

An InterSystems Benchmark Report:

InterSystems IRIS for Hybrid Transactional-Analytical Processing (HTAP)



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 **InterSystems**[®]
Creative data technology

The unique and highly efficient architecture of InterSystems IRIS significantly outperformed several competing database systems in a recent, realistic “apples-to-apples” comparison of hybrid translytical workloads.

Executive Summary and Overview

This report describes a performance benchmark of InterSystems IRIS® in comparison with other data platforms. The test profiles combined simultaneous transactional **ingestion** and analytical **queries** of incoming data, an instance of highly efficient, real-time, concurrent, and hybrid transactional-analytical processing.

The benchmark simulates workloads that have been designed to match typical production-like deployments, updating and superseding similar but older benchmarks. Details of the workload simulations are described in the methodology and hardware sections of this report.

The 2025.2 version of InterSystems IRIS demonstrated performance **significantly superior** to that of the near-competitor databases tested, confirming the strongly positive judgment of data platform analysts such as Gartner and Forrester.

Hybrid Transactional/Analytic Workloads

Historically, **transactional** applications (OLTP, based on real-time data) and **analytical** applications (OLAP, based on historical and other non-real-time data) were implemented on separate architectures and platforms. But as organizations started to make use — in real time — of the insights gleaned from their data, new solutions emerged that embodied *hybrid transactional-analytical processing* (HTAP). Transactional-analytical applications simultaneously support rapid ingestion of data from a variety of sources and sophisticated concurrent analytics. Traditional data platforms struggle to meet such needs. In recent years, however, hybrid platforms have been available and adopted across use cases and industries.

The InterSystems IRIS data platform is designed for development and execution of high-performance HTAP applications. It combines in-memory performance with highly optimized disk storage and uniquely intelligent and distributed data-aware caching that eliminates the need to duplicate entire data sets in memory or on disk. Applications built on InterSystems IRIS can ingest dense streams of transactional data, while simultaneously executing complex analytics.

This benchmark report presents the results of speed tests that compare how InterSystems IRIS executes a set of HTAP workloads with several competitor databases.

Industry Terms from Analyst Firms

Gartner refers to this combined architecture as hybrid transactional-analytical processing, centering on the ability to perform transactions and analytics simultaneously on the same platform.

Forrester uses the terms **translytics** and **translytical**, a portmanteau of transactional and analytical, to describe unified data platforms that eliminate the traditional separation between OLTP and OLAP workloads.

Purpose of the Benchmark

The benchmark demonstrates translytical or hybrid transactional-analytical processing using InterSystems IRIS. It shows how InterSystems IRIS delivers high and balanced performance for simultaneous ingestion and query of data, in real time. This combination is ideal for real-time decision making. InterSystems IRIS accomplishes this by combining in-memory performance with traditional database reliability. It works on a single instance of InterSystems IRIS or on an InterSystems IRIS cluster in the cloud.

The conclusions of this report are based on an objective, “apples-to-apples” comparative analysis of InterSystems IRIS 2025.2 against PostgreSQL 14, MySQL 9.1.0, and SQL Server under demanding HTAP workloads.

HTAP workloads vary across applications and industries. In **finance**, such jobs support trading, fraud detection, and risk analysis. **Industrial** and **IoT** systems use these jobs for sensor monitoring and predictive maintenance, while **e-commerce** and **healthcare** rely on them for rapid updates and timely decisions.

For more about the architecture that makes InterSystems IRIS a uniquely powerful platform, see our [technology brief](#).

Benchmark Test Methodology

The following diagram sketches the AWS-based benchmark architecture at a high level:

