# IBM Aspera Streaming

Stream any size data or any bit rate video with near zero latency over the Internet

## Key benefits & capabilities

- Provides a uniform lossless, in-order byte stream transport over unmanaged IP networks
- Saves considerable costs by reducing or fully replacing expensive satellite delivery and dedicated fiber
- Delivers timely arrival of any live video source with error-free play out and near zero latency over any distance
- Enables bi-directional data and video streaming between endpoints
- Allows one stream source to be sent to multiple destinations concurrently
- Ensures all streams are securely authenticated and encrypted in transit
- Enables seamless integration of IBM Aspera Streaming capabilities using APIs and SDKs

IBM Aspera® Streaming was created from the ground up to revolutionize the way growing files and live video are transported. Data and video streaming over IP networks introduces a different set of challenges that are significant and distinct from the difficulties of transferring large closed files and data sets.

Today, organizations are increasingly leveraging new ways of using IP networks to stream rich data from one location to a another, often to a different region, country or continent. In these cases, there is either little means to store the data at the source or there is an urgency to transport it to a separate destination for processing or analysis as it is being generated rather than waiting for it to be written to disk and moved as closed files. There are many examples across industries, such as the transport of seismic drilling data from remote oil fields, autonomous driving sensor data for real time analysis, and high-resolution medical imaging used to make critical lifesaving diagnoses remotely. Many of these use cases require the data to be transmitted with extraordinary urgency, reliability and security.

In the media industry specifically, broadcast video transport over long distances (ingest and backhaul, pitch and distribution) has traditionally relied on expensive linear satellite or proprietary network systems. However, satellite transport has significant limitations for today's video demands, where video is produced anywhere and everywhere, and consumer appetite for live and interactive second-screen video is explosive. For example:

- Satellite uplinks are often not available on demand, requiring large investment of capital or pre-planning that is impractical for ad hoc events and today's on-location programming and news.
- The linear feed format limits rapid turnaround and customization demands in file-based production.
- Satellite transmission is difficult to integrate with modern file-based production and cloud computing environments for transcoding and distribution, and can be disproportionately expensive for long tail content on the Internet.
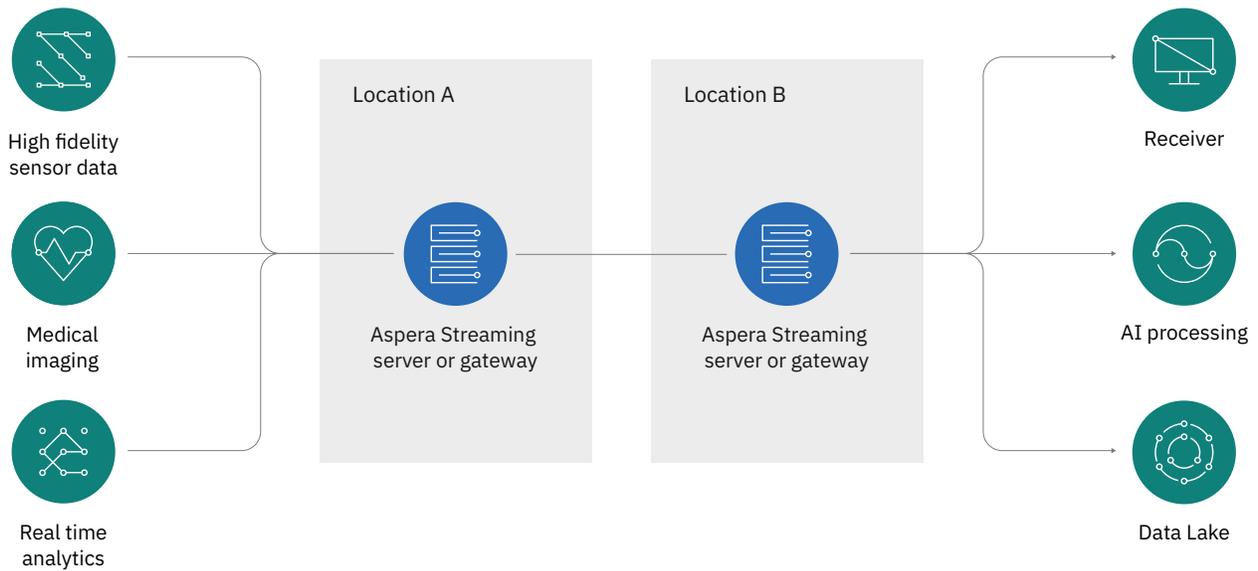
Figure 1. Multiple examples of data streaming sources and destinations using Aspera streaming

Today's data streaming and live video opportunities demand new transport solutions using Internet (IP) networks in place of legacy delivery options. As a result, various kinds of technologies and services have been introduced over the past several years that have attempted to reliably stream data and video over the Internet such as services that use forward error correction over UDP and peer-to-peer distribution.

