes (years of accelerating trading velocity, more data sources) have stretched data replication architectures to the breaking point. Many are exhibiting problems with performance, scalability, manageability, maintainability, and data governance. In short, they have become an unacceptable risk to firms' continued growth and market responsiveness.

InterSystems Caché® offers a different approach, by enabling customers to deploy an Elastic Data Fabric that is massively scalable, runs on commodity architectures, and can be deployed in the cloud. Instead of replication, Caché uses its advanced Enterprise Cache Protocol that transparently delivers in-memory access speeds for massive amounts of data distributed in local- and wide-area configurations. To oversimplify, Caché replaces hordes of database replicas and database servers with a distributed, shared data cache designed for fault tolerance, data integrity, and linear scalability.

Most importantly, Caché includes robust SQL capabilities so that existing SQL-based applications can use the Elastic Data Fabric without disruption. And, because Caché natively delivers other powerful data paradigms – objects, documents, key/value pairs, and so on – the Elastic Data Fabric also transparently enables future transactional and analytic development, even with Big Data, on an enterprise-grade massively scalable foundation.

Introduction

Historically, the transactional databases used by financial services solutions have had to fulfill two functions simultaneously. They need to process large numbers of transactions very quickly, and they need to respond in near-real-time to queries of the data they contain. The need for both extremely high transaction rates and short query response times without processing delays quickly becomes challenging for traditional database products.

One common workaround has been to employ a data replication architecture which divides the transaction processing and query fulfillment functions between different servers. However, as growth fuels enormous increases in data volumes and the number of concurrent queries, data replication fails to provide the performance, scalability, reliability, manageability, and data security that financial institutions require.

This paper presents a modern-day alternative to data replication architectures. InterSystems Caché enables financial institutions to deploy an Elastic Data Fabric that is massively scalable, can run on commodity machines, and can be deployed in the cloud. Instead of hordes of database replicas and database servers, the Elastic Data Fabric provides a distributed, shared data cache designed for fault tolerance, data integrity, and linear scalability.

Best of all, Caché supports complex SQL queries, so financial institutions can leverage their investment in existing applications as they benefit from the performance and scalability of the Elastic Data Fabric.

The rise and fall of data replication

To satisfy escalating transaction processing and data access needs, many large banks began (in the 1990s) to use replication – offloading data access onto read-only copies of production databases. The work of responding to queries was given to multiple separate servers, thereby improving performance and scalability.

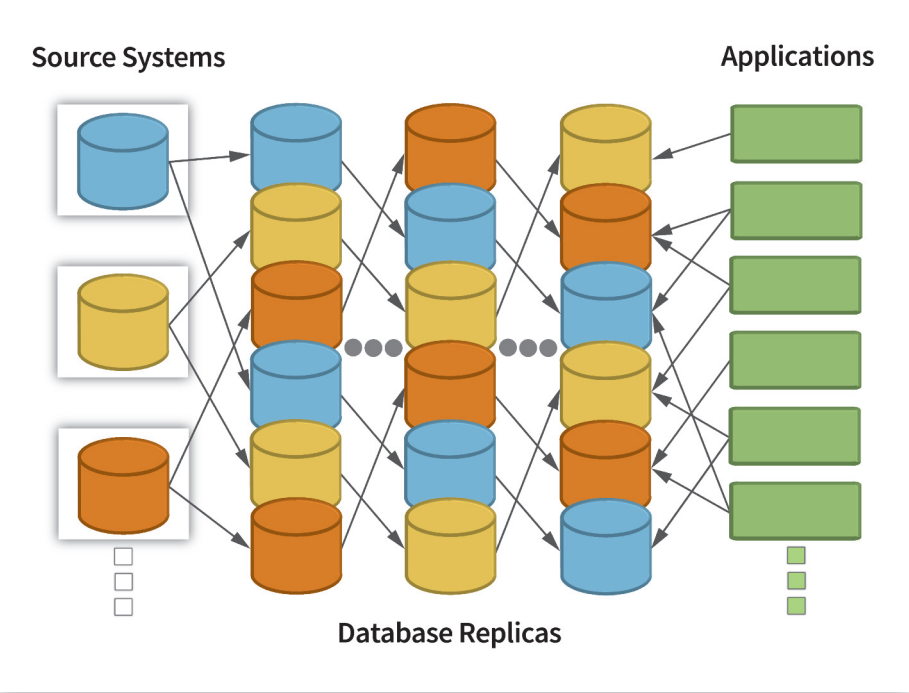

Fig. #1: Replication

Data replication architectures worked well in the beginning, but as institutions experience growth of data volumes, growth of data velocity, and growth of the number of users, "several" replicas soon become "many" replicas. Issues inevitably arise with:

- **Performance and Scalability**
  As data volumes grow, and the number of data sources and concurrent queries increases, query response times may slow to unacceptable levels.