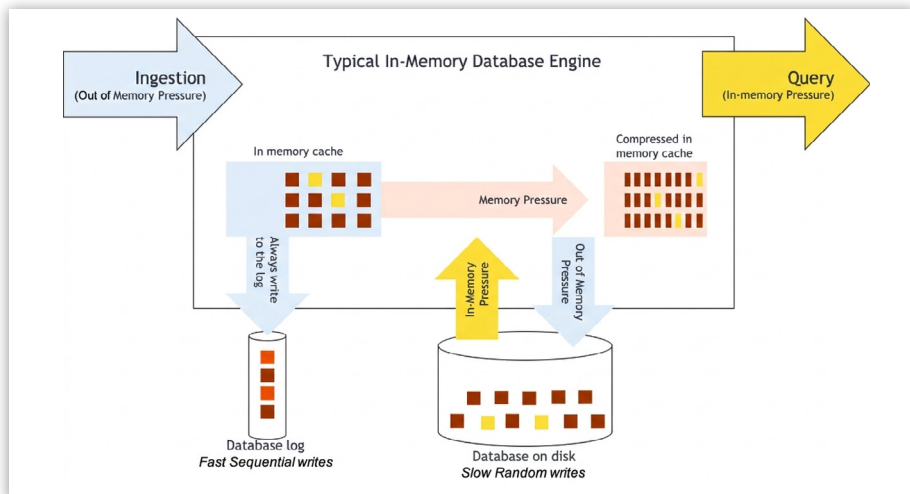


Figure 1: In-Memory Database Architecture for Ingestion and Query on AWS

When data is ingested rapidly, the database first writes each transaction to a sequential log for durability, then stores the updated row state in memory, so that queries can be served quickly without disk access. The memory cache holds the current state of the database, while a background process eventually propagates these changes to slower random-write storage. In-memory databases compress data and postpone writing to disk for as long as possible, flushing data only when forced to. During heavy ingestion, new data arrives faster than it can be written to disk, filling memory faster; while concurrent queries force frequently accessed records to be cached. Thus **mixed workloads escalate simultaneous, conflicting demands** on a database’s memory, logging, and storage systems.

Benchmark Run Procedure

The benchmark test can be run on either AWS, macOS, or Windows.

On AWS EC2:

The test requires an AWS account and key pair on a new EC2 instance via the AWS EC2 Console. Preparing for test requires selection of a server, architecture, and instance type. The storage and network connection must be configured and Docker and Docker Compose installed. Details can be found in the GitHub entry for this benchmark (see below, near end of this paper).

On Windows or macOS:

The test can instead be run on Windows or macOS, with Docker, Docker Compose, and Git. Once the environment is set up, the procedure is essentially the same as with AWS.

Databases Compared:

The databases that were compared in these test runs consist of the following, each with an appropriate set of files and procedure:

- MySQL
- SQL Server
- PostgreSQL

Hardware and Environment

Server Configuration

The benchmark environment was deployed on **Amazon Web Services** (AWS) using EC2 instances to provide a consistent and reproducible setup for all tested databases. Each instance was created using the **Amazon Linux 2 AMI (64-bit, x86)** and configured with a **t2.2xlarge** instance type, providing **8 vCPUs** and **32 GB of memory**. Storage was provisioned with a **16 GiB gp3 root volume**, and networking was configured to allow **SSH (port 22)** access and **HTTP (port 10000)** for the benchmark web interface.

Container Configuration

Docker and **Docker Compose** were installed on each EC2 instance to manage containerized test components. The test harness, ingestion workers, query workers, and web UI were all deployed as containers using Docker Compose files specific to each database system—**InterSystems IRIS**, **PostgreSQL**, **MySQL**, and **SQL Server**.

Once all containers were running, the benchmark could be accessed via the browser using the instance's public IP address (<http://<PublicIP>:10000>). Each test executed under the same hardware, software, and network conditions to ensure an “apples-to-apples” comparison across all platforms.

Benchmark Results

InterSystems IRIS Speed Test Results Overview

This benchmark demonstrates how InterSystems IRIS delivers high in-memory performance and consistent behavior under demanding hybrid workloads. The tests show that the platform runs efficiently on both a single local instance and AWS, with similar results across environments. Using the same HTAP workload, the benchmark compares InterSystems IRIS 2025.2 with PostgreSQL 14, MySQL 9.1.0, and SQL Server 2022 to provide a fair, side-by-side view of their ingestion and query performance. By applying identical ingest and query operations across all systems, the results highlight the ability of InterSystems IRIS to handle **simultaneous transactional and analytical workloads more effectively** than the other tested databases.

Performance Highlights

A 60-second HTAP benchmark using InterSystems IRIS processed 5.4 million inserted records and over 549,000 queried records, amounting to roughly 1.4 GB of data ingested and 143 MB queried, with an average query time of 0.11 ms. The insert-rate results show InterSystems IRIS rapidly reaching more than 100,000 inserts per second and sustaining a stable average throughout the run, with normal short-term fluctuations. Measured in data volume, ingestion similarly stabilized around 30–35 MB/s. Query performance remained steady at roughly 9,000–10,000 queries per second, with the average rate remaining flat for the full duration. These results illustrate the ability of InterSystems IRIS to maintain **high and consistent throughput** for both ingestion and querying under continuous mixed workload conditions.

