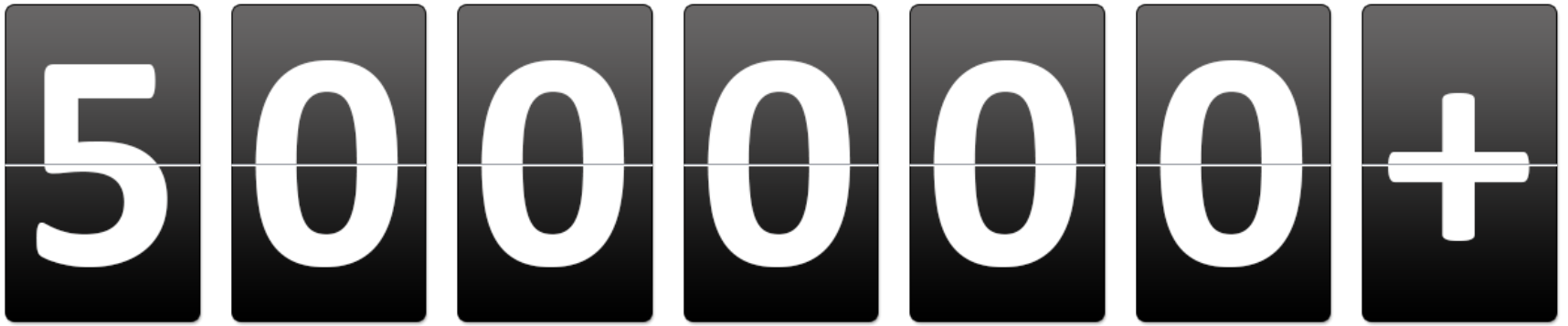
Cloud Contribution

Who Drove #43?

