aspera
an IBM® company

Aspera for EMC Isilon Scale-out NAS

Ultra high-speed transport and storage

The explosive growth of unstructured data across virtually all industries, and the speed with which enterprises need to access that data have created a "big data" challenge that cannot be solved with traditional network and storage technologies. The emergence of faster wide-area networks (WANs), faster CPUs, and larger storage arrays has further highlighted the problem - reliable movement and storage of massive bulk data over global distances cannot be achieved with solutions that are based on traditional software architectures and technologies with inherent bottlenecks in performance and scalability.

Transfer tools that use traditional network protocols fail to utilize the available bandwidth, while traditional server and storage operating systems experience performance bottlenecks from CPUs, disk IO, and file system overhead. To meet the extreme business requirements of big data access, transfer, and storage, solutions must overcome the limiting factors associated with conventional network protocols, servers, and storage systems.

ASPERA FASP™ HIGH-SPEED TRANSFERS

Aspera's unique software and solutions provide high-speed, predictable and scalable transfers regardless of the size of data and the distance between the data source and the storage system. Behind Aspera's transfer technology is an embedded, patented, high-speed protocol called FASP™, which eliminates the fundamental bottlenecks of conventional and accelerated file transfer technologies. FASP provides high-speed, reliable transport over public and private IP networks, independent of network delay and robust to extreme packet loss, from data source to data destination.

ASPERA ENTERPRISE SERVER FOR ISILON ONEFS

Aspera's high-speed transfer software coupled with EMC® Isilon® OneFS® operating system and Isilon scale-out NAS delivers an integrated solution uniquely enabled to transfer and store file assets of any size, with maximum speed, over any IP network, with complete bandwidth control and security. This cost-effective and breakthrough solution delivers extreme performance and reliability of scale-out NAS across highlatency and low bandwidth networks. Transfers occur at maximum speed, fully utilizing the allocated bandwidth while being fair to other critical network traffic. Transfers are fast, stable, robust and predictable, even for the largest files, most challenging networks, longest distances, and highly concurrent and loaded transfer scenarios.

SUPPORT FOR COMMON USE CASES

The joint Aspera / Isilon solution can be deployed to support a wide set of common use cases including replacing CIFS mounts for user uploads and downloads from a central cluster, automating data movement for processing, multilocation synchronization and replication, and data migration to and from other storage systems.

HIGH-SPEED PERFORMANCE OVER ANY DISTANCE

Aspera software runs natively and is fully integrated with Isilon OneFS. Aspera's storage rate controller is purposebuilt to maintain maximum IO and throughput end-to-end, cluster-to-cluster. Through Aspera FASP, file transfers occur at maximum speed, over 1000x times faster in WAN conditions, while efficiently using the available bandwidth. File transfer bottlenecks across the network and to the storage are eliminated.

SINGLE FILE SYSTEM

The Isilon server and storage tier are collapsed into a single, common storage and transfer management pool, simplifying the management of multiple FASP processes running on multiple cluster nodes. As file transfer needs expand, simply add performance or capacity to the Isilon cluster, without having to manage servers and storage separately and with no downtime.

SCALE OUT PERFORMANCE

The joint solution enables linear scale-out transfer performance for both single and concurrent transfers. Aspera FASP transfers can be easily scaled out across nodes in the Isilon cluster to achieve maximum aggregate throughput end-to-end.

COMPLETE CONTROL OVER PERFORMANCE

Aspera's unique adaptive rate control virtualizes performance management cluster-to-cluster. A single virtual link spanning multiple nodes allocates bandwidth and priorities to transfers. Combined with Isilon scale-out performance, this capability provides unmatched transfer management and bandwidth prioritization—enabling precision fairness to other network traffic. Bandwidth priorities can be assigned to individual transfers, down to the user, nodes, cluster, DNS name or IP address.

ALL-ACTIVE HIGH AVAILABILITY AND LOAD BALANCING

Isilon SmartConnect™ provides intelligent client connection load balancing and failover support for Aspera FASP clients. Through a single host name, SmartConnect enables client connection load balancing and dynamic Aspera FASP failover of client connections across storage nodes to provide optimal utilization of the cluster resources. SmartConnect is compatible with any Aspera FASP client or server.

Aspera for EMC Isilon Scale-out NAS

FEATURES AND BENEFITS

Maximum speed

Enables large data set transfers over any network at maximum speed, with full bandwidth utilization, source to destination, regardless of network conditions or distance - over 1000x times faster in WAN conditions.

Extraordinary bandwidth control

Provides precise prioritization and rate control (pre-set and on-the-fly) for guaranteed transfer times. Adaptive rate control fully utilizes available bandwidth while remaining fair to all other network traffic.

