Four Ways High-Speed Data Transfer Can Transform Oil and Gas

WHITE PAPER

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OVERVIEW

Technology has transformed the Oil and Gas industry, improving the capability to find, extract, and process raw materials more quickly and efficiently than ever before. The transition from 2D to 3D seismic exploration has improved the quality of information available during exploration. High performance computing (HPC) centers provide sophisticated analysis of the data, improving the accuracy and efficiency in locating hydrocarbons. New technology invigorates existing wells allowing the capture of additional reserves by injecting liquids into the subsurface at the right angle and location.

However, these technology improvements have created new challenges in the capture, transport, processing and distribution of the resulting data. By switching to 3D shoots, the size of pre-stack data has increased by up to 7x. These multi-terabyte data sets generated by 3D seismic exploration need to be moved from remote fields to HPC centers where they can be analyzed and eventually shared with other service providers and oil producers for further analysis and interpretation.

With all the industry innovations, the methods used to move these massive data sets has for the most part remained the same. Data is frequently stored on disk and physically shipped, introducing costly delays and additional risk of data loss. Legacy transfer tools such as FTP and HTTP are equally slow and inefficient, especially over long-haul Wide Area Networks (WAN). Both are based on TCP, which performs poorly over networks with high latency and throughput degrades dramatically as distance, file size and packet loss increases. Even the promise of faster data delivery utilizing WAN Accelerators falls short. The data caching and compression techniques used by these costly appliances are ineffective against the constant creation of new and unique data sets.

Maximize Transfer Speed with the Aspera Advantage

Aspera software is uniquely designed to transfer large files and data sets at maximum speed, fully utilizing the available bandwidth, regardless of file type, size,

ASPERA FASP™ PERFORMANCE

		Across US		US to Europe		US to Asia	
		10 GB	100 GB	10 GB	100 GB	10 GB	100 GB
FTP	45 Mbps	10 to 20 Hours	Impractical	15 to 20 Hours	Impractical	Impractical	Impractical
	100 Mbps						
	1 Gbps						
	10 Gbps						

Aspera *fasp* Transfer Speeds are Location Agnostic

		10 GB	100 GB	10 GB	100 GB	10 GB	100 GB
Aspera *fasp*	45 Mbps	32 Min	5.3 Hrs	32 Min	5.3 Hrs	32 Min	5.3 Hrs
	100 Mbps	14 Min	2.3 Hrs	14 Min	2.3 Hrs	14 Min	2.3 Hrs
	1 Gbps	1.4 Min	14 Min	1.4 Min	14 Min	1.4 Min	14 Min
	10 Gbps	8.4 Sec	1.4 Min	8.4 Sec	1.4 Min	8.4 Sec	1.4 Min

Aspera transfer times shorten linearly with bandwidth Independent of packet loss, delay (network distance)
Cross US - Add 1% to 5%   Intercontinental - Add 1% to 10%   Satellite - Add 1% to 10%