However, these technologies that are primarily used in the media industry, have not been able to provide the consistent exceptional quality and "zero-delay" transport experience provided by traditional satellite backhaul and transmission: Neither FEC over UDP nor peer-to-peer networks are able to guarantee live transmission rates over commodity Internet with variable round trip time and packet loss, and unlimited data rates.

- FEC over UDP methods introduce significant delays from live sources in order to protect against Internet packet drops; the greater the protection provided, the greater the delay.

- Peer to peer distribution networks and CDNs are constrained to locate "ideal routing paths" to minimize stream startup delay and glitching. This limits their practical function because only certain peer paths will work well enough. This

in turn can lead to high costs where content has to be transported to "nearby" CDN points for ingest or served from "nearby" edge locations to ensure good quality.

Aspera's streaming technology is a breakthrough alternative for Internet transport because the efficiency of the underlying protocol is able to guarantee timely arrival of live video and data independent of network round-trip delay and packet loss. It does so with negligible startup delay/pre- buffering. At the core of the software is the patented  IBM Aspera FASP® transfer protocol, which is widely used and proven for high-speed long distance file transfer. This new streaming architecture enables in-order byte stream delivery of high-fidelity data as well as live broadcast video feeds.
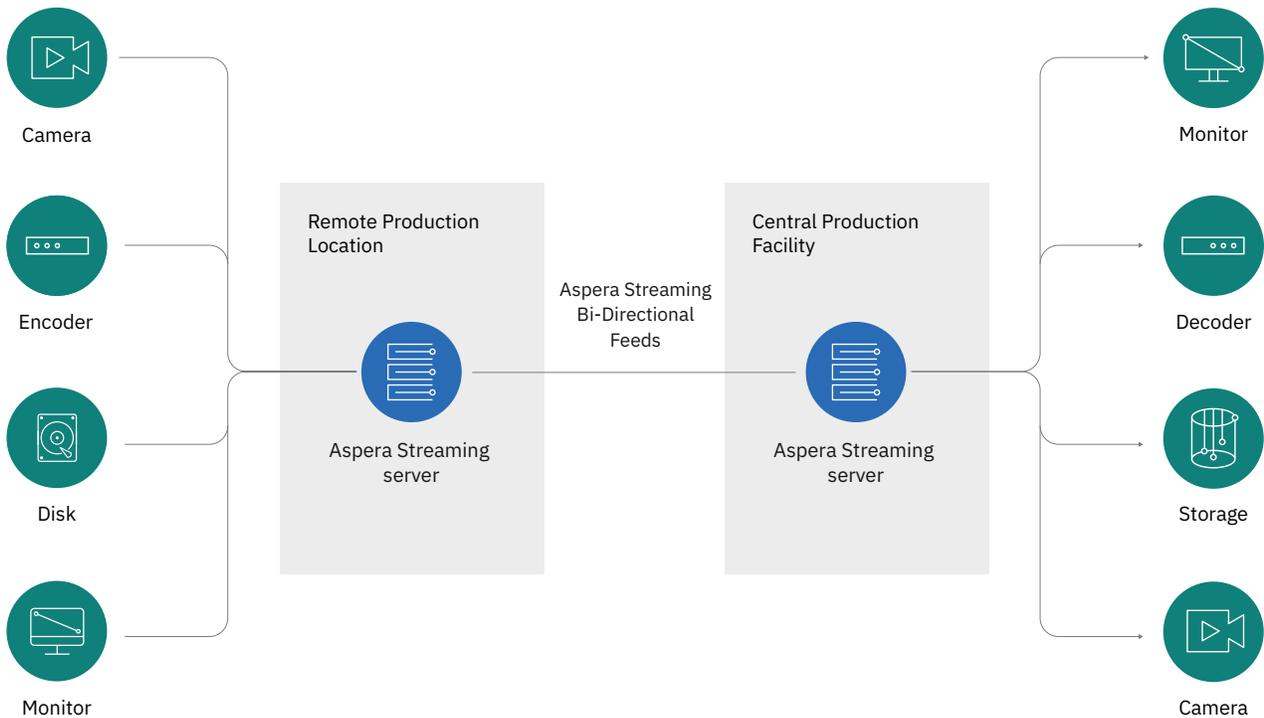
Figure 2. Remote video broadcast multi-capture and delivery with return path