- **Manageability and Maintainability**
  All the replicas must be managed and maintained separately – a daunting task as the number of required replicas increases.

- **Data Governance**
  Without any centralized way of managing all the replicas, data governance and security may become suspect.

Many organizations feel they are hitting the wall when it comes to their existing data replication architecture. They are searching for an enterprise-class solution that can provide excellent performance even when running against very large volumes of data.

InterSystems Caché enables an Elastic Data Fabric

InterSystems Caché enables a different approach. Hordes of database replicas and database servers are replaced with an Elastic Data Fabric – a distributed, shared data cache that is massively scalable and can be deployed in the cloud.

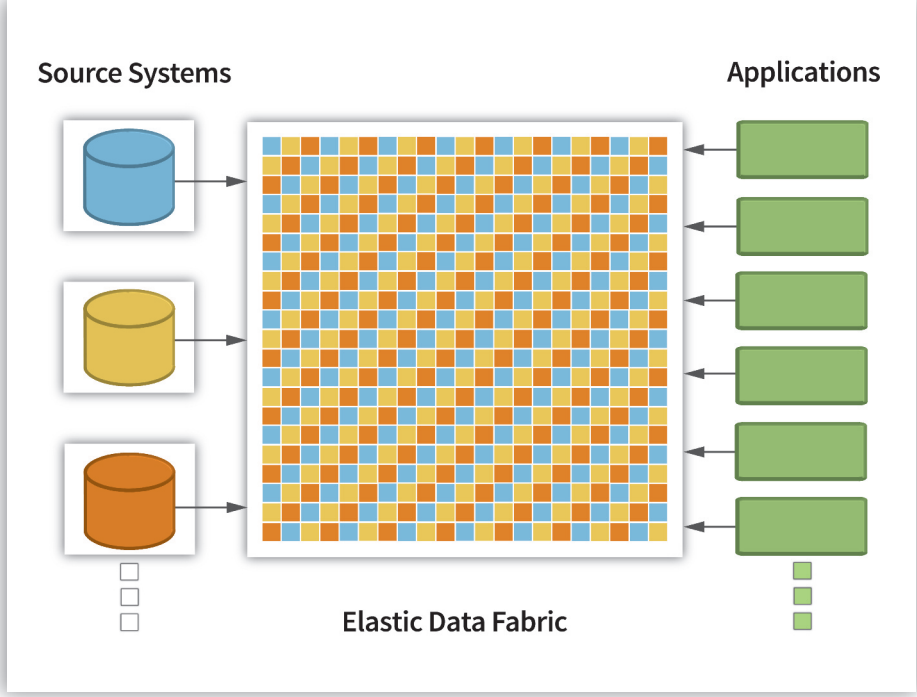

Fig. #2: Elastic Data Fabric

Caché's unique Enterprise Cache Protocol transparently enables the Elastic Data Fabric to behave as if it were a single, local database. Query response times are stable, even with increasing data volumes and numbers of concurrent queries, so the system is extremely scalable. In addition, the Elastic Data Fabric is ideal for deployment in the cloud, with all of the capacity flexibility benefits that result.

Unlike many other Big Data solutions, Caché robustly supports SQL. Financial institutions can continue to use their existing SQL-based applications with few or no changes.

Caché is a proven technology that delivers enterprise-class resiliency, management, and security capabilities. In addition, although Caché provides sophisticated SQL support, it is not constrained to a relational model. If future applications require the use of other data paradigms – objects, documents, key/value pairs, or even unstructured data – Caché can handle it.

Conclusion

Financial institutions that use InterSystems Caché to deploy an Elastic Data Fabric can continue to use their SQL-based applications while avoiding the performance, scalability, and manageability issues that plague data replication architectures.

About InterSystems

InterSystems develops advanced data management, strategic interoperability, and analytics platforms that enable clients and partners to make breakthroughs in healthcare, financial services, government, and dozens of other industries. With a passion for excellence and a focus on client success, InterSystems is a privately held company headquartered in Cambridge, Massachusetts (USA), and its software products are used daily by millions of people in more than 100 countries.

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