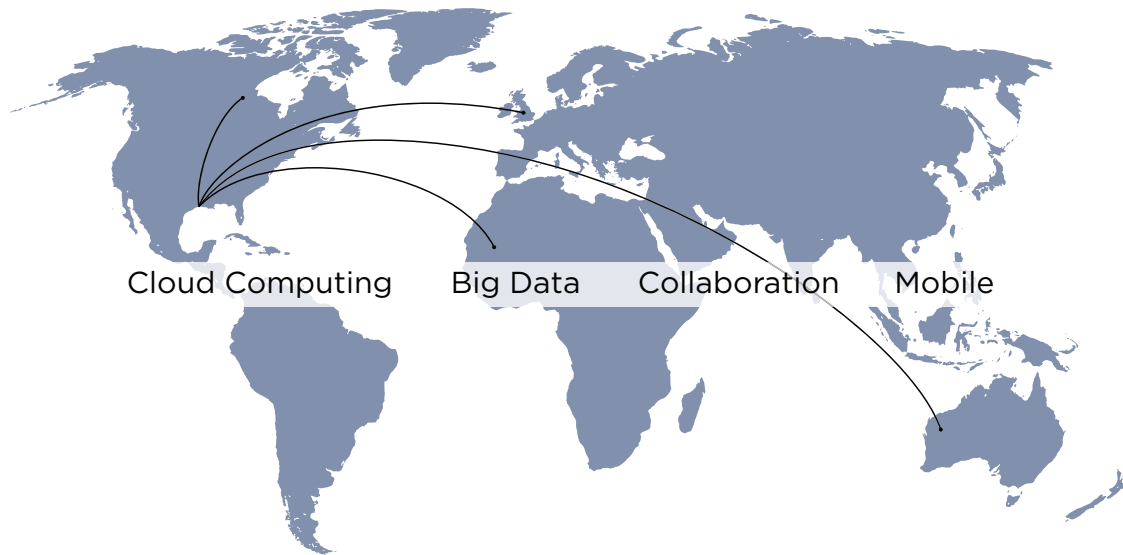# Four Ways High-Speed Data Transfer Can Transform Oil and Gas

transfer distance or network conditions. At the heart of the Aspera solution is the innovative and patented FASP transport technology – a breakthrough transfer protocol that leverages existing WAN infrastructure and commodity hardware to achieve speeds that are hundreds of times faster than FTP and HTTP, and delivers end-to-end security, 100% reliability and exceptional bandwidth control.

1. ACCELERATE THE ACQUISITION OF REMOTE SENSING DATA

In the Oil and Gas industry, data such as seismic data, sensor data, well-logs, or even aerial surveys can be generated and collected from anywhere in the world.

Today the sensing data gathered is frequently stored on disk and physically shipped, resulting in costly delays. This pre-stack data needs to be transferred at speeds faster than FTP and HTTP in order to accommodate real-time analysis.

Aspera enables the quick and efficient transfer of any sized remote sensing data from anywhere in the world (including land, water, and air) to any existing infrastructure (including cloud and on-premise locations) using any network connection (including satellite, 3G or 4G, Wi-Fi, and fiber). With Aspera, data can be sent securely, at high-speed with predictable delivery times, thus eliminating the cost, delays, and risks associated with physical media shipments.

Cloud Computing   Big Data   Collaboration   Mobile

ANY REMOTE LOCATION	ANY LARGE DATA SETS	ANY NETWORK	ANY INFRASTRUCTURE
LAND AIR OFFSHORE	PRE & POST-STACK DATA • SEISMIC • 3D • WELL-LOGS • AERIAL PHOTOS SENSOR DATA	SATELLITE 3G, 4G WI-FI FIBER	ON PREMISE CLOUD HYBRID

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2. MAXIMIZE HPC UTILIZATION

To shorten processing times, large unprocessed pre-stack data can be sent to HPC centers around the world for staging and analysis. During peak load times, it is not uncommon for processing jobs to be backed up and queued. The Oil and Gas industry needs to be able to efficiently and quickly balance processing load, leverage underutilized computing resources, and optimize processing across these HPC centers.

With Aspera high-speed transfer, large data sets can be quickly moved from an over-provisioned HPC to

an under-provisioned HPC where processing can begin immediately. The ability to enable large-scale data migration or transfer from one HPC center to another can help balance processing load, leverage underutilized computing resources, and optimize processing across HPC centers. Afterwards, the processed post-stack data can be stored, easily accessed, and securely transferred to users regardless of where the user is located.

HIGH-SPEED DATA TRANSFER ACROSS HPC CENTERS

Aspera can help balance processing load, leverage under utilized computing resources, and optimize processing across HPC Centers.

