ASPERA HIGH-SPEED TRANSFER SOFTWARE

Moving the world's data at maximum speed

PRESENTERS AND AGENDA

PRESENTER

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AGENDA

- How Cloud is used in Video Workflows
- Example: UFC and lessons learned
- Challenges of using Clouds

WHO IS ASPERA?

Software technology company innovating new data transfer solutions

Based in Emeryville California

Founded in 2004, privately held, now with 145 employees

Creators of the *fasp*™ protocol

- Innovative, patented, highly efficient bulk data transport technology
- Unique and core to Aspera's high-performance file transfer software suite
- Outperforms software and hardware WAN acceleration solutions
- Ranked first in every WAN transfer throughput benchmark

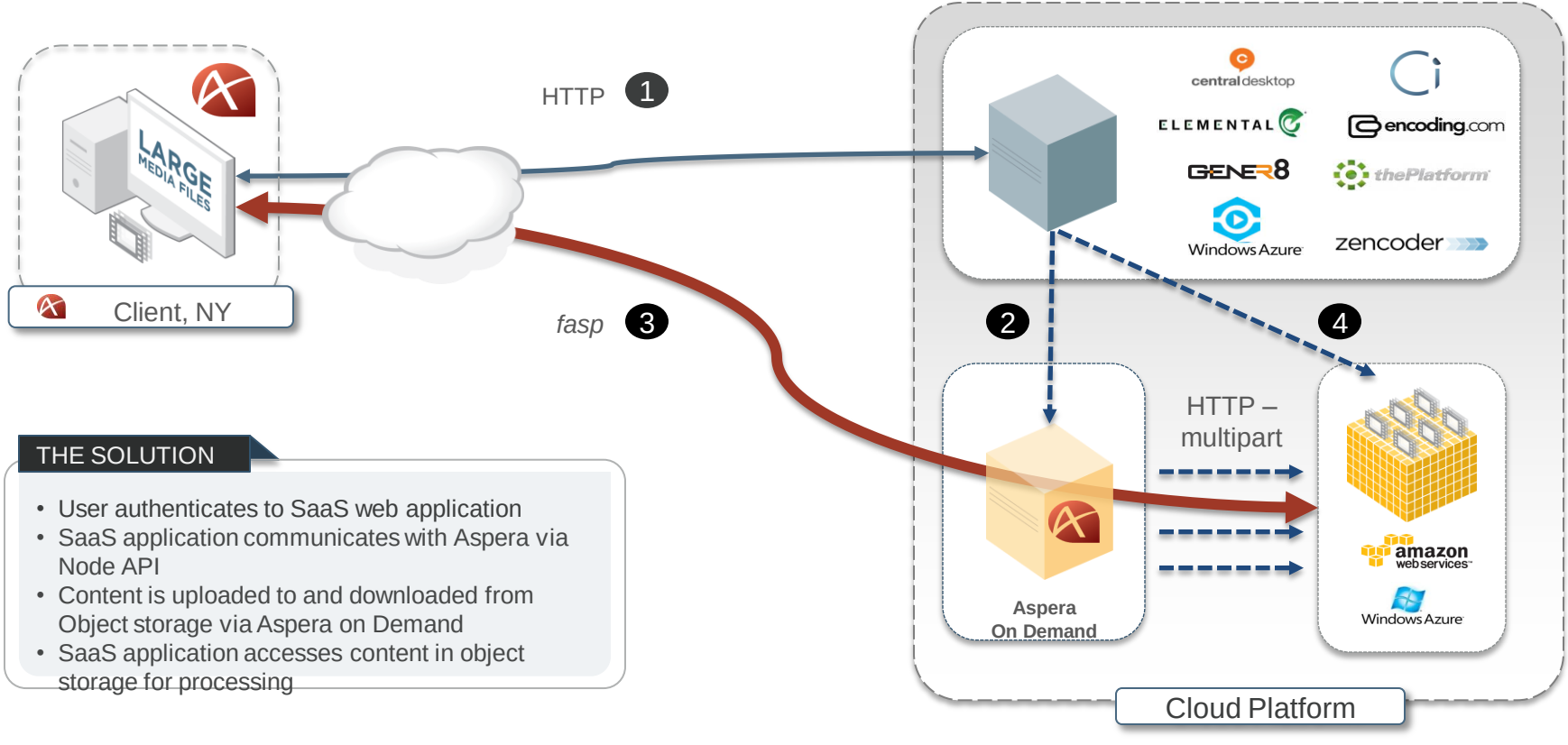
Patents: *fasp* Bulk Data and Dynamic Bandwidth Control issued in USA and 30 other countries, others pending in over 32 countries

