QUANTUM ATFS

FEATURES & BENEFITS

Organize Your Data to Reflect Your Business

Classify and visualize dynamically to align with who needs to see what data, when. Create file system views without duplicating data to support collaboration, controlled access to data, and enable new investigations from a different perspective.

Data Insights Inform Automation

ATFS captures metadata and applies tags to data at ingest; data may be classified and organized to help link application workflows with access to relevant data. These insights inform how and where data is placed to support applications in real time.

Simple Management at Scale

The flexibility of the software eliminates rigidity in selecting hardware and responds quickly to availability of innovative components.

Data Insights Drive Storage Resource Allocation and Utilization

Policy engine, using data insights, automates purposeful data placement. Data is moved to the media that is optimal at that time for the application's needs. The just-in-time placement of data drives efficiency and productivity gains.

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SOFTWARE DEFINES

Every system consists of hardware components and software. Innovative hardware without software is still just a bunch of hardware components. Software is what gives hardware a personality; software is what defines services the system can deliver. ATFS has put together a hardware platform using innovative components such as SMR and NVMe drives, multi-core processors, and dense disk enclosures. To make this hardware platform deliver business value, ATFS is a software stack that addresses the most pressing challenges organizations face in managing storage and data. The software features can be divided into eight sections: media management, purposeful data placement, application and workload integration, resiliency, file system architecture, support of public and private clouds, authentication and security, and ease-of-use.

Identify, classify, and organize data based on collected metadata and applied business-centric data tags.

ATFS AT SCALE

ATFS may be deployed as a single file system or many file systems (<10K) depending on organizations' needs. Quotas, hard at the file system level and soft at the data level, are supported. Data stored in different directories and file systems may be moved around and viewed in a new, virtual file system or tags view, used to isolate data for collaboration or compliance purposes based on tags and metadata. NFS v.3, v.4 and SMB2.1, SMB3, as well as cross protocol support is available. ATFS file system can scale from a few files to billions with superior performance in file metadata operations.

Zero Touch Classification uses preset rules to tag data as it is ingested into the system.

Regular Expression Classification enables the use of wild cards, seeking files in a sequence or with key words.

All files entering the system are tagged using Zero Touch Tagging, based on preset rules, Regular Expression tagging, or via integration with applications and workflow managers. These tags are stored together with file metadata enabling real-time monitoring and file and metadata searches, and automated, purposeful data placement. Tags and metadata can trigger movement of data across media types, file system views, or geographic locations. Data can be kept locally, moved to the cloud, or shared with others within and outside of the organization. Tags may also be used to define and execute on data lifecycle management.

INTEGRATION WITH YOUR APPLICATION ENABLES AUTOMATION

Using API and integration with applications and schedulers, ATFS can place data where and when it needs to be. The system responds to the demands of the application in real-time; ATFS can prefetch required data into read cache for superior accuracy and performance.

Media Asset Management (MAM) tools can tag data to assist with identifying data and its place in the workflow. In addition to MAM and other workflow management tools, policies may be set up to automate data placement over data's life cycle.

For organizations that leverage scripts today, ATFS has incorporated into its user interface a scripting assistant. An administrator tells the wizard what is required, and the wizard provides information what should be included in the script. The script assistant simplifies the creation of and optimizes efficacy of scripts.

SEAMLESS BRIDGE TO THE CLOUD

ATFS manages all file system configurations, attributes, and layout in a database structured format. This enables the system to seamlessly tier to both public and private clouds. ATFS can write to the cloud in two modes: managed and native. In managed mode, data placed in an a cloud bucket continues to be managed by ATFS and requires ATFS to retrieve it. In native mode, data is written to cloud bucket with all the file structures in place, allowing anyone with ability to read native cloud protocols to access data without going through ATFS. In both modes, metadata and tags remain in ATFS.

ATFS treats cloud storage as another media type, optimizing writes for maximum capacity utilization.

SMARTER COMPLIANCE AND SECURITY

ATFS supports Active Directory and user roles with different access permissions. Combined with the unique ability to create virtual file system views, users may have access interface with a subset of the system without gaining access to the system at large. This provides a way to securely collaborate or sequester data for governance, regulatory, or privacy compliance.

ATFS tags all data coming into the system and captures its metadata. If a file enters the system from an unknown source, it can be tagged and an alert sent to notify administrators that an unknown data has entered the environment.

Deleted files may be kept in the garbage bin for an extended period of time to protect against unintended deletions or corrupted versions. Access to the deleted files may be limited based on roles.

MANAGE WITH SIMPLICITY AT SCALE

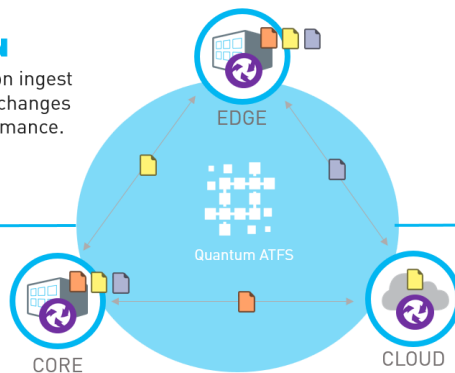### INSTANT DATA CLASSIFICATION

Automatically classifying data on ingest via rules engine without client changes and with zero impact to performance.

REAL-TIME SEARCH & ANALYTICS

Instantly find and retrieve the files you need.