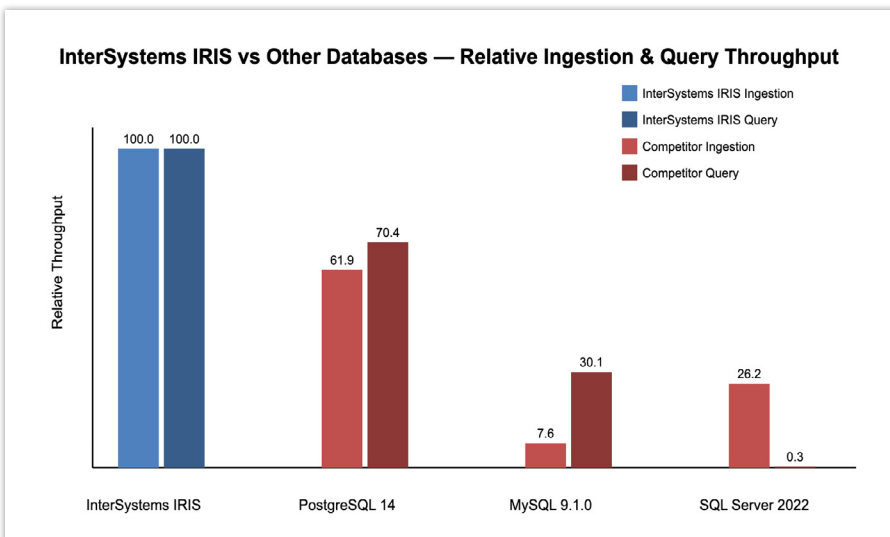


Figure 2: Comparison of Database Relative Throughputs, Ingestion versus Query

InterSystems IRIS Versus Other Databases

The following table summarizes the insert and query rates.

Comparison of InterSystems IRIS with	Insert Performance	Query Performance
PostgreSQL 14	InterSystems IRIS ingests 61.5% more records than PostgreSQL 14	42% faster at querying
MySQL 9.1.0	InterSystems IRIS ingests 1217% more records than MySQL 9.1.0	332% faster at querying
SQL Server 2022	InterSystems IRIS ingests 281% more records than SQL Server 2022	33,750% faster at querying

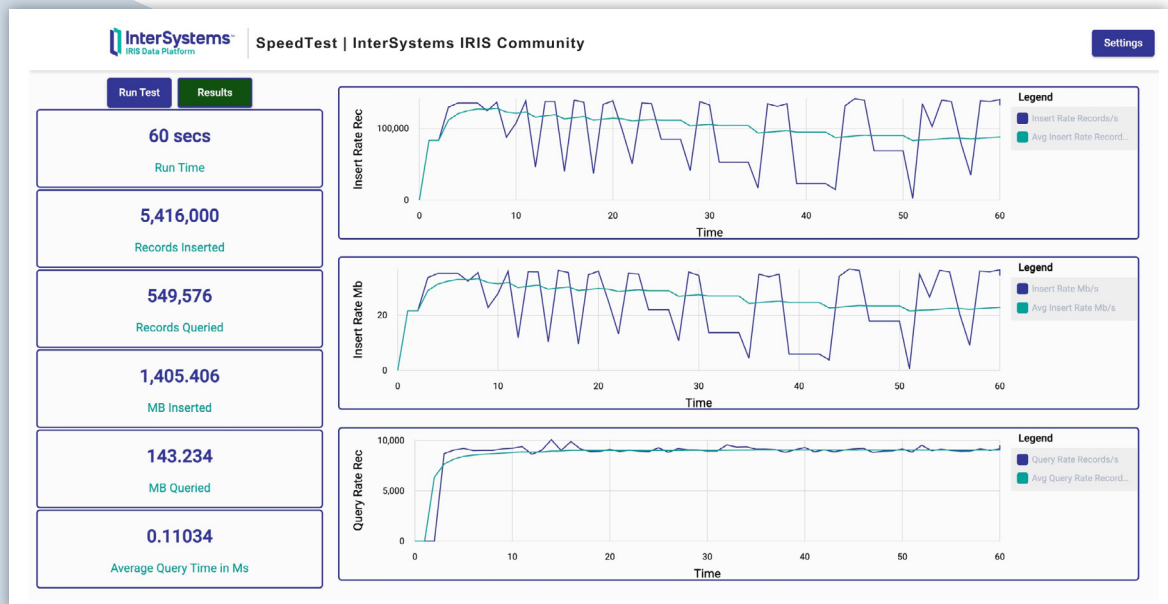


Figure 3: Speed test results for InterSystems IRIS: Rates and totals for record and MB insertions and queries