Growth: over 2,100 customers, over 18,000 licenses, 50% year-over-year growth

Markets Served: Media and Entertainment, Federal Government, Life Sciences, Healthcare, Cloud Computing, Software and Gaming, Financial Services, Legal, eDiscovery, Engineering, Technology, Telecommunications, Service Providers, Architecture and Design, Enterprise IT

Global 24x7 Support: Support and sales offices in Sophia-Antipolis, Singapore, Virginia US, and Direct Sales and Sales Engineering throughout globe

ASPERA TRANSFER SERVER INTEGRATED WITH CLOUD SERVICES



THE SOLUTION

- User authenticates to SaaS web application
- SaaS application communicates with Aspera via Node API
- Content is uploaded to and downloaded from Object storage via Aspera on Demand
- SaaS application accesses content in object storage for processing

CHALLENGES WITH TCP AND ALTERNATIVE TECHNOLOGIES

Distance degrades conditions on all networks

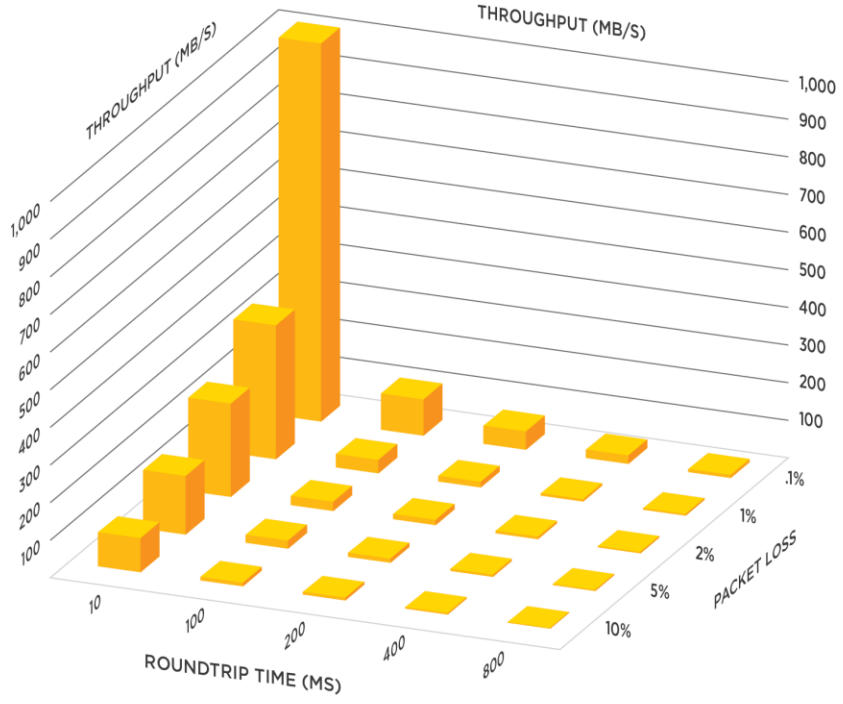
- Latency (or Round Trip Times) increase
- Packet losses increase
- Fast networks just as prone to degradation

TCP performance degrades with distance

- Throughput bottleneck becomes more severe with increased latency and packet loss

TCP does not scale with bandwidth

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



Alternative Technologies

- TCP-based - Network latency and packet loss must be low
- Modified TCP – Improves TCP performance but insufficient for fast networks
- UDP traffic blasters - Inefficient and waste bandwidth
- Data caching - Inappropriate for many large file transfer workflows
- Data compression - Time consuming and impractical for certain file types
- CDNs & co-lo build outs - High overhead and expensive to scale