NASCAR **LIBRARY**

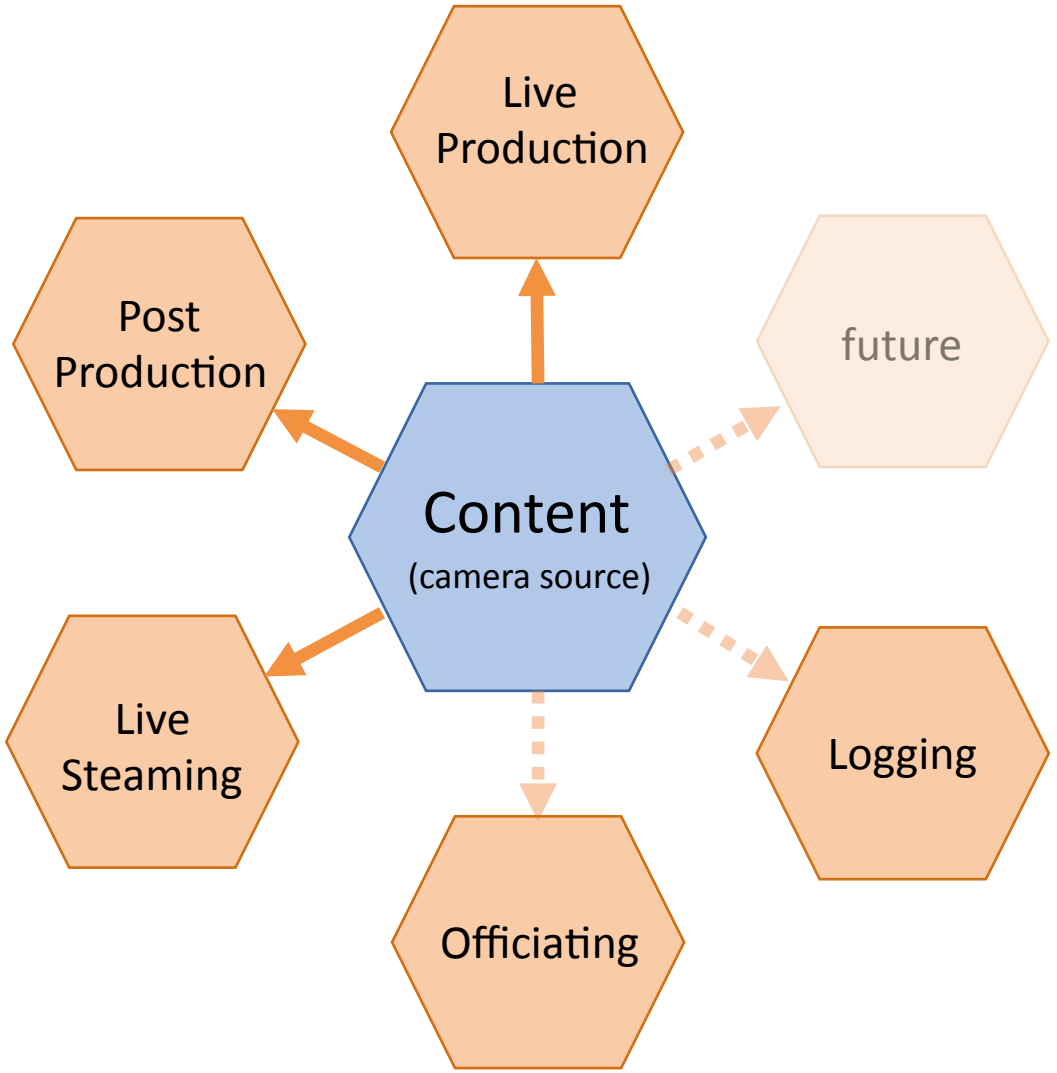


- 300 hours a week of new content
- 1% of new footage is used the week acquired