## Features and benefits

### Interoperability

- Transport any growing file sources or live video source available on local multicast, unicast TCP/UDP, and output it to the same
- Provides a uniform lossless, in-order byte stream transport that equally supports constant and adaptive bit rate formats with performance independent of video encoding or network conditions

### Enables High-performance Data Streaming

- Integrates quickly, transparently and easily with existing TCP workflows
- Bidirectional and multi-session support for data streaming

### Quality Video Delivery

- Error-free play delivery with near zero latency at any distance
- Less than 2 seconds of delay from live for 50 Mbps video sources over global Internet networks with round-trip delays of 200 milliseconds and 2% packet loss

### Reliability and Multi-endpoint capability

- One stream source can be sent to multiple destinations concurrently and provides built-in path redundancy

- Server hosts are natively clustered; stream sessions failover automatically to another host

### Built-in Security

- All streams are encrypted in transit and security authenticated using standard public/private key authentication or Aspera's multi-tenant access key system
- Built in access control policies can be used to restrict stream providers and consumers by stream protocol, IP address, and ports

### Interoperability and Management

- Streaming sessions are designed for full interoperability with the Aspera file transfer platform including writing to on-premises or cloud based "object" storage
- RESTful APIs allow production workflow and broadcast management systems to manage streams and provide status
- Stream sources can include cloud and on-premises transcoders / encoders that read from stream and file, and provide stream outputs or growing files
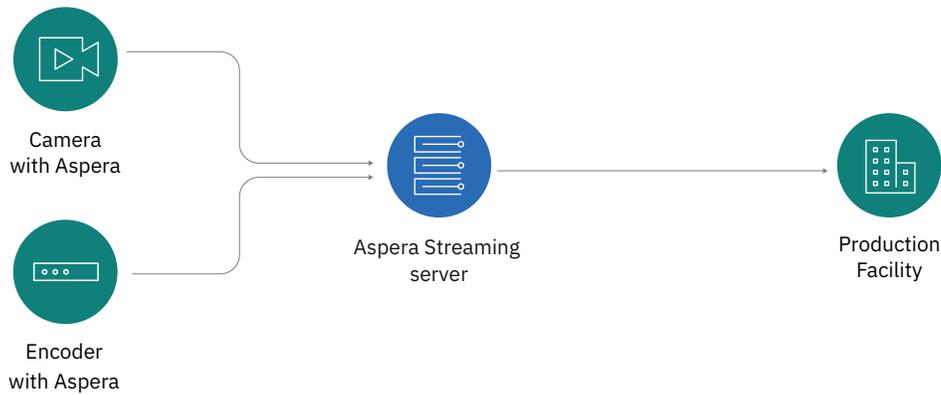
Figure 3. Embedded video capture with delivery over the Internet

# Data Streaming Use Cases

### Log File Aggregation

- Application logs
- Security and networks logs

### Remote Data and Image Capture

- Medical imaging (MRI, CT scans)
- Drone and surveillance data
- Security and networks logs

### Internet of Things (IOT) and Edge Computing

- Connected car sensor data
- Commercial device sensors

### Storage and Analytics

- Database replication
- Cloud analytics

### M&A and Legal eDiscovery Collaboration

- Real-time data transfer integrated in custom web applications and content management systems

# Video Streaming Use Cases

### Transport

- Satellite and dedicated fiber replacement
- Dedicated network (e.g. MPLS) replacement

### Remote Broadcast Capture and Playout

- Simple playout (remote to broadcast facility).
- Multi-site playout
- Complex playout (with inline transcoding/processing, multi-site)

### Contribution

- Electronic News Gathering (ENG)
- Complementary Broadcast Content (additional content within live broadcast, second screen, digital experience)

### Live Events

- Sports and entertainment (concerts, music festivals, award shows, etc.)
- Internal corporate communications and  training
- Marketing (product launches, events)
- Conferences and keynote presentations

### Delivery and Distribution

- OTT and VOD
- Affiliates
- CDN'S

IBM Aspera Streaming is available as both a software application (Linux, Windows, Mac) and as an embedded solution that can be integrated into other applications or numerous devices. Perpetual and term licenses are both available. Pricing is based on bandwidth with speeds starting at 45Mbps. Business Partners and developers may also be interested in the IBM Aspera Developer Network for access to API documentation, SDKs, code samples and much more.

## About IBM Aspera

IBM Aspera offers 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, Emmy® award-winning 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.

## For more information

For more information on IBM Aspera solutions, please visit ibm.com/products/aspera or contact aspera-sales@ibm.com.