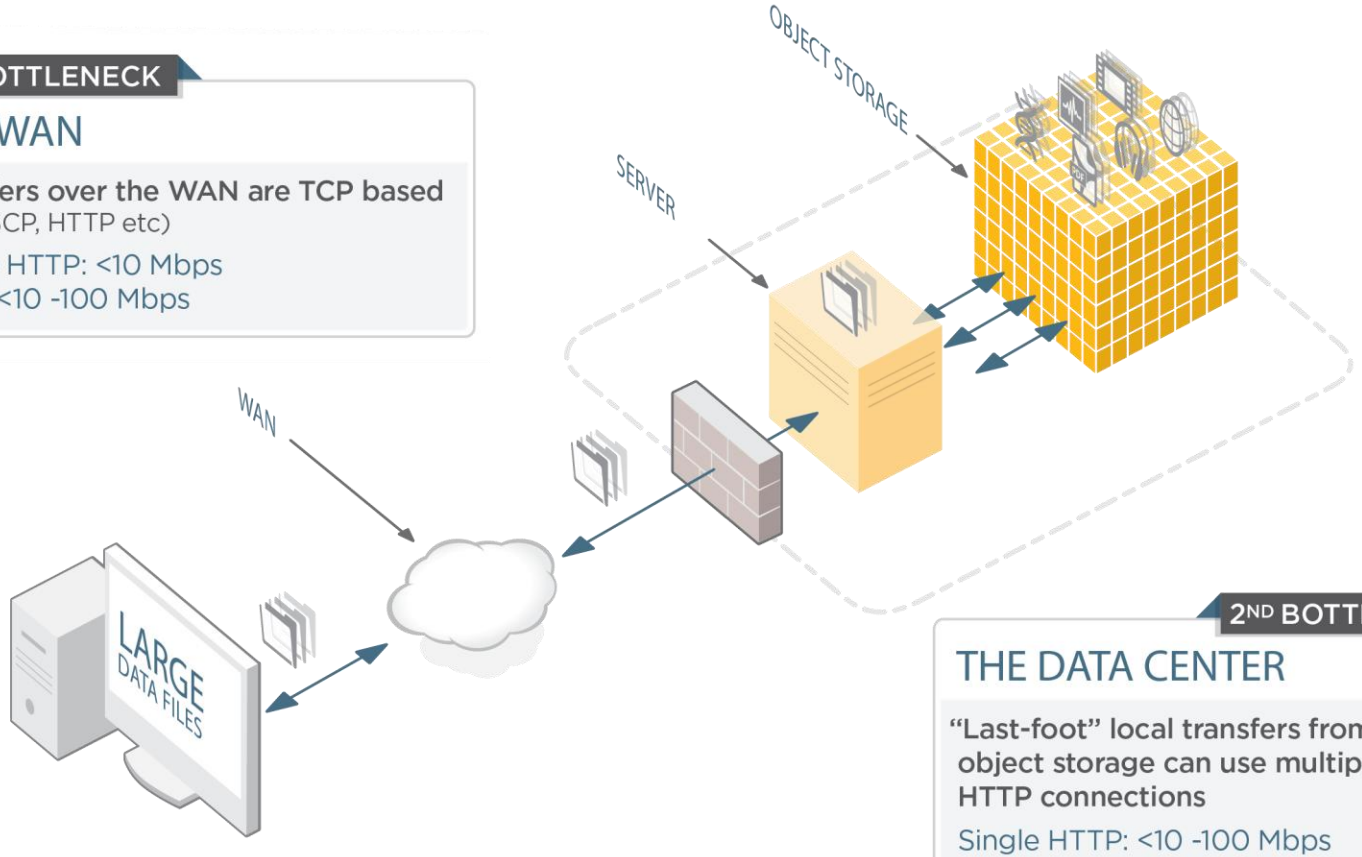
BIG DATA CLOUD – WHAT'S THE PROBLEM?

1ST BOTTLENECK

THE WAN

Transfers over the WAN are TCP based
(FTP, SCP, HTTP etc)

Single HTTP: <10 Mbps
Multi: <10 -100 Mbps



2ND BOTTLENECK

THE DATA CENTER

"Last-foot" local transfers from server to object storage can use multiple HTTP connections

Single HTTP: <10 -100 Mbps

ULTIMATE FIGHTING CHAMPIONSHIP (UFC)

About UFC

- UFC® is the world's leading promoter of mixed martial arts (MMA), with programming broadcast to half a billion homes throughout 150 countries

Challenge

- Fights are located worldwide, from Ireland to Brazil to Las Vegas, Nevada, frequently in locations with poor connectivity
- Transferring high-resolution video content from venue to host site in the cloud for scale-out transcoding