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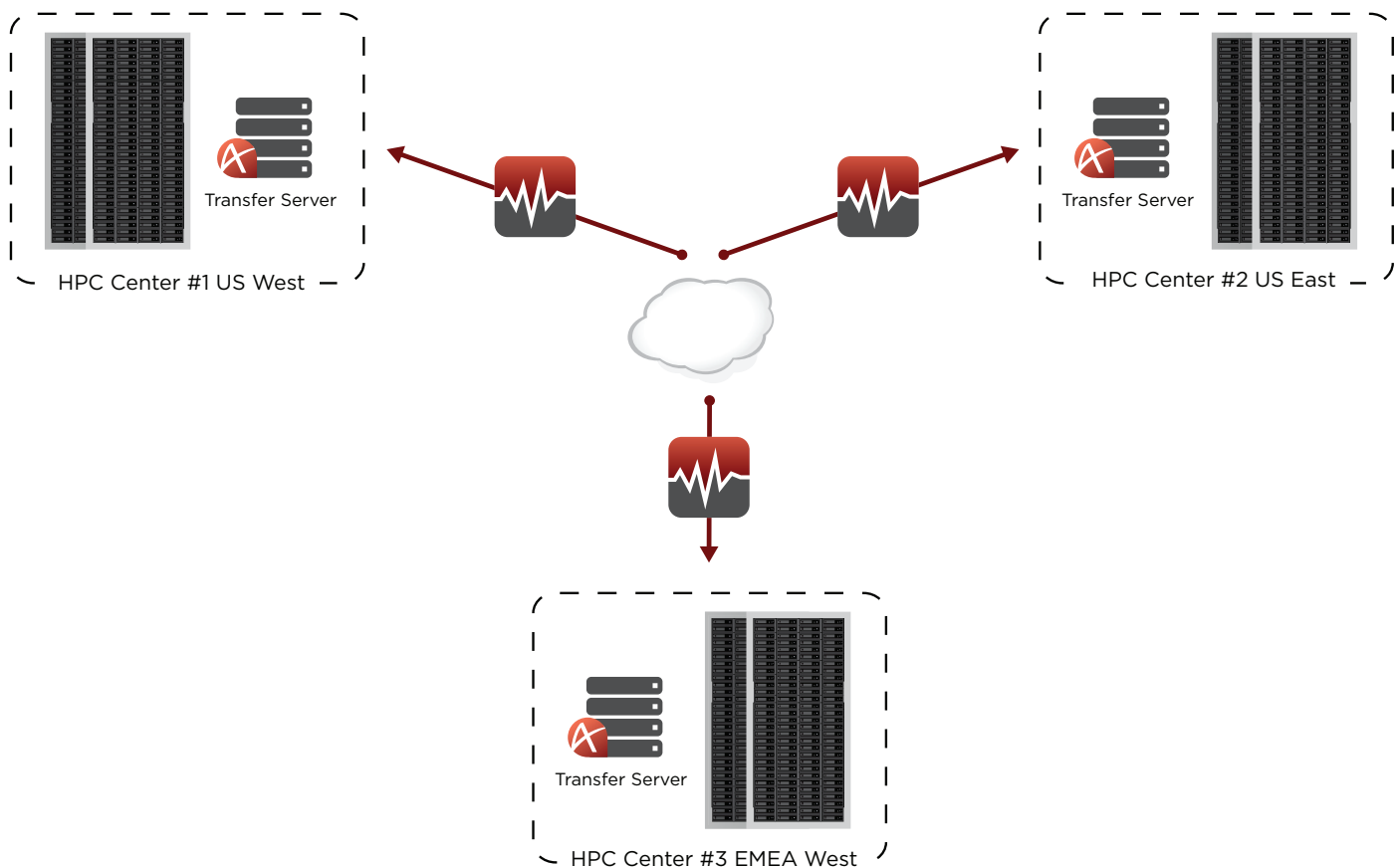
3. SIMPLIFY AND OPTIMIZE DATA DISTRIBUTION

After processing, the post-stack data is shared with geophysicists, petroleum engineers and potentially other service providers to determine the next course of action. The large post-stack data needs to be distributed and exchanged over global distances at transfer speeds dictated by business needs and not by infrastructure limitations. Furthermore, the data set is extremely valuable to their business and must be protected with bulletproof security for transport, data integrity validation, data encryption over the wire and at rest, and user access control.

