Introduction to Aspera

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Cloud Architect - HCBT

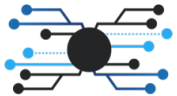
Agenda

- Trends -> Challenges migrating large amounts of data
- IBM Aspera
- Challenges with TCP and alternative technologies
- IBM Aspera- Key capabilities
- Cloud challenges - IBM Aspera Direct-to-Cloud technology
- Use cases
- Aspera platform overview & product offerings

Trends

Big data explosion

- 90% of digital data today file-based or unstructured
- Mix of file sizes—but larger and larger files the norm



Growth and diversity in IP networks – Media, bandwidth rates & conditions

- Variable bandwidth rates (slow to super-fast)
- Bandwidth rates increasing—costs decreasing
- Network media remains diverse (terrestrial, satellite, wireless)
- Conditions vary—all networks prone to degradation over distance

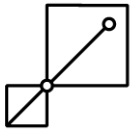
Global workflows – real time experiences over WANs are expected

- Teams are geographically dispersed
- Over distance, network conditions degrade to majorly impact large transfers & streams
- Contemporary TCP acceleration solutions not designed for big data transfer and replication

Cloud computing matures

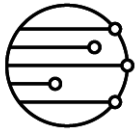
- More choices: IBM Cloud, AWS, Microsoft Azure, Google, Oracle, Alibaba, etc.
- No longer a niche – becoming prevalent across many industries including Media & Entertainment, Life Sciences, Manufacturing & Engineering, Financial Services, Oil & Gas, etc.

Challenges of migrating large amounts of data



Size & Volume

Can’t reliably send, share, and sync large files and data sets over global internet connections

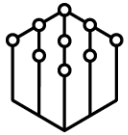


Speed

Unable to move big data at high-speed with existing network bandwidth

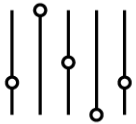
Distance

Subject to slower times and more congestion for global file transfers across public internet, corporate MPLS, wireless and mobile networks



Infrastructure

Limited options to access and store data to the cloud from on-premises infrastructures



Control

Need greater security & more control in moving files & data sets to employees, collaborators, & external data centers, without impacting other traffic

Why **IBM Aspera**?

Securely move data at **high speed** to, from and across on-premises and hybrid cloud environments regardless of **size, distance, and network conditions**

IBM Aspera’s mission

IBM Aspera’s next-generation transport technologies

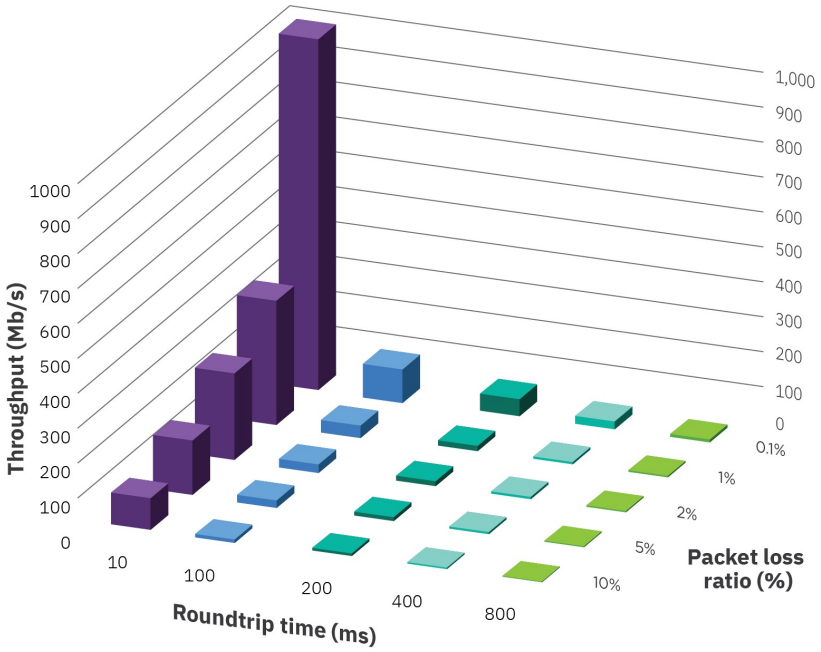
move the world’s digital assets at maximum speed,

regardless of file size, transfer distance and network conditions

Markets Served

Media and Entertainment	Federal Government	Engineering & Manufacturing	Architecture & Design
Life Sciences & Pharmaceutical	Healthcare	Software & Gaming	Financial Services
Oil & Gas	Enterprise IT	Advertising & Publishing	Legal & eDiscovery
Telecommunications	Cloud Computing	Consumer Products & Retail	Service Providers