Solution

- Aspera On Demand Application Platform running on AWS EC2 instances and Connect browser plug-in to transfer video clips at high-speed from the different venues to AWS
- Production teams transfer the content from their laptops using the install-on-demand Connect plug-in, and the Aspera Application Platform stores the content directly in S3
- Parallel encoding jobs are automatically started using encoding.com's cloud-based transcoding service, which also backstops on AWS, and the resulting output files are stored back into S3, ready for distribution
- Final delivery of the device-specific content is accomplished using Amazon CloudFront, and all

FASP™ — HIGH-PERFORMANCE DATA TRANSPORT

Maximum line-rate WAN transfer speed

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

Congestion Avoidance and Policy Control

- Automatic, full utilization of available bandwidth
- On-the-fly prioritization and bandwidth allocation

Uncompromising security and reliability

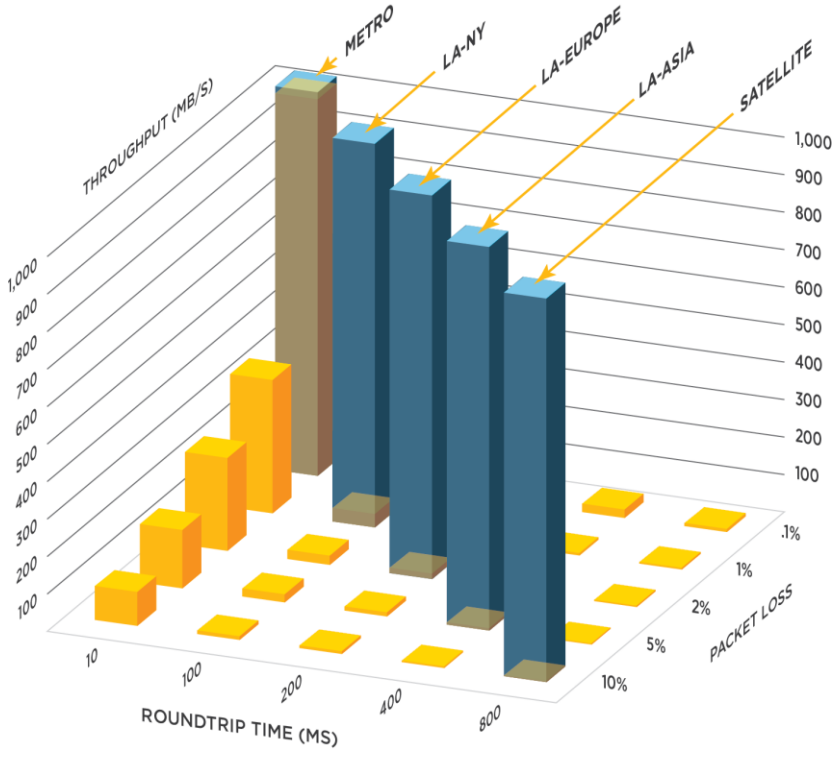
- Secure, user/endpoint authentication
- AES-128 cryptography in transit & at-rest

Scalable management, monitoring and control

- Real-time progress, performance and bandwidth utilization
- Detailed transfer history, logging, and manifest