Robust and secure

Includes built-in security using open standard cryptography for user authentication, data encryption and data integrity verification. Automatically resumes partial transfers and retries failed transfers.
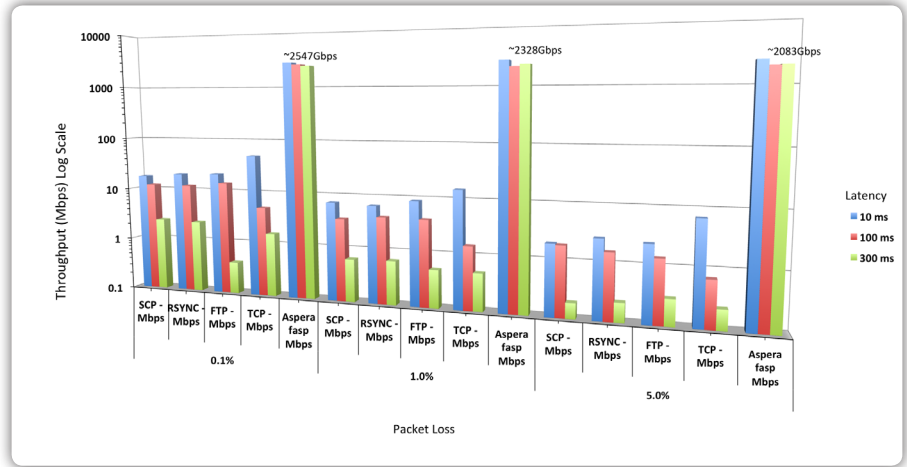
Scale-out performance

Scale-out to efficiently transfer during peak usage and high concurrency by assigning more bandwidth across a cluster, or adding additional nodes to the cluster. Scale-back during off-peak hours to reallocate cluster performance resources as needed.

Storage rate control

Integrated storage rate control for Isilon scale-out storage. Transfer IO and throughput can be controlled end-to-end, between and among multiple Isilon clusters globally, at prescribed transfer speeds.

Single management point

Aspera Console provides a single point of transfer management across nodes within a cluster, and across multiple clusters globally, for transfer control, reporting, and monitoring.

PERFORMANCE BENCHMARKS

Aspera and Isilon teamed up to demonstrate the performance capabilities of FASP™ running on OneFS, and the ability to scale out the performance over multiple Isilon nodes. The tests were performed on an Isilon S-Series 200 3 node cluster, comparing FASP to traditional transmission protocols by calculating the throughput from transferring files of various sizes (mean file size greater than 5MB), under varied WAN conditions. The comparison of FASP, SCP, RSYNC, FTP and TCP demonstrates that FASP eliminates the TCP bottleneck for the bulk data transmissions and improves the throughput by a factor up to thousands. Even more important, FASP transfer speeds are relatively constant over network WAN conditions ranging from 0 ms to 300 ms round-trip latency, and 0% packet loss to 5% packet loss! TCP based protocols drop by a factor of 1000X over the same conditions.

Band-width (Mbps)	RTT (ms)	PLR (%)	FASP w/ Cluster (Mbps)	Data Size (GB)	SCP (Mbps)	RSYNC (Mbps)	FTP (Mbps)	TCP (Mbps)	1 TB FASP (hours)	1 TB by FTP (days)	Speed Up
10000	10	0.1	2741.9	85871	17.6	20	21	49	0.8 hours	2.1 days	59 X
10000	100	1	2068.8	85871	3.6	4.2	4.1	1.5	0.8 hours	67.9 days	1971 X
10000	300	5	1975.4	85871	0.192	0.224	0.3	0.23	0.9 hours	442.6 days	11944 X

In another set of tests, under the same varying WAN conditions (latency: 10ms, 100ms, and 300ms; Packet Loss: 0.1%, 1%, 5%), results conclusively showed the benefits of running Aspera FASP on Isilon OneFS. Throughput reached 2711.9 Mbps resulting in a transfer time of under 1 hour, compared to 2.1 days for FTP - a 59 times improvement. As latency increased to 300ms, and packet loss increased to 5%, FASP performance remained relatively constant compared to the other tools. FTP performance degraded to .3 Mbps, and a transfer time equivalent to 442.6 days. while FASP transferred at a sustained throughput of 1975.4Mbps and delivered the files in under an hour, a 11944 times improvement.

About Aspera

The creator of next-generation transport technologies that move the world's data at maximum speed regardless of file size, transfer distance and network conditions. Based on its patented FASP™ protocol, Aspera software fully utilizes existing infrastructures to deliver the fastest, most predictable file-transfer experience. Aspera's core technology delivers unprecedented control over bandwidth, complete security and uncompromising reliability. Organizations across a variety of industries on six continents rely on Aspera software for the business-critical transport of their digital assets.

Learn more at www.asperasoft.com and www.emc.com/isilon