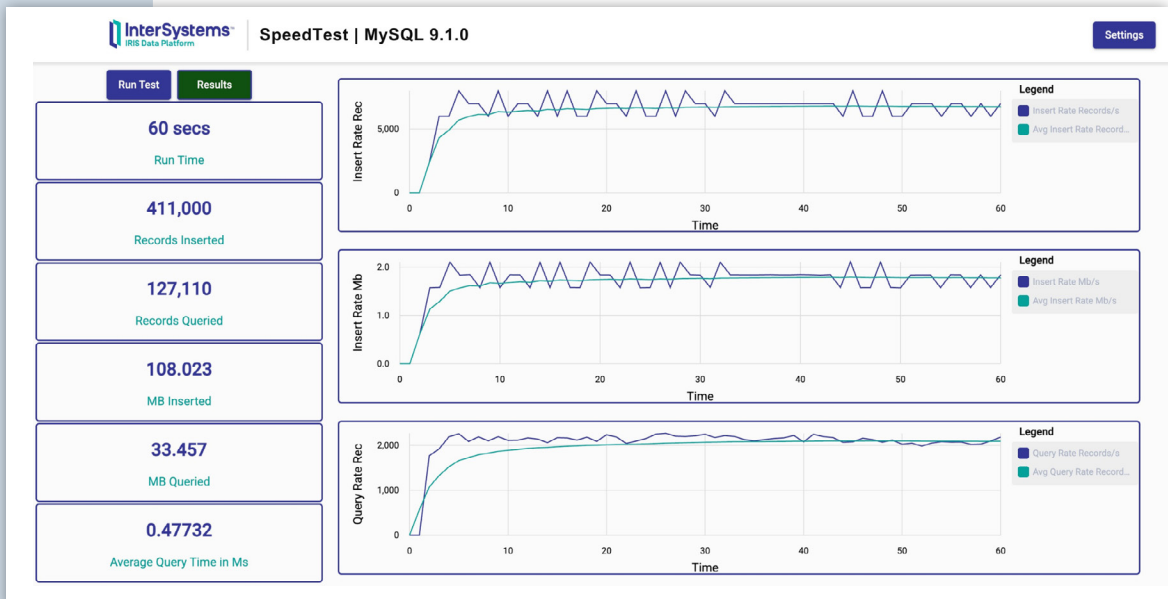


Figure 4: Speed test results for MySQL 9.1.0: Rates and totals for record and MB insertions and queries.

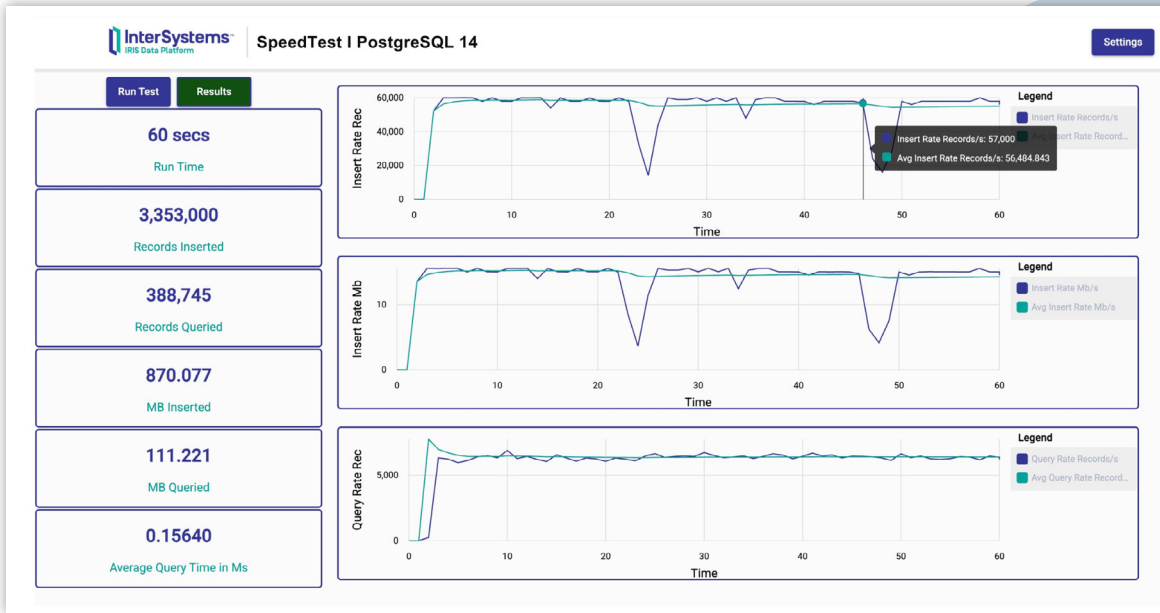


Figure 5: Speed test results for PostgreSQL 14: Rates and totals for record and MB insertions and queries.