Enterprise-Class File Delivery

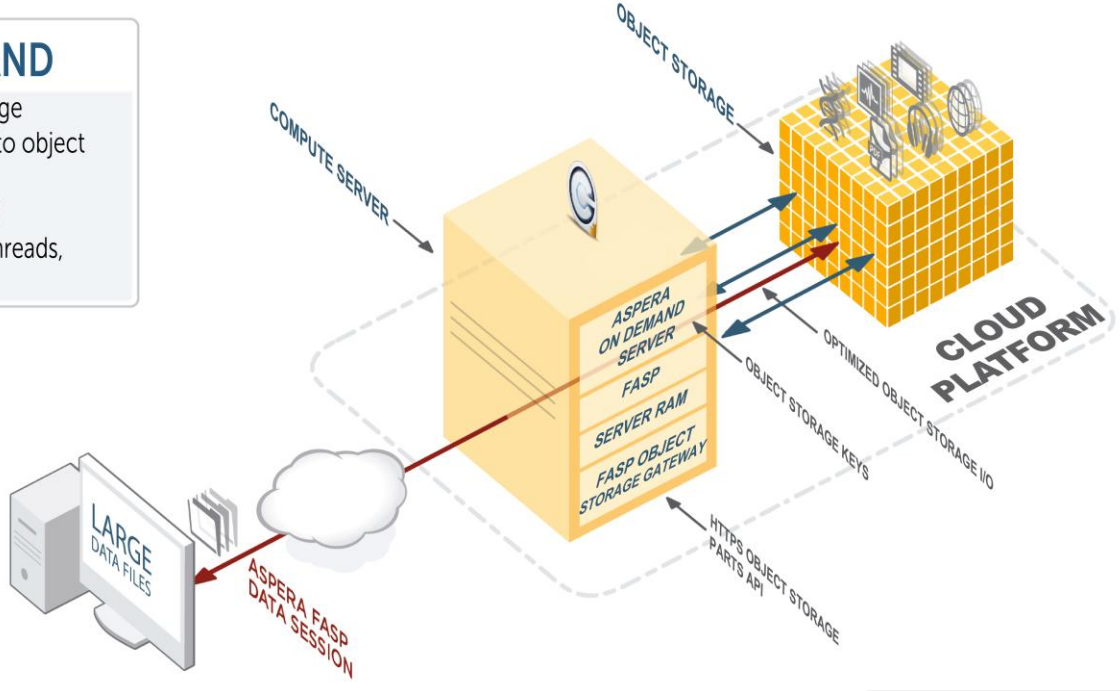
- Transfers up to thousands of times faster than FTP/HTTP(S)
- Precise and predictable transfer times
- Extreme scalability (concurrency and throughput)



HIGH SPEED TRANSFER TO CLOUD STORAGE
WITH DIRECT-TO-CLOUD

THE SOLUTION
ASPERA ON DEMAND
- Full client-side r/w of object storage
- Synchronous transfer from client to object storage (via Aspera On Demand)
- *fasp*™ transfer speeds end-to-end
- Real-time optimization of HTTP threads, chunk size, interfaced to *fasp*

Client Software
client
connect plug-in
point-to-point
cargo downloader
mobile apps

