Axellio XpressFS™

Real-Time File System Performance for Streaming Time-Series Data

In today's data-driven environments, organizations face a growing challenge: how to ingest, process, and act on massive volumes of streaming time series data in real time, without running into the performance and scaling limits of traditional file systems. Whether supporting high-concurrency analytics, AI workloads, or mission-critical sensor data streams, existing storage architectures simply weren't built for the demands of low-latency, high-bandwidth data pipelines.

That's where Axellio's XpressFS™ comes in. Purpose-built for extreme I/O performance, scalability, and reliability, XpressFS is a streaming time series data file system that delivers blazing-fast throughput, simultaneous read/write access, and consistent performance at scale, all while preserving data integrity and maximizing the power of modern NVMe SSDs. XpressFS is built directly into all products within our Xpress Platform™.

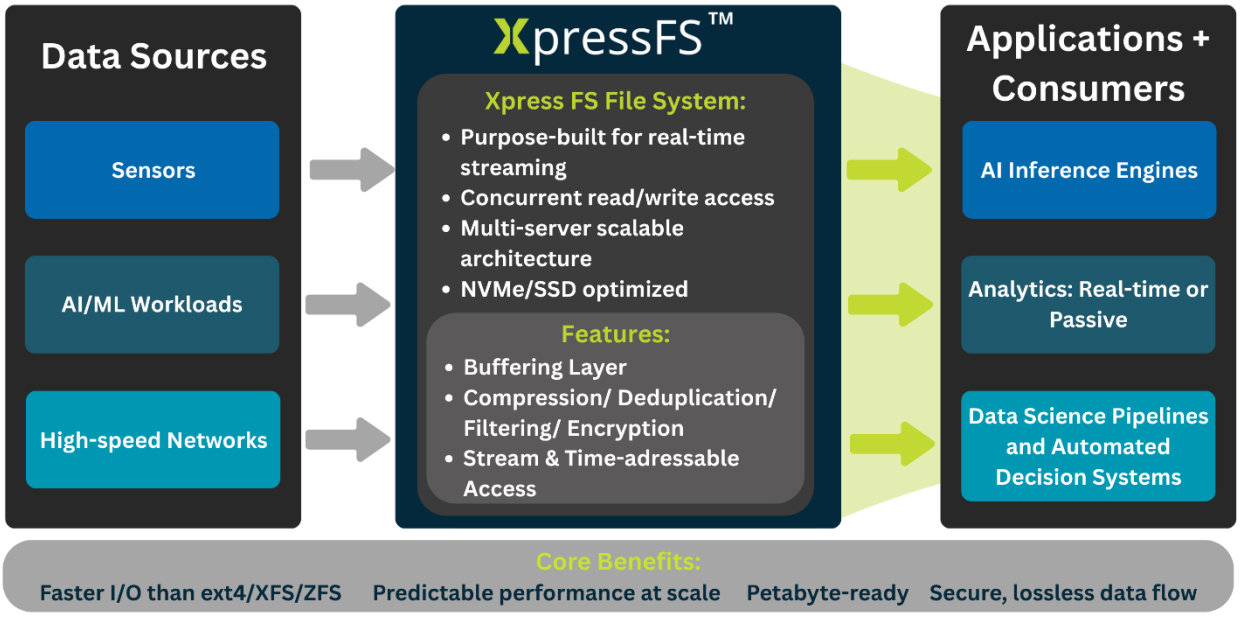

Figure 1: Axellio XpressFS framework

XpressFS: Engineered for High-Performance Streaming Data

At the core of Axellio's Xpress Platform is XpressFS, a file system purpose-built for real-time, streaming time series data. Traditional file systems like ext4, XFS, and ZFS were never designed for the low-latency, high-throughput demands of today's data-intensive environments. XpressFS overcomes these limitations with a modern architecture that delivers faster I/O, predictable scalability, and true real-time performance. This makes it ideal for high-speed networks, large radio frequency collections, AI workloads, large-scale analytics, and continuous data ingest.

Designed for high-concurrency operations, XpressFS offers simultaneous read/write access to eliminate I/O bottlenecks and decouple data ingest from distribution. This allows applications to consume and act on data as it's captured, without waiting for ingestion to be completed. Built-in buffering supports client applications in high-throughput environments, ensuring consistent delivery and performance.

Engineered for Real-Time Performance

XpressFS is optimized to leverage the full speed of modern NVMe and SSD storage, outperforming general-purpose Linux file systems that struggle under extreme streaming workloads. It also supports both stream and time-addressable access, through standard APIs or direct mounts, enabling more flexible and intelligent data handling.

To maintain performance at scale, XpressFS supports multi-server deployments at Tbps speeds and petabyte-level storage workloads, all while preserving data integrity and ensuring lossless ingest. It integrates key data services: including compression, deduplication, filtering, and encryption directly into its architecture, without sacrificing speed.

Key benefits include:

- Faster I/O throughput than ext4, XFS, or ZFS
- Concurrent read/write operations with built-in buffering
- Scalable and predictable performance across massive data volumes
- Optimized SSD/NVMe utilization for real-time streaming
- Consistent, lossless data flow and distribution for reliable downstream processing

Real-World Benefits

By enabling real-time, high-speed access to streaming time series data, XpressFS allows organizations to unlock actionable insights faster, increase infrastructure efficiency, remove costly appliances for virtualization of analytic layers, and scale seamlessly as data volumes grow. Centralized, high-performance storage reduces the need for multiple systems or redundant infrastructure, helping organizations lower total cost of ownership and minimize operational overhead. Applications that rely on continuous data streams can now operate at full speed, without compromise.

Adaptable to Any Environment

Our Xpress Platform running XpressFS can be deployed on-premises in high-performance data centers, across multi-node clusters for large-scale workloads, or integrated into AI/ML pipelines and analytics frameworks requiring low-latency, high-bandwidth storage.

Access Performance at Scale

Unlock the full potential of your streaming and time series data with XpressFS. Process, analyze, and act on information in real time, at scale, and without compromise — all while reducing infrastructure costs. Whether you are powering AI-driven analytics, mission-critical sensor networks, or high-concurrency data pipelines, our Xpress Platform containing our real-time file system, XpressFS, ensures that your applications have instant access to the information they need. It not only accelerates insight generation but also future-proofs your infrastructure, allowing you to scale confidently as data volumes grow. Take control of your data pipeline, unlock high-speed throughput, and start turning streaming data into actionable intelligence today.