Challenges with TCP and alternative technologies



Note: The relative bandwidth utilization for FASP transfers over a 1 Gbps network are immune to latency (distance) with very little effect from packet loss.

Distance degrades conditions on all networks

- Latency (or Round Trip Times) increases
- Packet loss increases
- Fast networks are just as prone to degradation

TCP performance degrades severely with distance

- TCP was designed for LANs; doesnt perform well over distance
- Throughput bottlenecks are severe as latency & packet loss increase

TCP does not scale with bandwidth

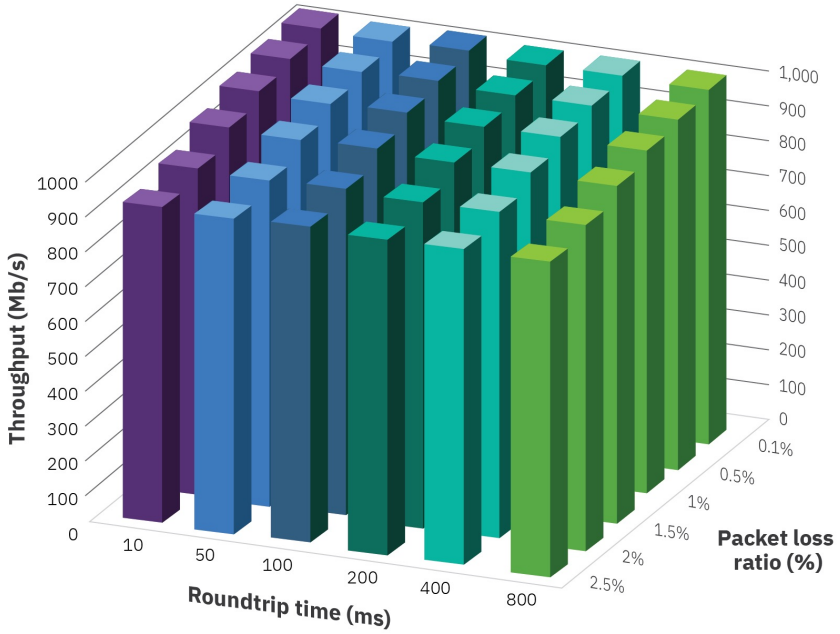
- TCP designed for low bandwidth
- Adding more bandwidth does not improve throughput

Alternative technologies

- TCP-based - Network latency & packet loss must be low to work well
- UDP blasters – Inefficient use of bandwidth leads to congestion
- Modified TCP – Does not scale well on high-speed networks
- Data caching - Inappropriate for many large file transfer workflows
- Data compression - Time consuming & impractical for some file types

FASP® – high performance data transport

Fast Adaptive and Secure **Protocol** (**FASP**)



Note: The relative bandwidth utilization for FASP transfers over a 1 Gbps network are immune to latency (distance) with very little effect from packet loss.

Maximum transfer speed

- Optimal end-to-end throughput efficiency
- Transfer performance scales with bandwidth independent of transfer distance and resilient to packet loss

Congestion avoidance and policy control

- Automatic, full utilization of available bandwidth (fair play)
- On-the-fly prioritization of transfers
- Set caps on bandwidth allocation for transfers

Uncompromising security and reliability

- Secure, SSH user/endpoint authentication
- AES-128 to 256 cryptography of every packet in transit
- Encryption at rest uses an additional password
- FIPS 140-2 compliant, built on the open SSL libraries
- Automatic resume of partial or failed transfers

Scalable management, monitoring and control

- Support highly concurrent transfers
- Real-time progress, performance and bandwidth utilization
- Detailed transfer history, logging, and manifest