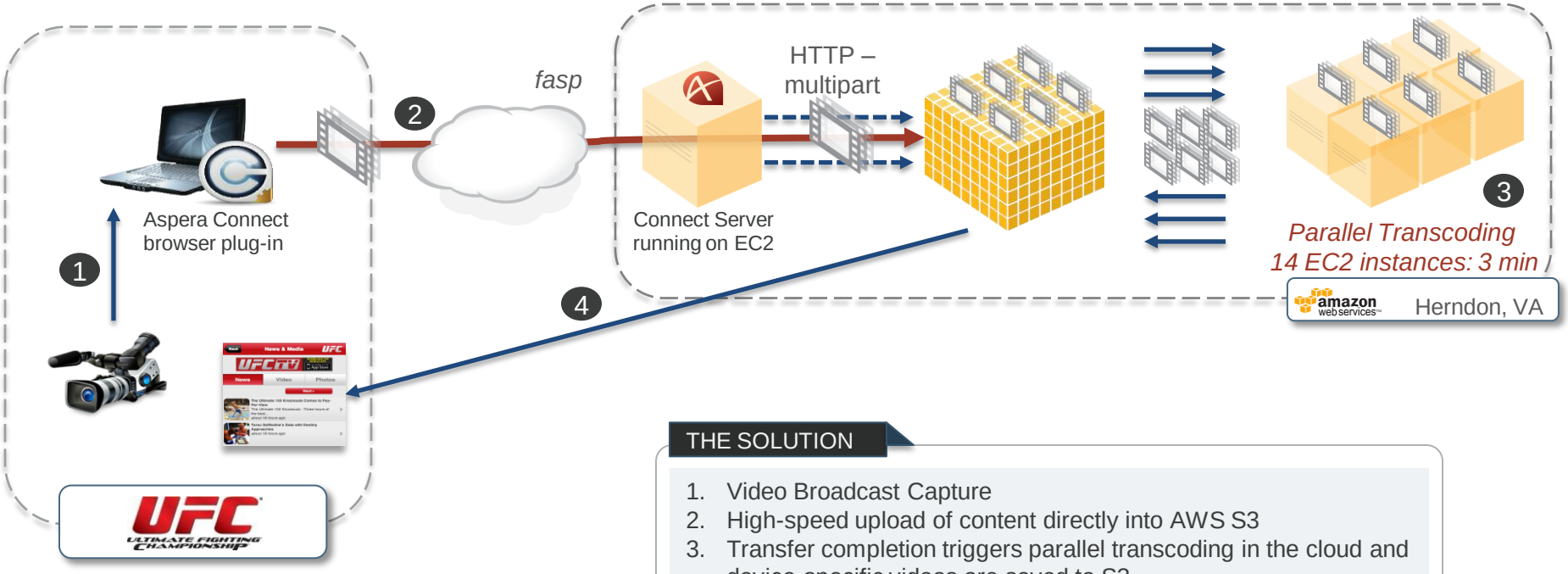


amazon web services
Windows Azure
openstack
Google
Akamai

Road Map
BT
CloudSigma
hp Cloud
rackspace the open cloud company
terremark

Performance
EFFECTIVE THROUGHPUT
up to 1Gbps
(per server Extra Large Instance)
10TB per 24 hours

ULTIMATE FIGHTING CHAMPIONSHIP (UFC)



THE SOLUTION

1. Video Broadcast Capture
2. High-speed upload of content directly into AWS S3
3. Transfer completion triggers parallel transcoding in the cloud and device-specific videos are saved to S3
4. Using AWS CloudFront, content is delivered to viewers' devices

FASP™ – PERFORMANCE BREAKTHROUGH

FTP	Across US	US – EU	US – ASIA	Satellite
1 GB	1 – 2 hrs	2 – 4 hrs	4 – 20 hrs	8 – 20 hrs
10 GB	15 – 20 hrs	20 – 40 hrs	Impractical	Impractical
100 GB	Impractical	Impractical	Impractical	Impractical

TCP transfer times limited by packet loss, delay (network distance) NOT BANDWIDTH

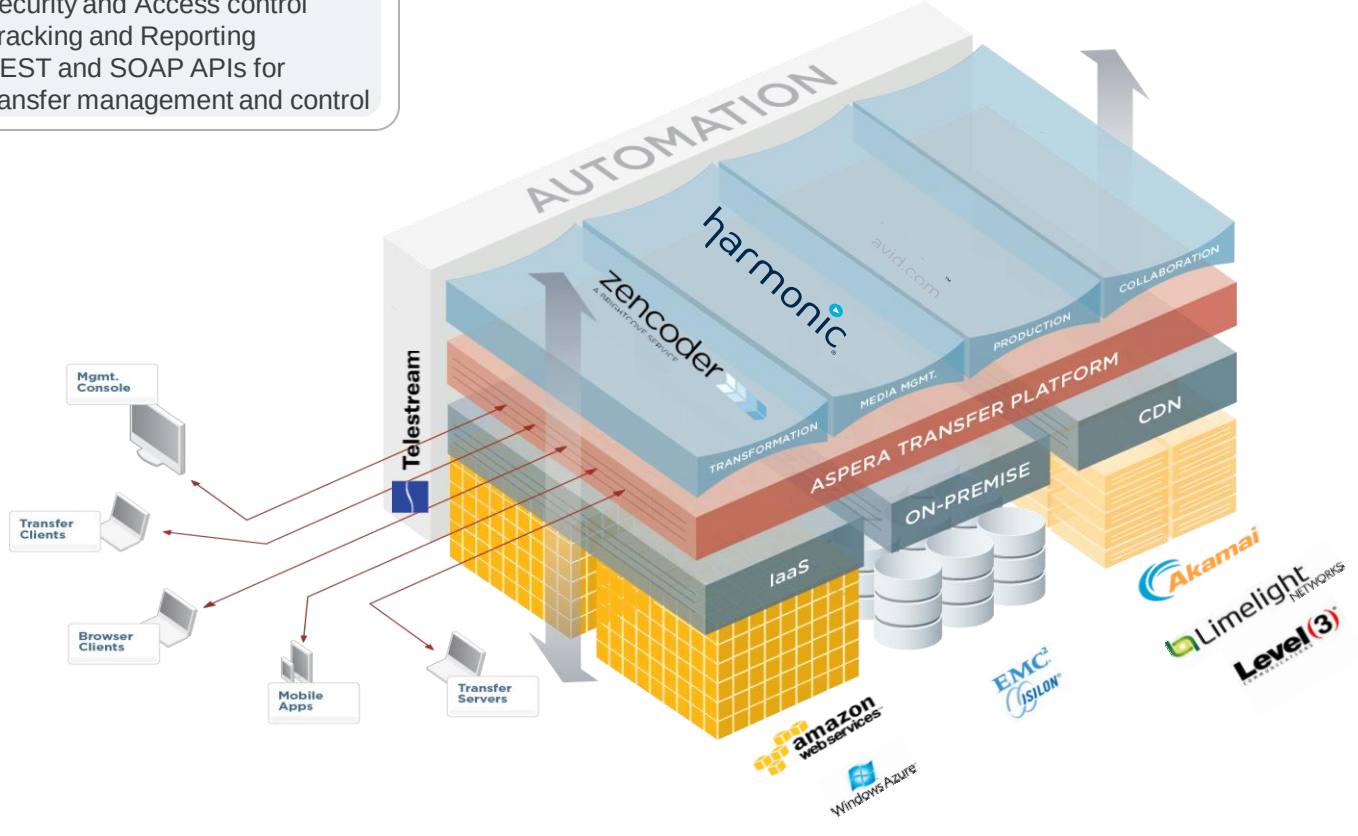
fasp™	2 Mbps	10 Mbps	45 Mbps	100 Mbps	200 Mbps	1 Gbps
1 GB	70 min.	14 min.	3.2 min.	1.4 min.	42 sec.	8.4 sec.
10 GB	11.7 hrs	140 min.	32 min.	14 min.	7 min.	1.4 min.
100 GB		23.3 hrs	5.3 hrs	2.3 hrs	1.2 hrs	14 min.