EDGE

Quantum ATFS

CORE

CLOUD

STORAGE PLATFORM

Delivers storage services via NFS v3,4 and SMB v2.1,3 with dynamic data placement architecture across NVMe, SMR, and Cloud.

Managing ever increasing amount of data and corresponding storage resources is a personnel drain and a risk to the business. Simplifying management is key to supporting data at scale. ATFS's focus on simplicity is apparent in customizable reports and dashboard views, consistency in management across systems on premise and in the cloud, and real time status updates and problem and resolution alerts.

Troubleshooting starts with a timely alert (negative) to notify of the problem; ATFS also issues an alert (positive) when the problem has been resolved, keeping operations, system administrators, and users up to date in real-time. All systems have the call home feature; systems are monitored and issues may be proactively mitigated. Environments that don't allow external network connections may turn the call home function off.

ARCHITECTED WITH AN EYE TO THE FUTURE

At ingest, data lands in the write buffer where it is aggregated into optimal page sizes for the type of media being used. The ability to customize writes based on media enabled ATFS to incorporate next generation media as they become commercially available and have the cost/capacity/performance profile desired by the organization.

Similarly, other hardware components may be incorporated based on application and business needs and industry developments. The flexibility of the software eliminates rigidity in selecting hardware and responds quickly to availability of innovative components.

SYSTEM RESILIENCY AND DATA PROTECTION

The system has been designed to leverage erasure coding to prevent data corruption and loss. Parity is calculated across all the drives in the system with 14:2 protection ratio. The implementation of erasure coding supports fast drive rebuilds without performance impact on the overall system.

ATFS has instituted file versioning with time-based retention. Versions, as a default, are created when a file has changed. Users may also set version creation and retention based on a time table determined by the business.

CONCLUSION

Software defines; software is what gives hardware its personality and purpose. ATFS' storage software stack delivers a unique, dynamic platform for managing storage and data. Like a grocery store where all products have barcodes and are tracked, ATFS collects metadata and tags data to keep track of every component of the system. This data is further used to deliver superior efficiency, consistent performance, ability to automate tasks and integrate with application for real-time responsiveness to workflow needs, and insights to understand how resources are being used and what and how data is stored.

Automate tasks, simplify management at scale, and protect investments.

Software Feature	Description
Classification Rules Engine	Leverage Zero Touch rules engine to generate data tags. Tags combined with metadata serve to facilitate classification on ingest.
Real-time Search	Proactive data classification via tags and metadata stored in a structured database format enable real-time searches without crawling the file system.
Purposeful Data Placement	Policies set per class of data trigger data placement based on performance, resiliency, access, or location requirements of the application.
Versioning	Versions of files are created on a pre-set time increment. Versions may be retained as long as business requires.
Data Retention Management	Versions of data may be retained for extended periods of time. Data deleted is placed in the garbage bin and separate retention rules can set up for deleted data. This helps prevent unintended data loss due to human error.
NFS v3, v4 and SMB 2.1 and 3.0	Data may be written and read via NFS and SMB. S3 is supported as a backend protocol for data movement.
Cross Protocol Support	Data written via NFS may be read via SMB and vice versa.
Active Directory Integration	AD support for SMB, UI, and API access. Trusted domains and encrypted AD server communications. Posix attributes for UX are also supported.
Bridge to the Cloud	Data may be placed in the cloud in native or managed format without affecting end users view of their data. Native format allows data to be directly read via S3. In both cases, ATFS retains all file system formats, metadata, and tags.
ATFS	ATFS's file system supports >10K file systems and billions of files.
System and Data Resiliency	Ingest buffer, metadata and tagging data are mirrored across NVMe fabric. ATFS supports minimum 14:2 erasure coding using all bulk storage drives in the system. Data in read cache is protected in bulk storage.
Virtual FS views	All data, regardless of directory placement, may be aggregated into virtual file system views with separate access controls, resiliency policies, and placement requirements.
Call Home	All systems are equipped with call home features. This allows for proactive monitoring and problem identification and resolution.
Future-proof system	ATFS's software stack is designed to adjust writes based on the needs of the media. New media types may be incorporated with optimal utilization results.
Alerts	Negative alerts notifying of issues are sent based on home call monitoring. Positive alerts are sent out once resolutions have been applied.
Customizable Dashboard	View real-time metrics on performance, usage, tags in use, and other relevant metrics. Custom reports may be set out of information exported to other monitoring tools.
Application/API Integration	Allow applications, MAM, schedulers and other workflow managers to tag data, initiate data placement for performance, archiving, or deletion, establish retention, and facilitate collaboration.
Data prefetch/Read-ahead	Initiating a file read will result in prefetching of the remainder of the file. Files stored in a sequential order will get prefetched when one of the files is accessed. Prefetching is always on.
Networking Support	Supports multiple VLANs, allowing a single ATFS system to be multi-homed to serve clients on disjoint networks. Active/standby and LACP load balancing across multiple physical interfaces is supported via 10, 25, 40, 50, and 100 Gigabit Ethernet.

Quantum.

Quantum technology and services help customers capture, create, and share digital content—and preserve and protect it for decades at the lowest cost. Quantum's platforms provide the fastest performance for high-resolution video, images, and industrial IoT, with solutions built for every stage of the data lifecycle, from high-performance ingest to real-time collaboration and analysis and low-cost archiving. Every day the world's leading entertainment companies, sports franchises, research scientists, government agencies, enterprises, and cloud providers are making the world happier, safer, and smarter on Quantum. See how at **www.quantum.com**.

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