Key Aspera capabilities

Performance at any distance

– Transfer up to 100s of times faster using built-in FASP® protocol

– Any size or volume

– Predictable and reliable

– Adaptive bandwidth control

– Achieve multi-Gbps speeds

High-speed data transfer across hybrid cloud infrastructures

MOVING A 10GB FILE		Across US	US - Europe	US - Asia
Legacy Transport	100 Mbps	10-20 Hours	15-20 Hours	Impractical
	1 Gbps			
	10 Gbps			
Aspera FASP®	100 Mbps	14 Min	14 Min	14 Min
	1 Gbps	1.4 Min	1.4 Min	1.4 Min
	10 Gbps	8.4 Sec	8.4 Sec	8.4 Sec

FASP – maximum speed with no network saturation

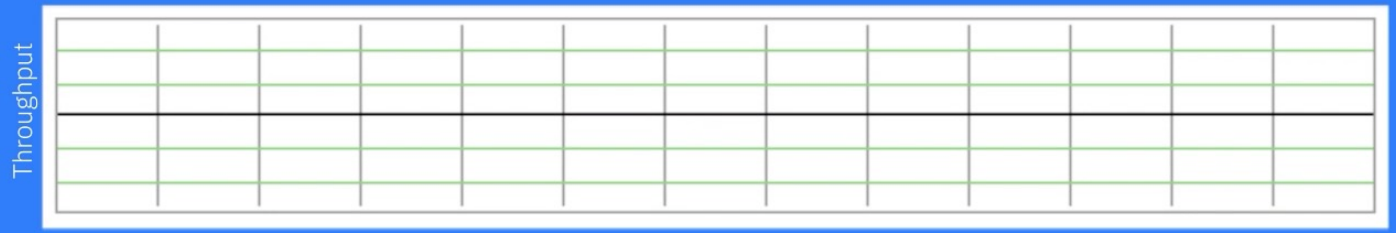
Extraordinary bandwidth control that doesn't saturate the network

- Automatic detection & full utilization of available bandwidth with "fair" policy protection of other network traffic
- Allows "bursts" in TCP traffic and reclaims unused bandwidth as it as it becomes available

Adaptive rate control delivers high performance without impacting business-critical network traffic.

Other Network Traffic

FASP®



FASP adaptive rate control

Real-time prioritization of transfers

- On-the-fly, per flow, user and job prioritization of transfers
- Concurrent transfers adjust bandwidth on the fly, allocating available bandwidth based on transfer priority

System-wide monitoring and reporting

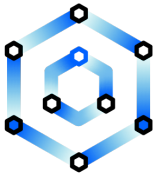
- Real-time progress and performance analysis along with detailed transfer history, logging and manifest

Cloud challenges

Challenges of multicloud data transfer

FTP & HTTP Timeouts

TCP-based transfers slow with distance and packet loss



Automating Transfers

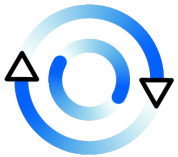
Manually scripting automated file processing is too complex