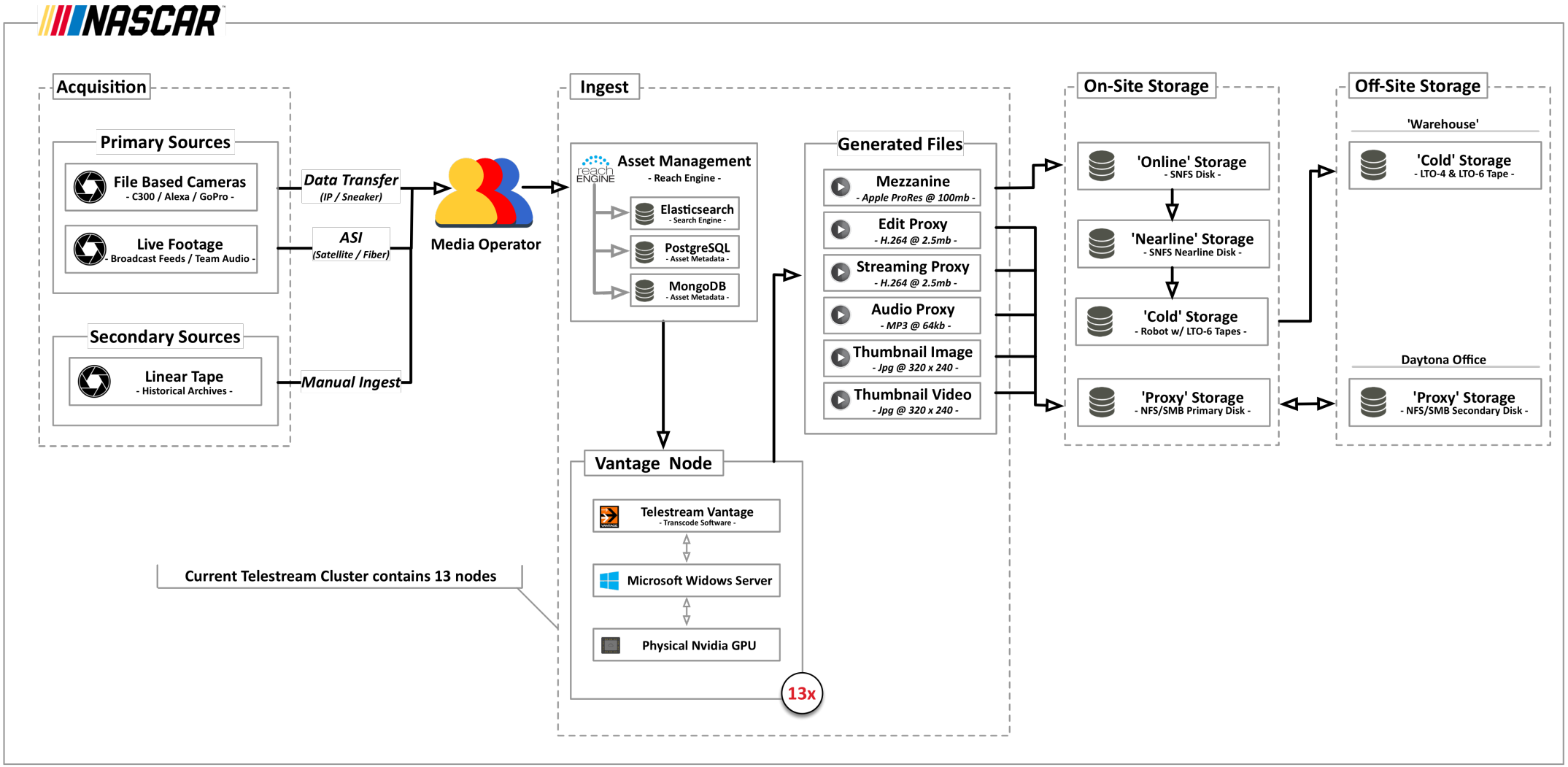
*For purposes of this presentation we are only discussing video. Should we include audio, our archive would surpass 760,000 hours of content