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%

ASPERA TRANSFER PLATFORM

ASPERA TRANSFER PLATFORM

- High-speed Transport
- Unified access to storage
- Security and Access control
- Tracking and Reporting
- REST and SOAP APIs for transfer management and control



ECOSYSTEM

Automation
- Aspera Orchestrator
- Telestream Vantage

Transformation
- Brightcove/Zencoder
- Elemental
- encoding.com
- Sony CI
- thePlatform
- Windows Azure

Media Management
- Harmonic
- Media Beacon
- Sony
- Vidispine

Production
- Avid
- EVS

Sharing / Collaboration
- Aspera Shares
- Aspera *faspex*

ASPERA TECHNOLOGY ADVANTAGES

Maximum speed

- Enables large data set transfers over any network at maximum speed, regardless of network conditions or distance
- Transfers large data sets of small files with the same efficiency as large single files

Distance Independence

- High-performance throughput regardless of location eliminates the tradeoffs between data location and access
- Unaffected by latency and robust to extreme packet lost

Complete security

- Includes complete, built-in security using open standard cryptography for user authentication, data encryption and data integrity verification

Robust, software only solution

- Uses standard, unmodified IP networking and is implemented in software as an application protocol
- Automatically resumes partial transfers and retries failed transfers

Flexible open architecture

- Supports interoperable file and directory transfers between all major operating systems and provides a complete, modern software API to build upon

ASPERA PRODUCT PORTFOLIO

TRANSFER CLIENTS

High-speed transfers
for web, desktop and mobile

WEB APPLICATIONS

File sharing, collaboration
and exchange applications

MANAGEMENT & AUTOMATION

Transfer management,
monitoring and automation

SYNCHRONIZATION

Scalable, multi-directional,
multi-node synchronization

TRANSFER SERVERS

High-speed file transfer servers for on premise, private, public, and hybrid cloud deployments

