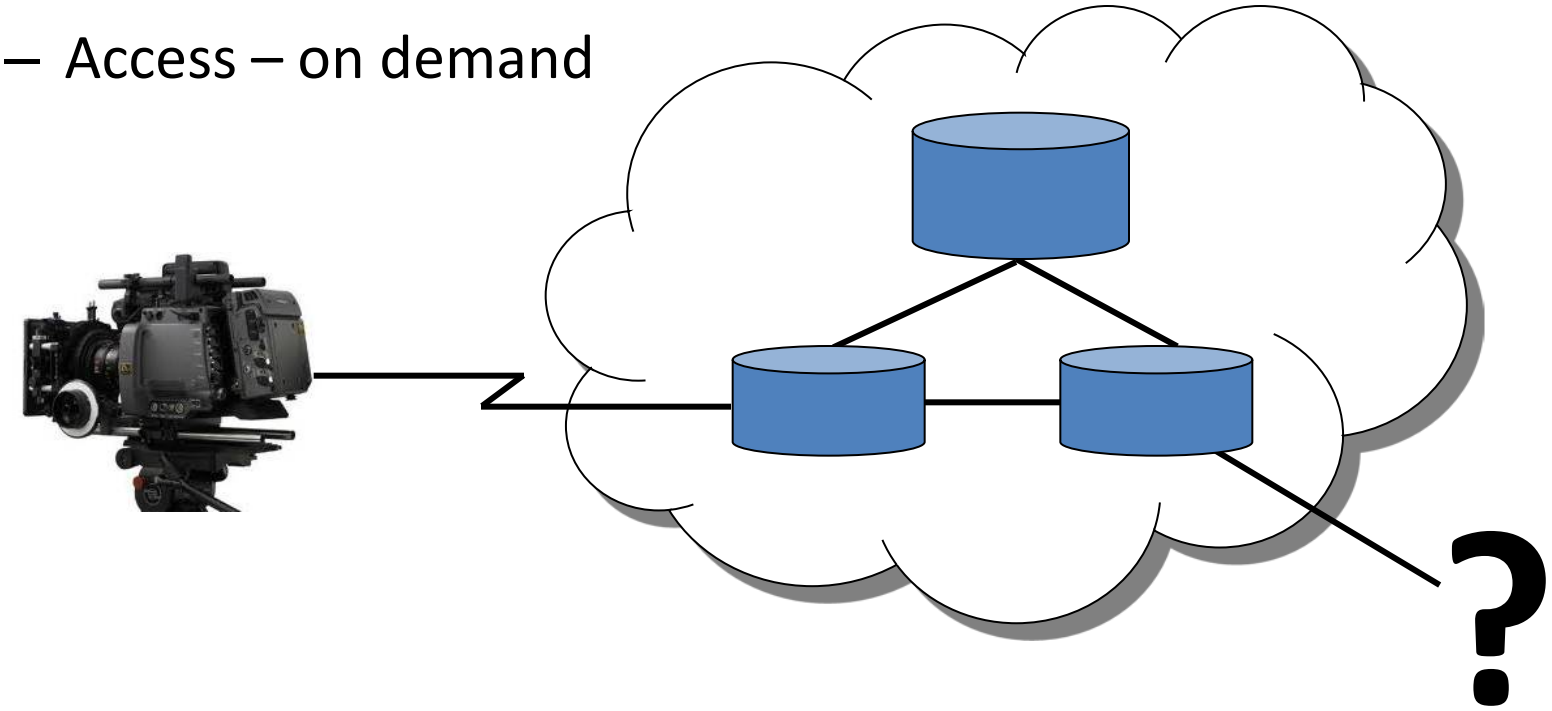
GOVERNMENT VIDEO IN THE CLOUD

Lessons from Hollywood

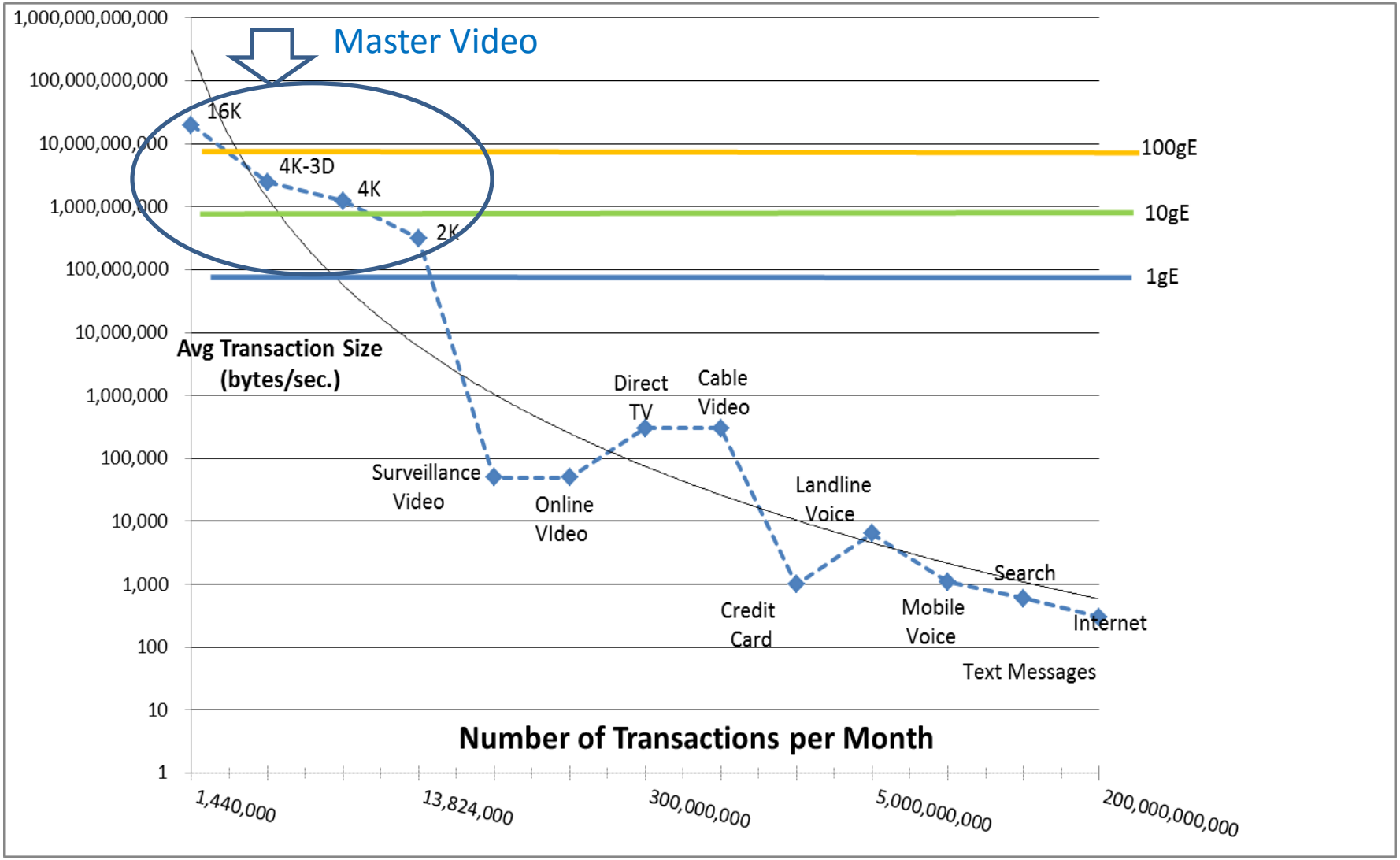
DCIA Conference at PMC@GVE
December 4, 2013

High-Resolution Images Pose Challenges

- Images are large and growing fast
- Users store everything, hold for selective review
- Users want to leverage the benefits of the cloud
  - Economics - elastic
  - Access – on demand