Aspera's collaboration and sharing applications enable fast and secure distribution and exchange of these large data sets over global distances. Aspera's FASP high-speed transport delivers reliable, ultra-fast transfers, enterprise-grade security, and precise control over transfer settings and user access. The applications are deployable on premise in private data centers and in public, private, or hybrid cloud platforms. Aspera web applications are designed for extreme scalability and can seamlessly support thousands of concurrent transfers within a globe-spanning network of Aspera transfer servers and clients.

SECURE AND HIGH-SPEED DATA DISTRIBUTION

Aspera offers high-speed, secure data transfer over global distances for a wide variety of users (geophysicist, petroleum engineers, analyst, partners, etc).

Field Operations

Shares Web Tier

DMZ

Datacenter, Houston, TX

Cloud Private or Public
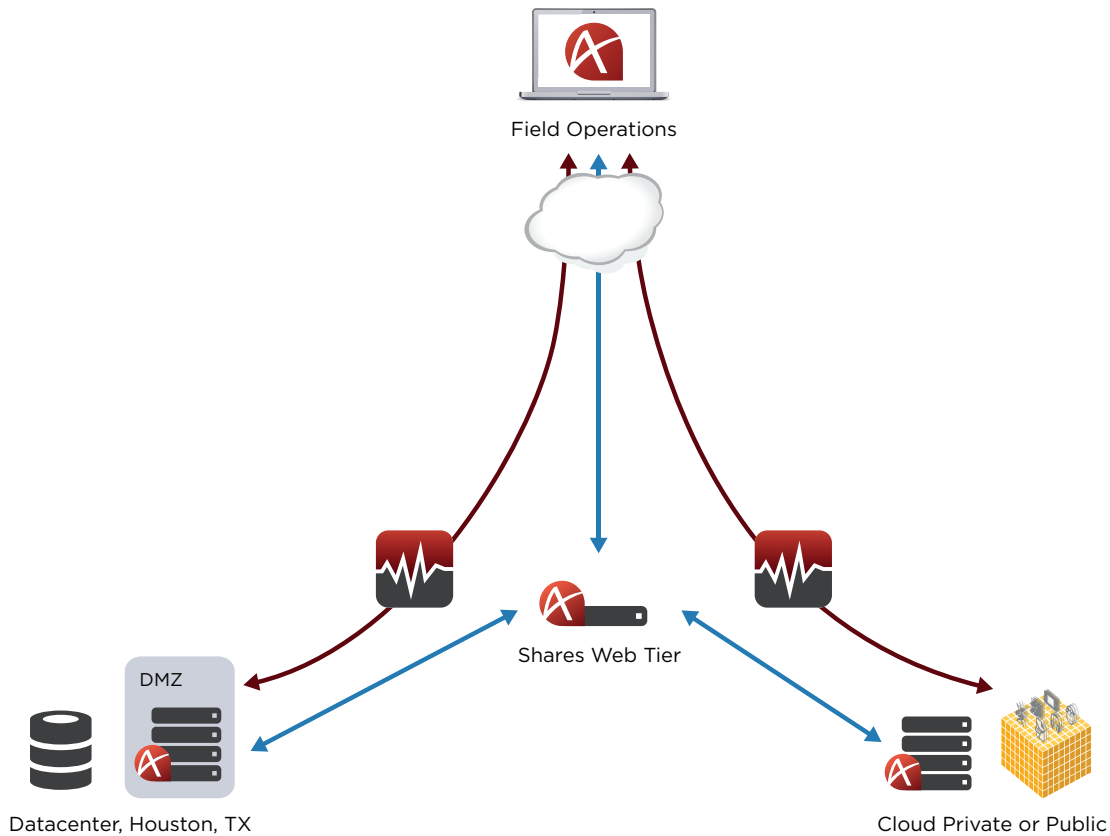
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4. IMPROVE BUSINESS CONTINUITY

