10 Thousand Channels to 10 Million Viewers: Scaling Video Delivery over IP
Neill A. Kipp
Distinguished Engineer
Linear Transcoder

- single profile H.262
- multiple profile H.264

- Transcode to MPEG-4

Multicast
Package into DASH with Pillar LP

Encoder Boundary Point (EBP)

7 x 188 byte packets per UDP

13,445 Pillars running on 1443 hosts

DASH MPD
TS

RAM disk

time shift buffer

Package into DASH with Pillar LP
Distributed HTTP Access

geographically distributed edge cache clusters

DNS  Content Router  HTTP

manifest hostname and path

hostname to resolve

numeric address of router

manifest path

302 redirect

to selected server in closest, least-loaded cluster

cache miss to mid tier

health reports

Distributed HTTP Access
Super8 JITP

40 Super8 instances for national linear

Super8 JITP
NO STRIKE OUT DEALS!

Dealin' Doug
Kubernetes master

- etcd
- launch
- schedule
- monitor
- rebalance

Kubernetes nodes

Virtualization, Orchestration, One-click Deploy

IP traffic
MemSQL

real-time analytics

Storm

+ metadata

HTTP Collector

playback metrics

VIPER Player Platform

1 min heartbeat

Hunk

history path

Hadoop

2 years
3.5 PB

Headwaters

Kafka

Comcast API

Big Data
13,445 linear channels
13,445 Pillars – 1443 VMs – 40 data centers

426 Super8 instances
40 data centers

72 mid-tier nodes
36 TB ram disk
20 PB spinning

550 edge nodes
138 TB ram disk
6 PB spinning

6.3 Tbps capacity
15 billion transactions, 5 PB per day
10 million viewers