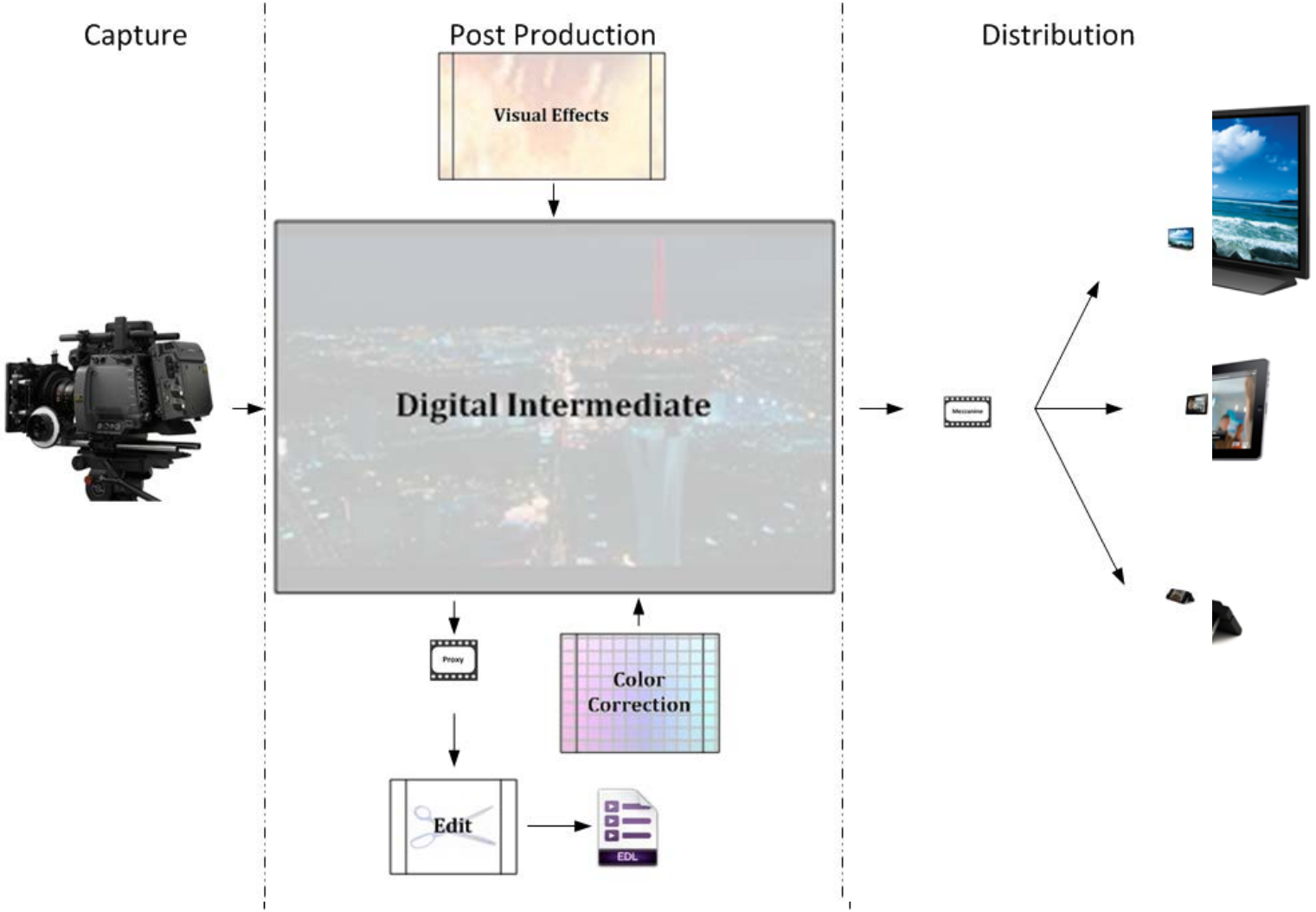
Imaging is Emerging as Big Data



Growth of Imaging Data in Hollywood

- Storage/Transmission Requirements are Exploding
  - Move from 2K to 4K Resolution Quadruples Data
  - High Frame Rate Doubles or Triples Data
  - 3D Doubles Data