The size and volume of data being collected and processed by the Oil and Gas industry have created a challenge to synchronize the large files and large file systems located worldwide. The Oil and Gas industry needs to protect against unplanned outages or data loss, which requires the replication and synchronization of petabytes of data and tens of millions of files to Disaster Recovery locations at high-speed.

Petabyte-sized production file systems can be mirrored to offsite systems using Aspera Sync high-performance synchronization and replication software. With FASP-powered transfers, high-speed replication from primary to backup sites completes within small operational windows, ensuring data and applications are protected within stringent recovery point objectives (RPO) and recovery time objectives (RTO), thus enabling the data to be available even after a system outage or site loss.

DISASTER RECOVERY

Disaster Recovery / Business Continuity

Primary Site   Alternate Site

System Mirroring

Web Application

Primary Site   Mirror Site
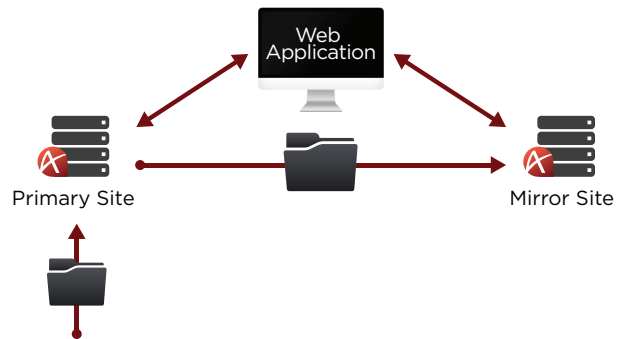
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ASPERA ADVANTAGE

Maximize Transfer Speed

Aspera provides transfer speeds that are up to hundreds of times faster than standard FTP. Transfer times are highly predictable, regardless of network conditions, enabling companies to send mission critical data anywhere in the world. In contrast to TCP, FASP throughput is independent of network latency and robust to extreme packet loss that can be found on intercontinental WANs, satellite, Wi-Fi or 3G or 4G connections.

The Oil and Gas industry can utilize Aspera high-speed transfer software to move any large data sets ranging from raw pre-stack data such as seismic data and well-logs to post-stack data. Aspera can enhance any existing infrastructure and support any deployment scenario including on premise and public, private or hybrid cloud deployments.

Adaptive Bandwidth Control

The bandwidth utilization algorithm in FASP enables fast, automatic discovery of the bandwidth capacity and its full utilization while remaining fair to other traffic. FASP also supports on-the-fly configurable bandwidth sharing policies so that users may pre-set and change individual transfer rates and finish times. This ensures that business-critical TCP traffic such as remote feedback data and business applications can function normally while allowing FASP to transfer at maximum speed.

Enterprise Grade Security

The pre-stack data and post-stack data is a critical asset in the Oil and Gas industry and needs to be protected accordingly. The FASP protocol provides a comprehensive built-in security model that does not compromise transfer speeds. Aspera protects vital digital assets with thorough SSH authentication, data encryption in-transit and at-rest with AES-128 cryptography, and data integrity verification for each transmitted block.

About Aspera

Aspera is the creator of next-generation transport technologies that move the world's data at m aximum 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 unrivaled control over bandwidth use, complete security and uncompromising reliability. As organizations turn to the cloud for improved efficiency and unprecedented scalability, Aspera enables data- and processing-intensive workflows with high-speed transfer available on-demand and maximum speed ingest and distribution of big data to and from cloud storage. Organizations across a variety of industries on six continents rely on Aspera software for the business-critical transport of their digital assets.