Should we move our entire library to the Cloud?

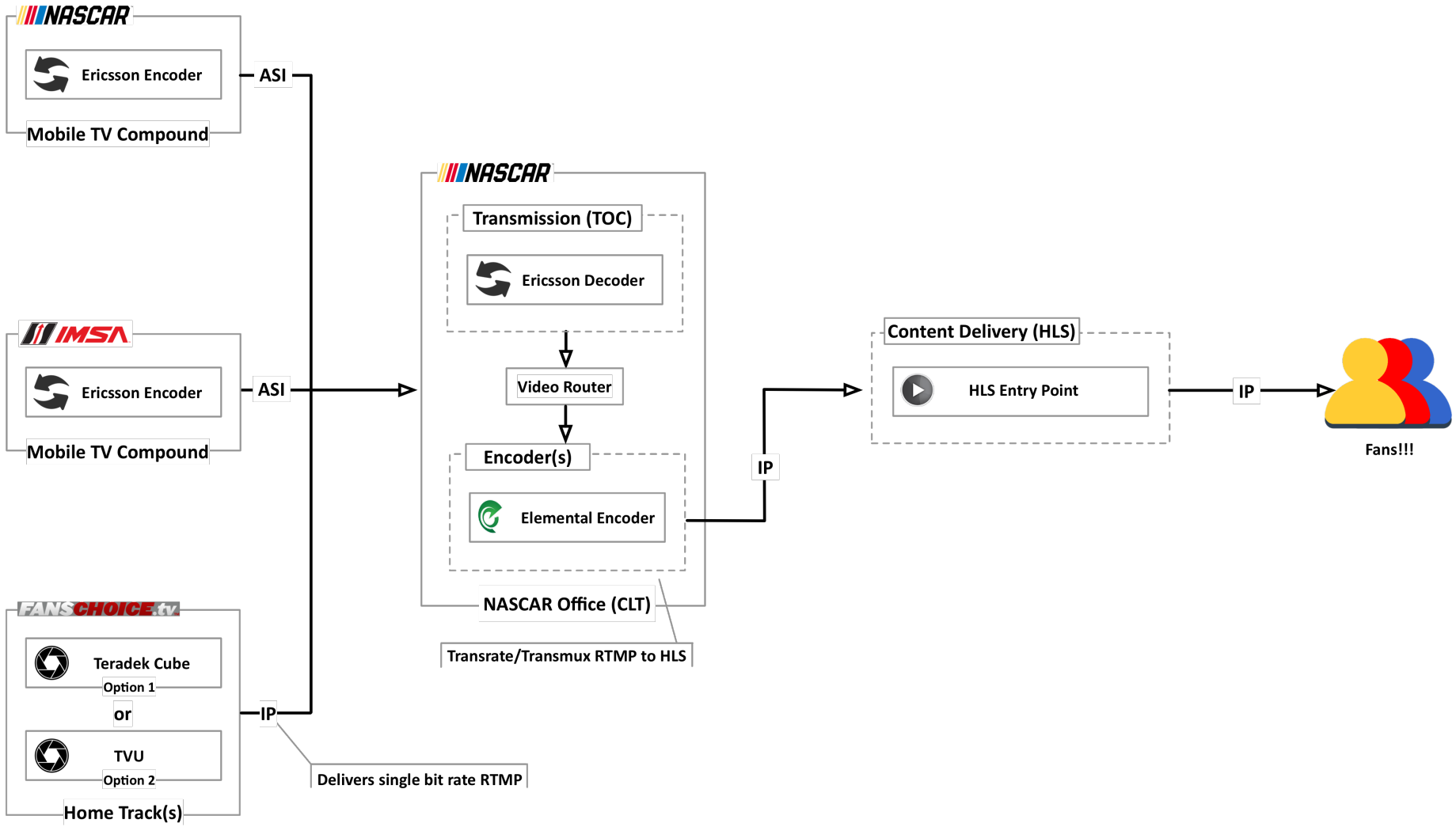
Where Do We Use Our Content?