Work/Data Flows in Hollywood

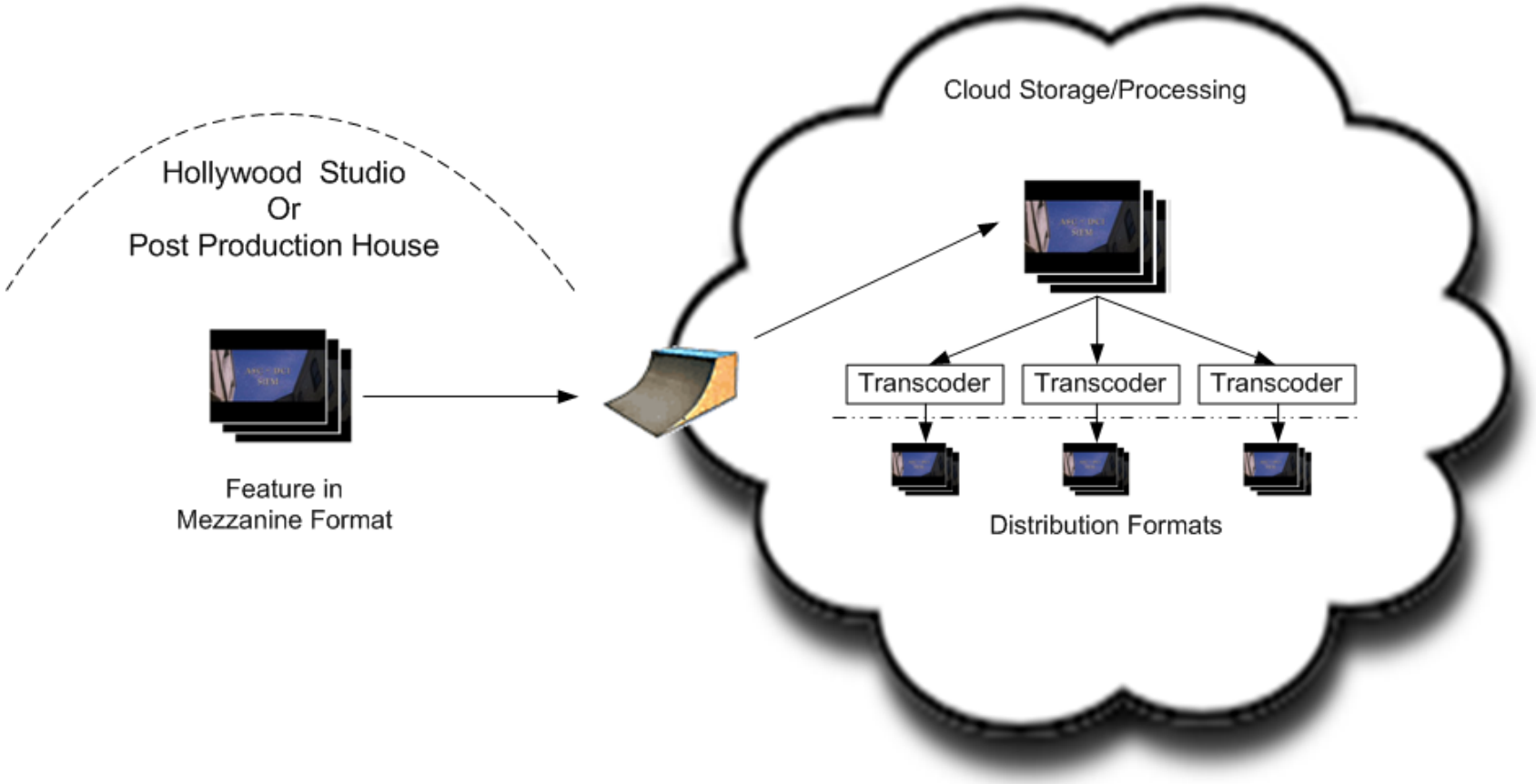


Lossy Compression for Media Distribution

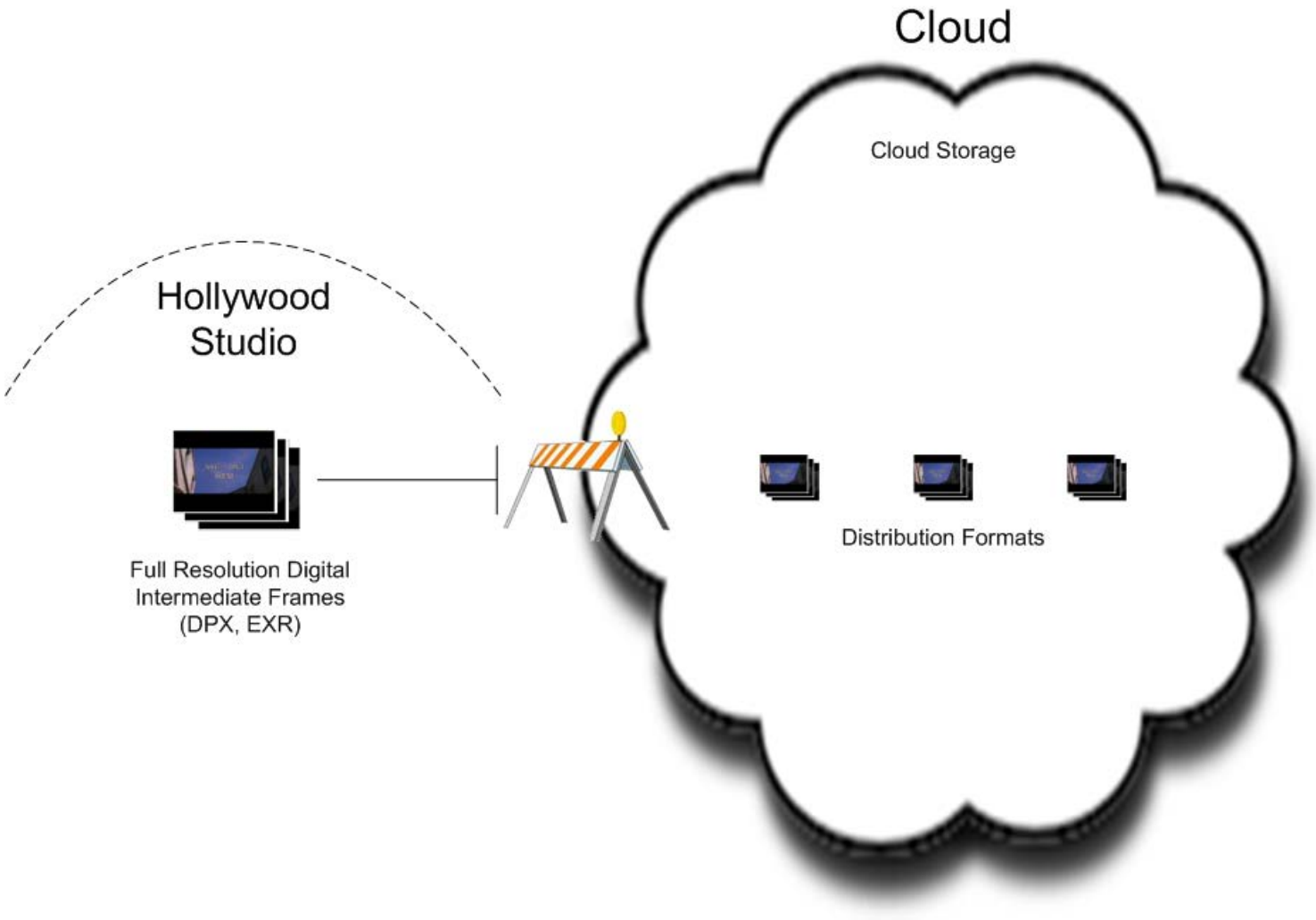
- Master/Frame
  - HD: 8 MB
  - 2K: 12 MB
  - 4K: 52 MB
- Transcode
  - MPEG 4: 20 KB
  - H.264: 10 KB
  - HEVC: 5 KB?