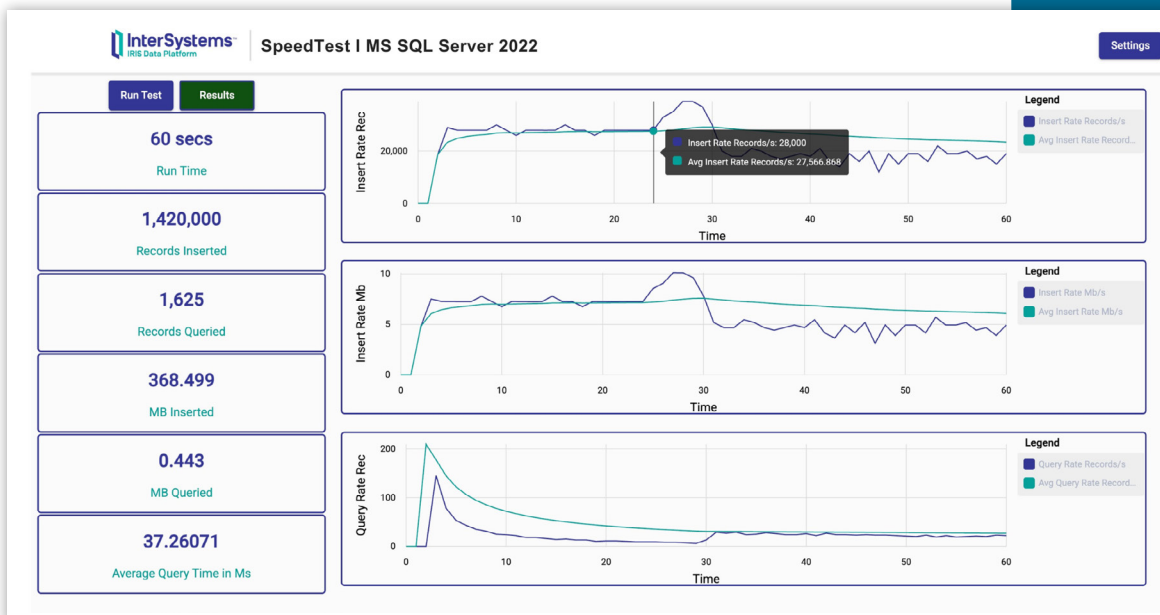


Figure 6: Speed test results for MS SQL Server 2022: Rates and totals for record and MB insertions and queries.

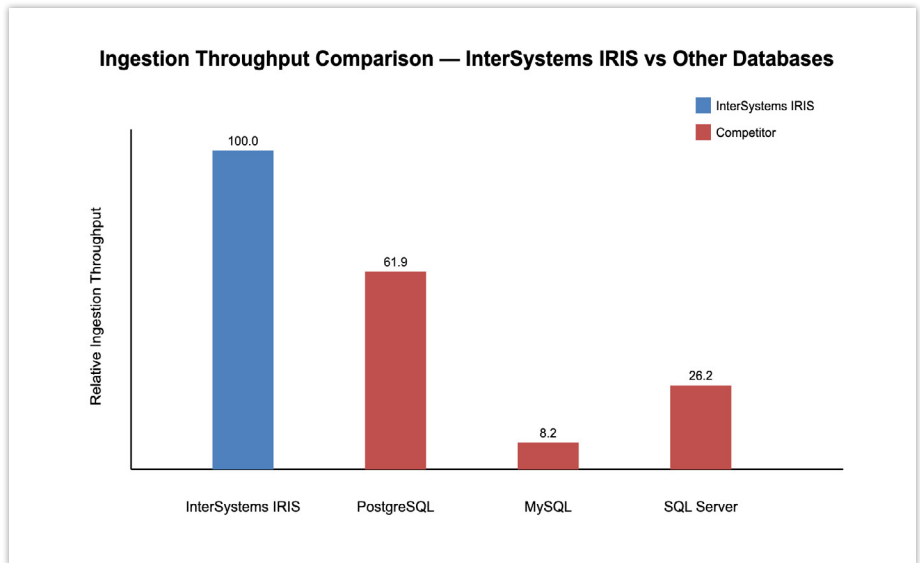


Figure 7: Comparison of data ingestion rates: InterSystems IRIS versus others.