Current High Level Workflow - Library

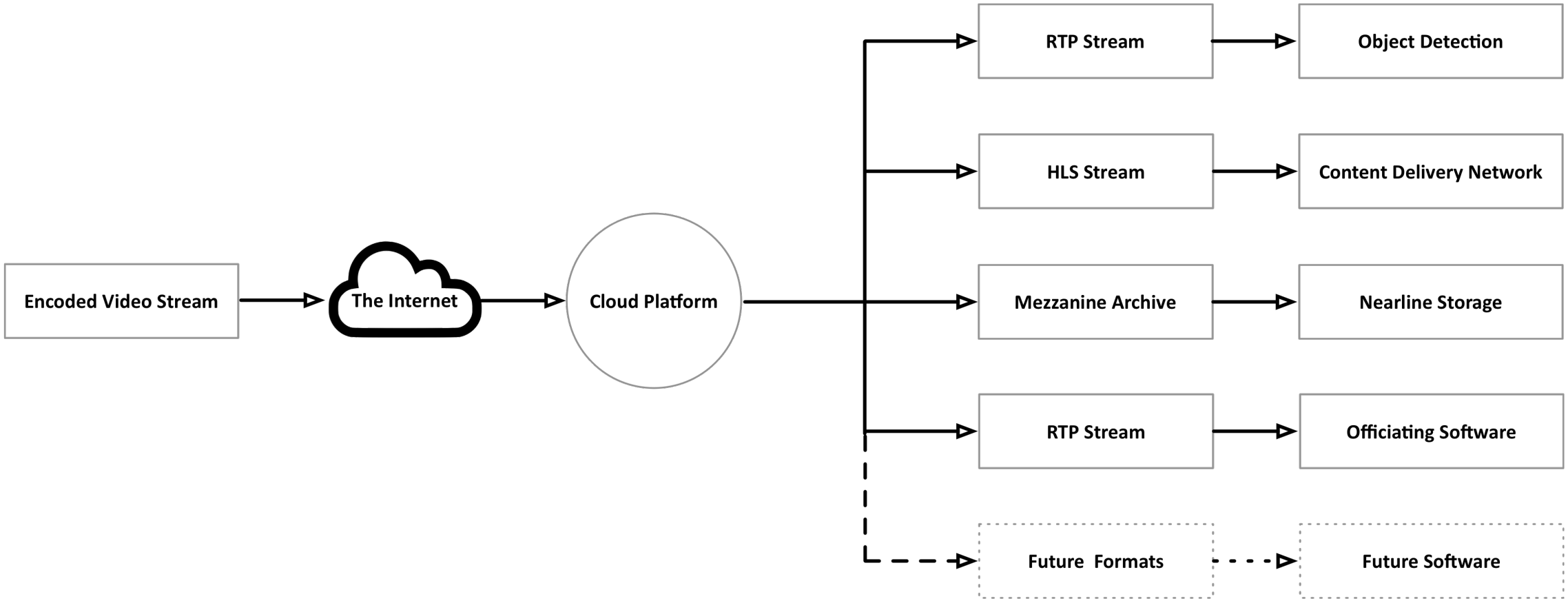


Current High Level Workflow - Streaming

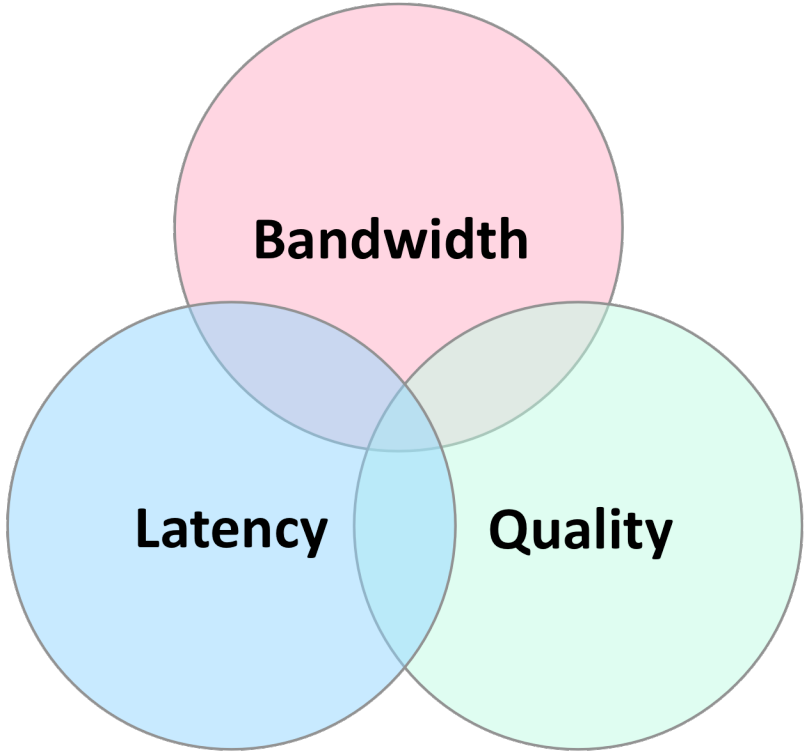


Can we be more efficient?