Cloud transcoding with standard compute instances

Cloud-Based Distribution – Lossy Compression



High-Resolution Image Obstacle



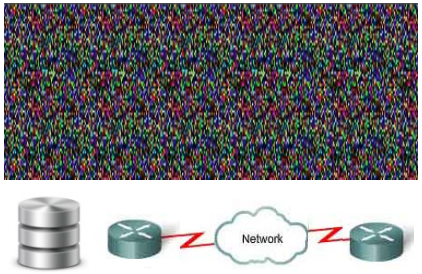
Bit-Exact Compression

- Ease the on-ramp to the cloud
- Reduce the cost of most expensive cloud components
  - **Storage**
  - **Bandwidth**
- Multi-processing with multiple, standard inexpensive compute instances

Bit Exact Compression at Speed

Original Image File

Compressed File

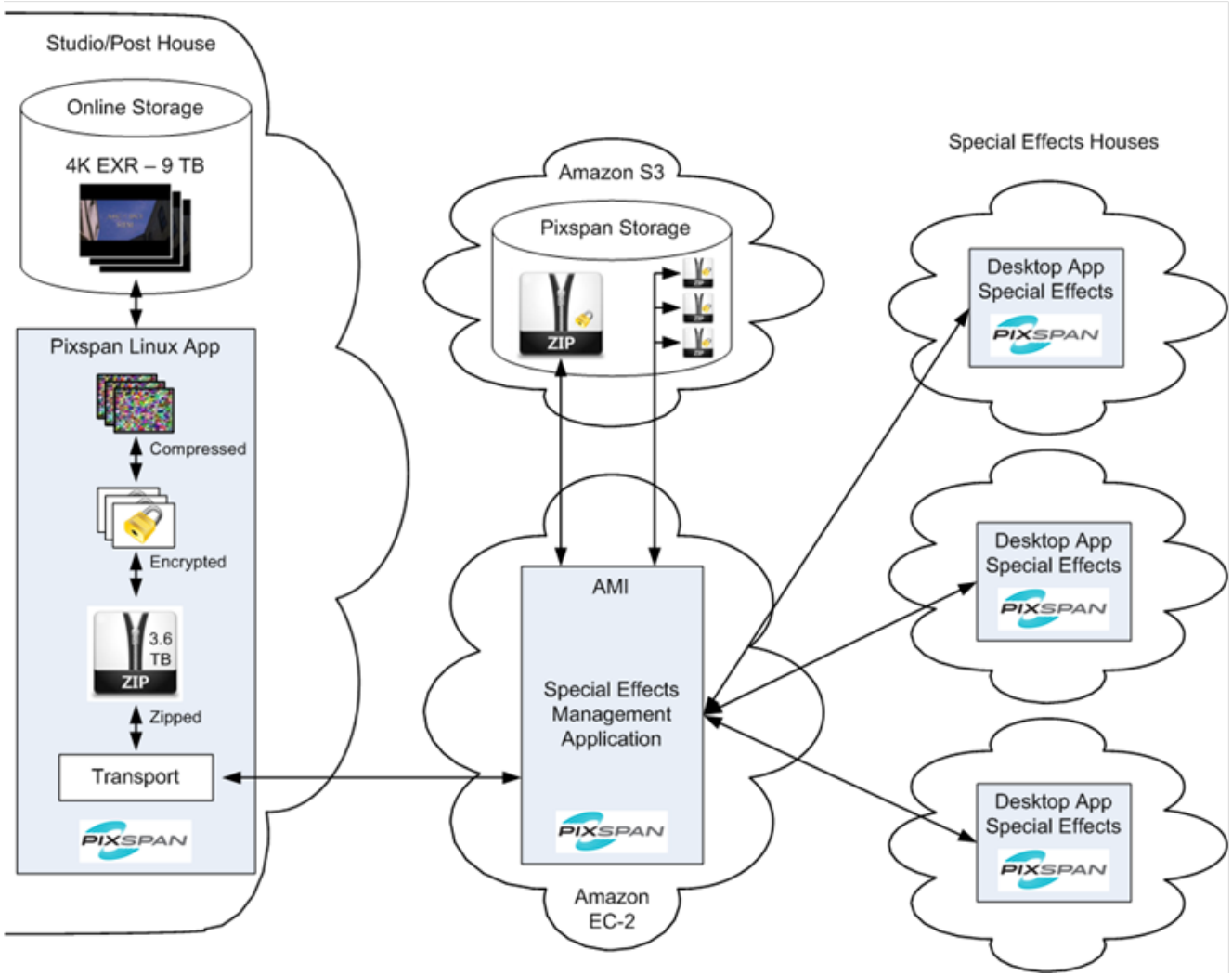


Decompressed File

Bit Exact

Typical ROI is 5 to 10:1 within months

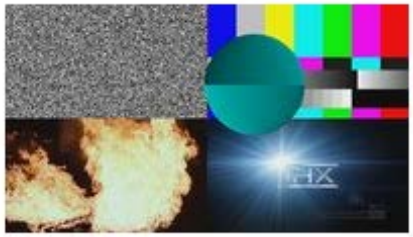
Example for Special Effects Collaboration



Pixspan ZIP Savings ~66% vs. Original

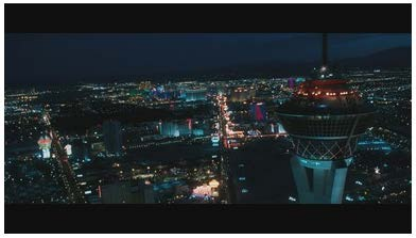
(File sizes shown in bytes)

Original:	8,296,448	Original:	50,989,056	Original:	12,107,624	Original:	5,537,792
ZIP:	4,569,626	ZIP:	26,111,299	ZIP:	5,647,894	ZIP:	5,248,187
Pixspan:	2,520,357	Pixspan:	13,430,787	Pixspan:	2,315,277	Pixspan:	2,488,212