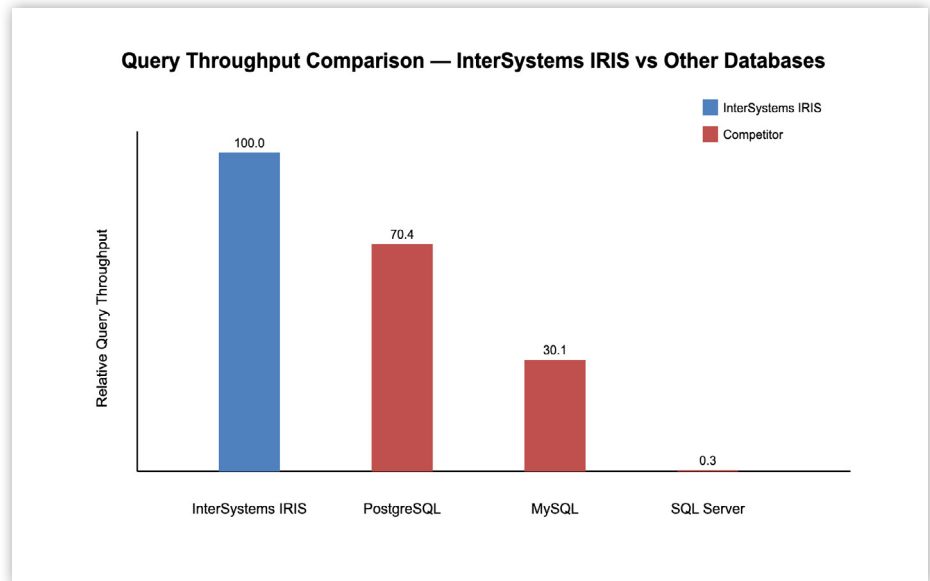


Figure 8: Comparison of data query rates: InterSystems IRIS versus others.

Conclusion & Significance

Among the databases compared in this paper, InterSystems IRIS demonstrates the strongest overall HTAP performance, consistently outperforming PostgreSQL, MySQL, and SQL Server across both ingestion and querying workloads. Unlike competitors, InterSystems IRIS maintains **high throughput on both transactional and analytical operations simultaneously, without the trade-offs or degradation** seen in other platforms. It also delivers top performance using default settings, showing superior architectural efficiency for read/write-intensive workloads. These results highlight InterSystems IRIS as the most capable and balanced platform for real-time, mixed operational and analytical processing.

Run the Benchmark Test

If readers want to run these comparisons themselves on either Windows or AWS, the test files are available from InterSystems:

<https://openexchange.intersystems.com/package/iris-speed-test-1>.

Database Benchmark by Winter Corporation

On the basis of its own tests, WinterCorp recommended that companies with needs for low latency, high performance transactional-analytical data management software seriously consider InterSystems IRIS, which compares favorably to all alternatives tested on AWS on a single node and in 1- to 4-node clusters. Compared to the tested alternatives, InterSystems IRIS shows significant advantages in query and ingestion throughput, data latency, and query efficiency without special tuning or configuration.

Refer to WinterCorp's paper, focusing on speed and data latency, The InterSystems Speed Test: Comparison of Performance and Data Latency in Operational Cloud Database Systems, available here:

<https://www.intersystems.com/resources/the-intersystems-speed-test/>

Recognition and Praise from Analysts

Multiple industry analyst firms, such as Gartner® have recognized InterSystems and InterSystems IRIS for technological leadership and high marks from customers, including some of the database management industry's highest rankings in cloud-based and operational database management systems, among other rankings from analyst firms such as IDC and KLAS Research and peers.

More information available here:

<https://www.intersystems.com/recognized-by-top-analysts/>

About InterSystems

Established in 1978, InterSystems is the leading provider of next-generation solutions for enterprise digital transformations in the healthcare, finance, manufacturing, and supply chain sectors. Its cloud-first data platforms solve interoperability, speed, and scalability problems for large organizations around the globe. InterSystems is committed to excellence through its award-winning, 24x7 support for customers and partners in more than 80 countries. Privately held and headquartered in Boston, Massachusetts, InterSystems has 37 offices in 28 countries worldwide. For more information, please visit [InterSystems.com/IRIS](https://www.intersystems.com/IRIS)