Need Faster, More Secure Delivery

Shipping hard disks increases risk of data getting lost in transit

Lack End-to-End Visibility

Activity tracking & reporting across hybrid infrastructures is difficult



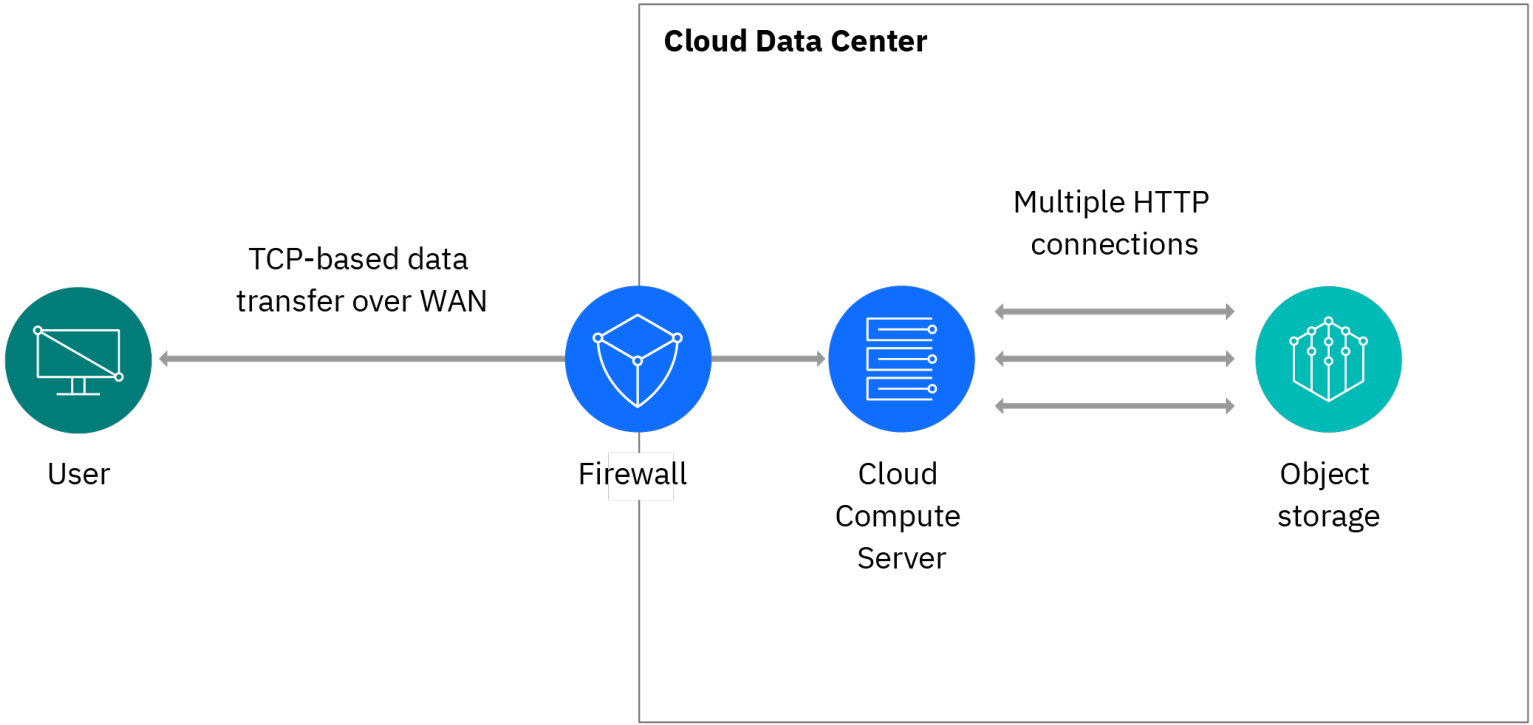
Accessing Data in a Hybrid Cloud

Data spread across storage locations can be difficult to access

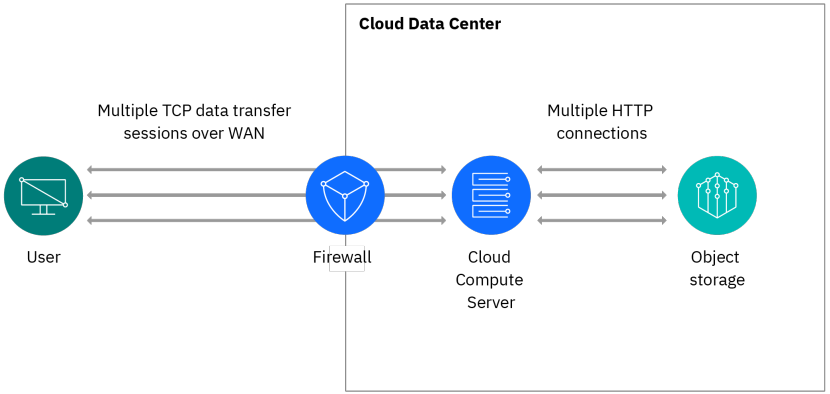
Securing Your Transfer Environment

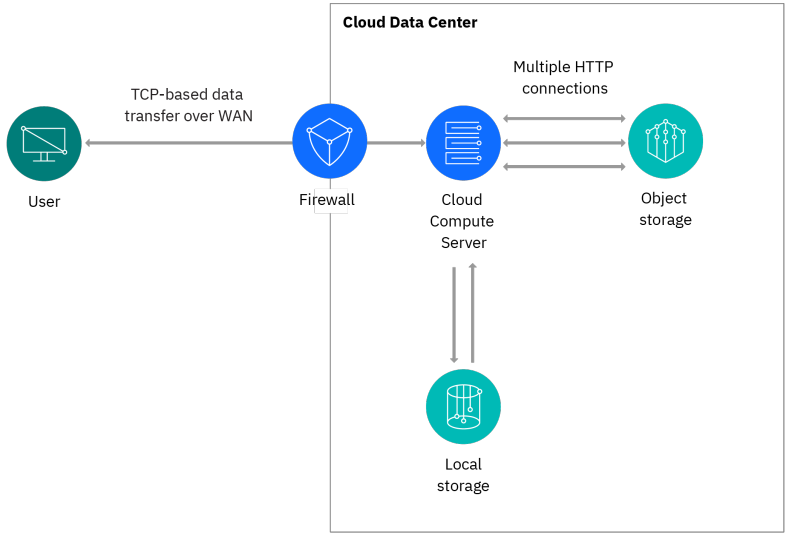
Enabling information exchange risks the exposure of your business' IP

WAN transfer challenge is compounded in the cloud