Savings:	70%	Savings:	74%	Savings:	81%	Savings:	55%





Original:	5,537,792	Original:	5,537,792	Original:	5,537,792	Original:	13,147,136
ZIP:	3,481,358	ZIP:	3,704,098	ZIP:	4,414,698	ZIP:	12,158,114
Pixspan:	2,191,200	Pixspan:	1,811,497	Pixspan:	2,764,877	Pixspan:	8,511,054
Savings:	60%	Savings:	67%	Savings:	50%	Savings:	35%




Bit-Exact Pixspan Coverage

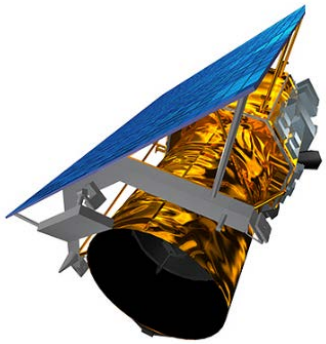
- Major image file formats, across multiple industries:

Media/Post Production

OpenEXR
DPX
CINEON
TIFF
ARRIRaw

Medical Imaging

DICOM
TIFF



Surveillance

Raw
GeoTIFF
LiDAR

Prosumer

TIFF

Summary

- Video/Images are Big Data
- Public and private clouds facilitate collaboration and distribution
- On-ramp is a barrier
- Software can reduce cost/increase speed, with elastic computing

Future – Key Trends

- **SDN** – Flexible bandwidth facilitates large transfers, especially in the cloud
- **NFV** – Content-aware networks can deploy temporary, virtual solutions