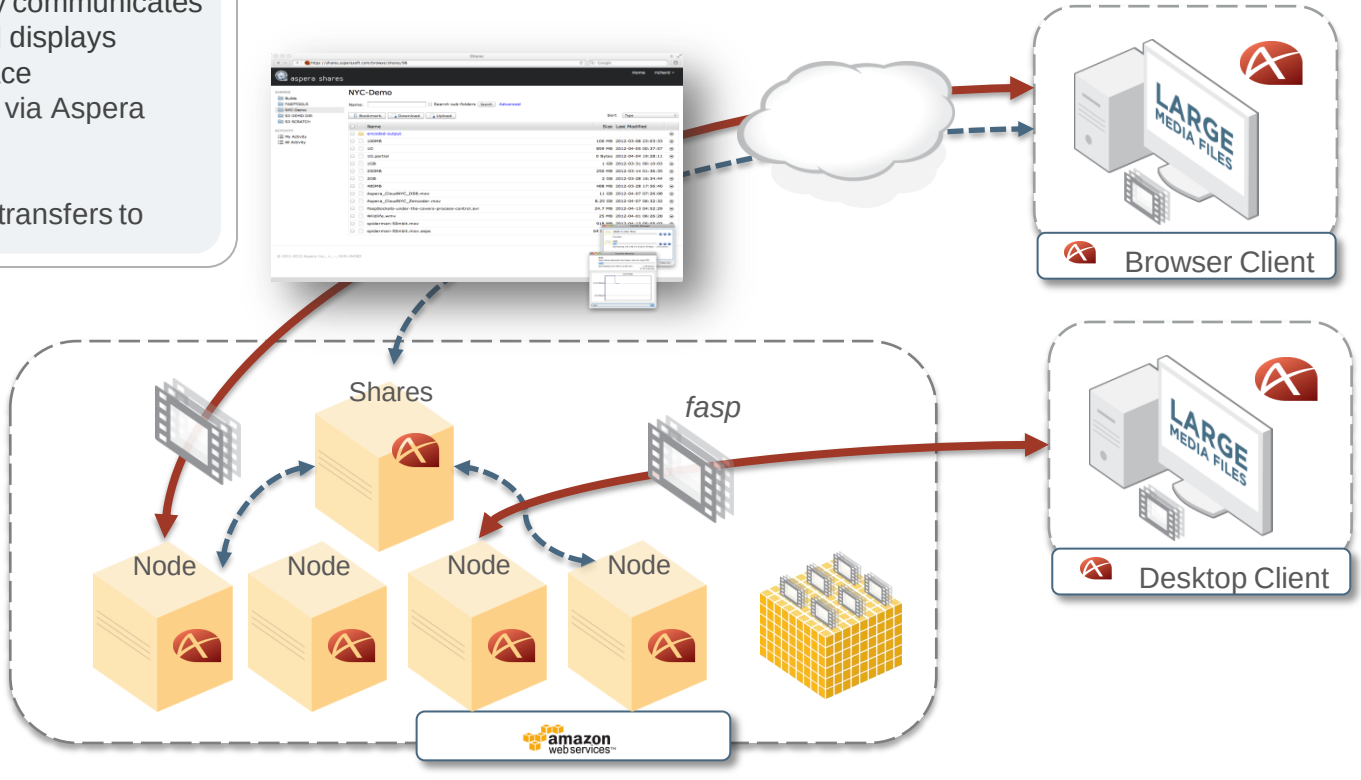
FASP™ TRANSPORT

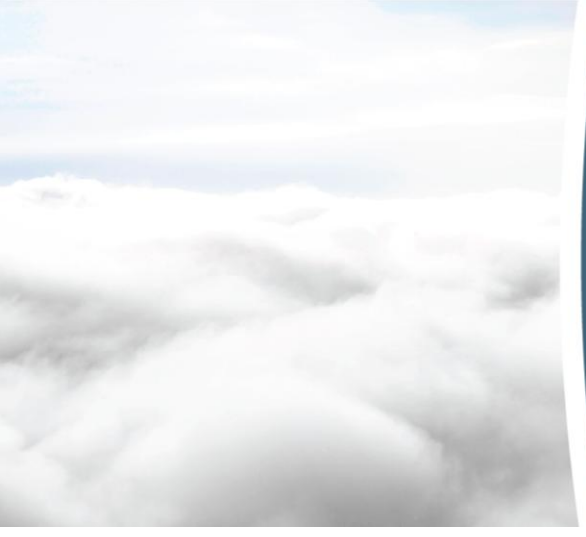
Innovative, patented, highly efficient bulk data transport technology, unique and core to all Aspera products

NETFLIX TRANSCODING IN THE CLOUD

THE SOLUTION

- Shares Web app transparently communicates with Aspera server Nodes and displays content in a single user interface
- Aspera Client uploads directly via Aspera Transfer Servers
- CLI transfers also supported
- Independent high-speed data transfers to AWS S3 transparent to user





THANK YOU

For more information on any Aspera product, please contact

sales@asperasoft.com