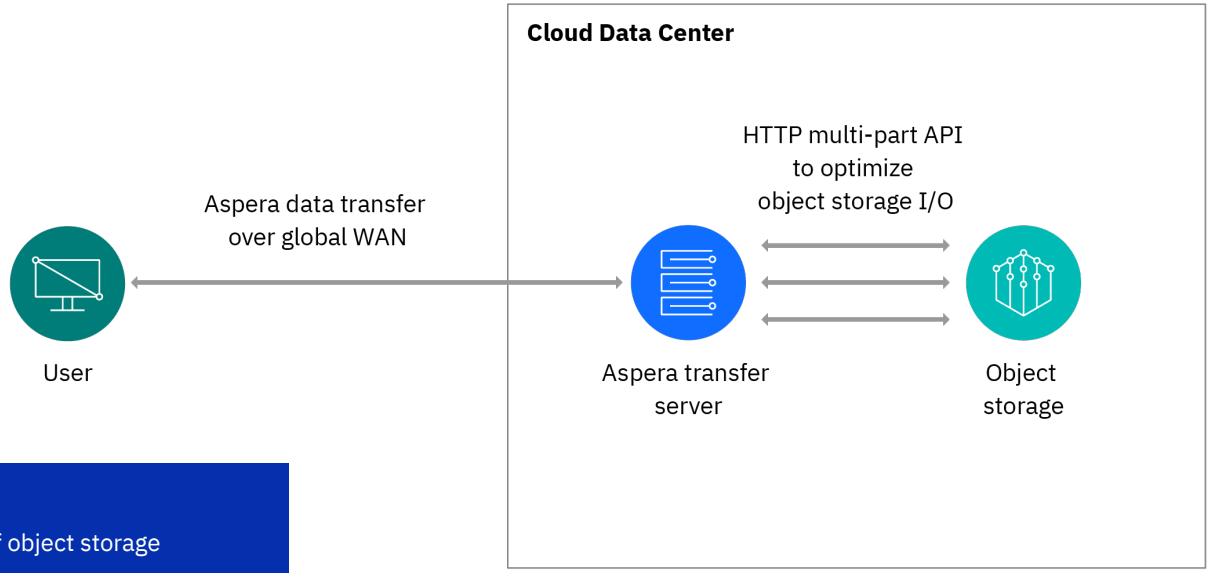
Traditional cloud transfer options





Both methods for writing to cloud object storage create **bottlenecks and unnecessary delays**

IBM Aspera Direct-to-Cloud technology



The Solution

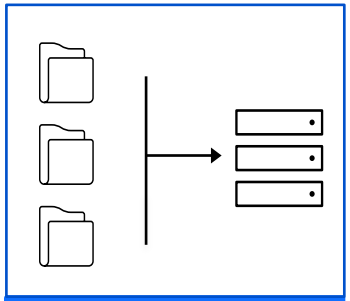
- Full client-side read/write of object storage
- Synchronous transfer from client to object storage
- FASP transfer speeds end-to-end
- Real-time optimization of chunk size for HTTP
- Up to 3.5Gbps over a single session (varies per cloud & instance type)
- Has achieved 100TB per 24 hours

IBM Cloud · aws · Microsoft Azure · Akamai · Google Cloud

AWS GovCloud (US) · NetApp · ceph · IBM Cloud Object Storage · HDFS · Limelight NETWORKS

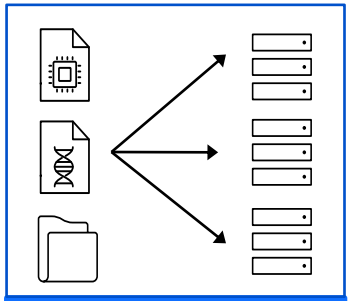
Aspera use cases and product portfolio

Key use cases



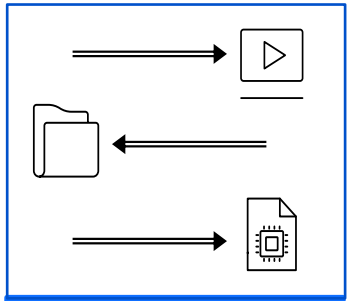
Upload & Ingest Large Data Sets

Migrate/upload massive volumes of data to cloud to cut costs and scale faster, e.g. Migrate to Cloud



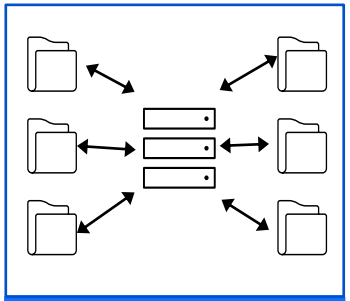
Distribute Data Globally

Quickly distribute globally to many target sites to accelerate workflows & deliverables, e.g. Retail, Distribution



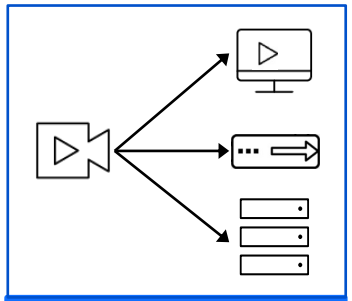
Share & exchange files & folders

Allow teams to quickly collaborate with huge files and data sets to boost productivity, e.g. Manufacturing Design



Replicate & Sync Datasets

Replicate data repositories. Decrease RTO/RPO to ensure business continuity and prevent data loss e.g. Devops Sync



Stream high-quality video & data

Stream high-quality video and data feeds over public Internet without modification across all platforms (server, desktop browser and mobile)

NETFLIX

BEST BUY

JABIL

NATIONAL INSTRUMENTS

FOX SPORTS

Aspera platform overview

Access & APIs

Web, Desktop, Email, Mobile, CLI, Custom App, SDKs, REST, Java & more

Delivery

Collaboration

Synchronization

Automation & Integration

Real-time visibility & control

Secure high-speed transfer clusters connecting public, private & hybrid clouds

IBM Cloud

aws

Microsoft Azure

Google Cloud

FASP® Patented High-Speed Transport

Any Data Size, Distance, Network | Any Storage: Block, Object, On Premises, Cloud | Any Data: Files, Streams

Aspera product offerings

Flexible licensing models

Software as a Service (SaaS)

- New Aspera on Cloud platform to transfer, exchange and automate the delivery of your data across public, private and hybrid clouds
- Includes monitoring, reporting, administration, and automation
- SaaS offering hosted on IBM Cloud

Perpetual software license with annual support and maintenance

- Host license per server, point-to-point, and web application servers
- Based on aggregate bandwidth
- Add-ons for High-Availability

On demand subscription service

- Monthly, Annual, Multi-year subscription services based on volume transferred
- Server On Demand, Application Platform On Demand, Shares On Demand, Faspex On Demand
- Add-on options: Clients, Sync, Autoscale
- Available on IBM Cloud, AWS, Azure, Google

Aspera Developer Network

Subscription service to comprehensive SDK, tools, utilities, sample code

For more information, contact aspera-sales@ibm.com
or visit us at www.ibm.com/aspera