Cloud Contribution - High Level Workflow

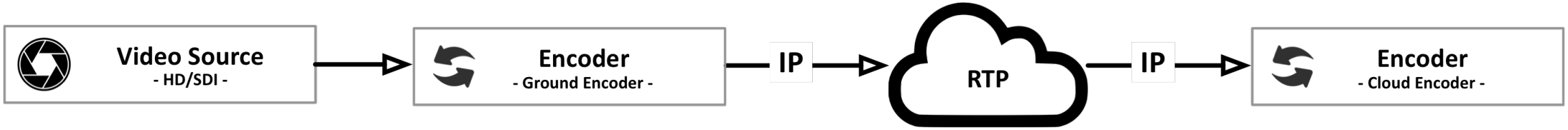


Cloud Contribution – The Constraints



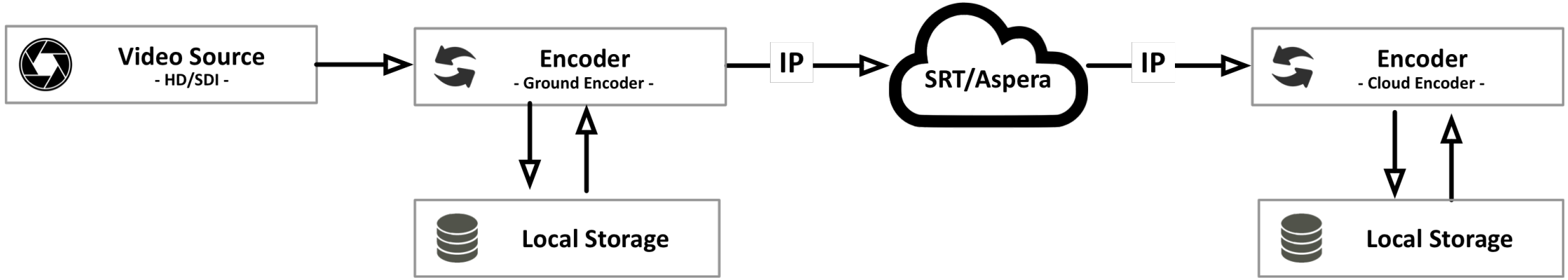
How it works – Option 1

- Encode as HEVC
- Deliver as RTP



How it works – Option 2

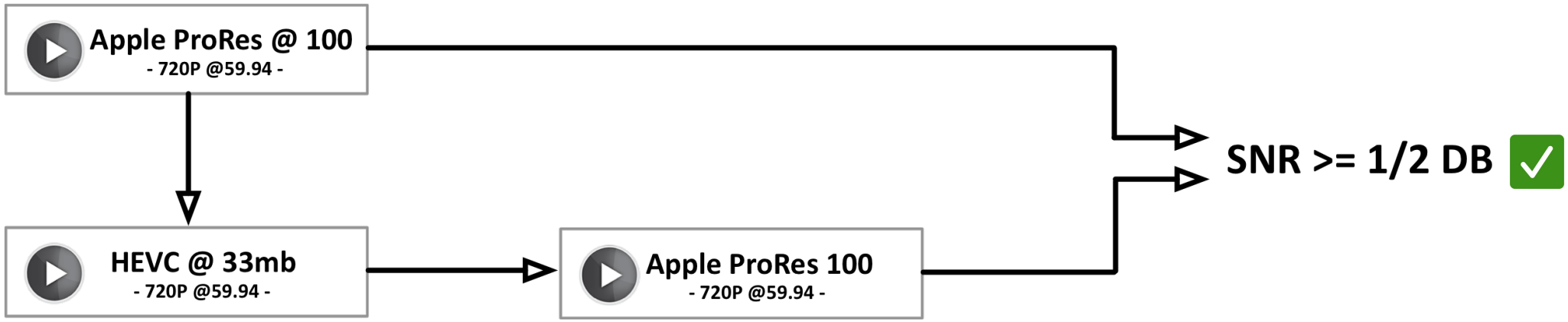
- Encode as HEVC
- Deliver as TIFO



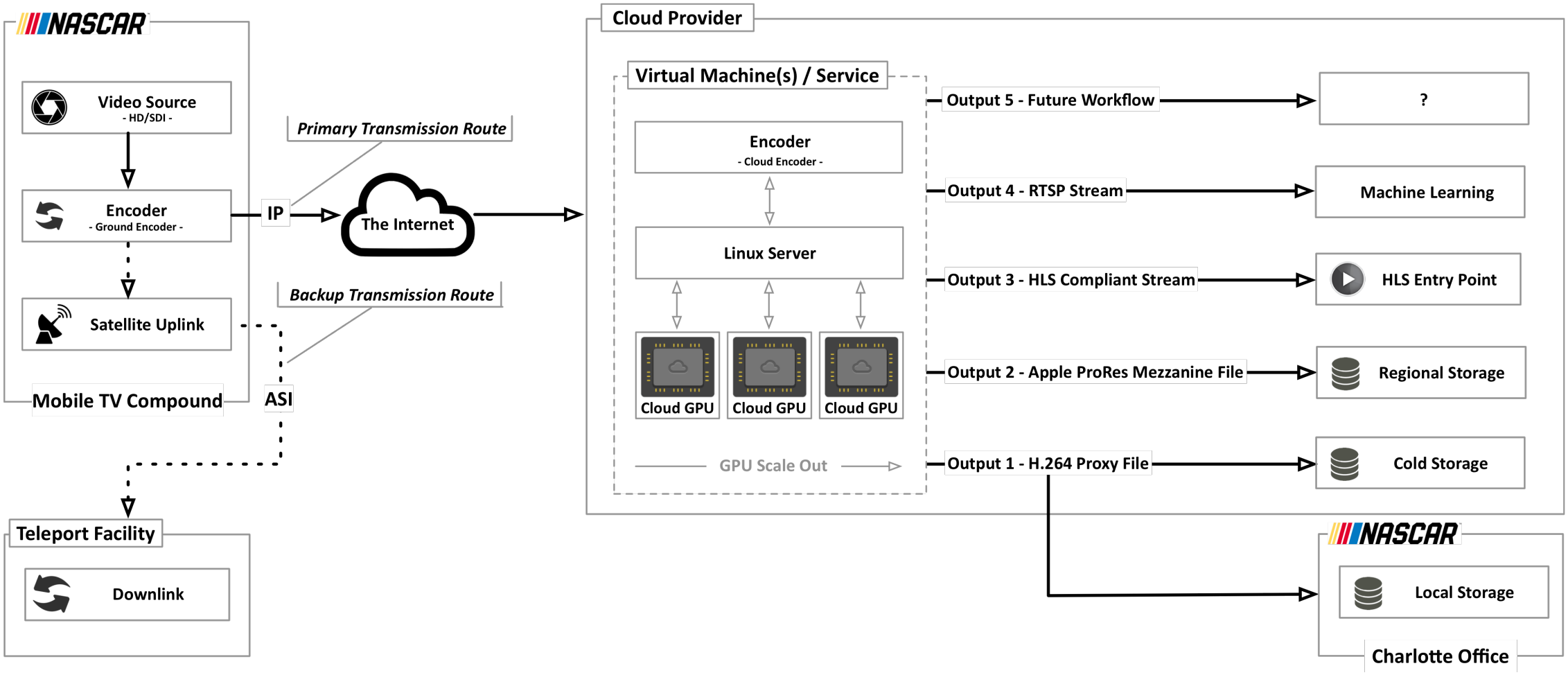
Quality - Signal To Noise Ratio

$$SNR = \frac{P_{signal}}{P_{noise}}$$

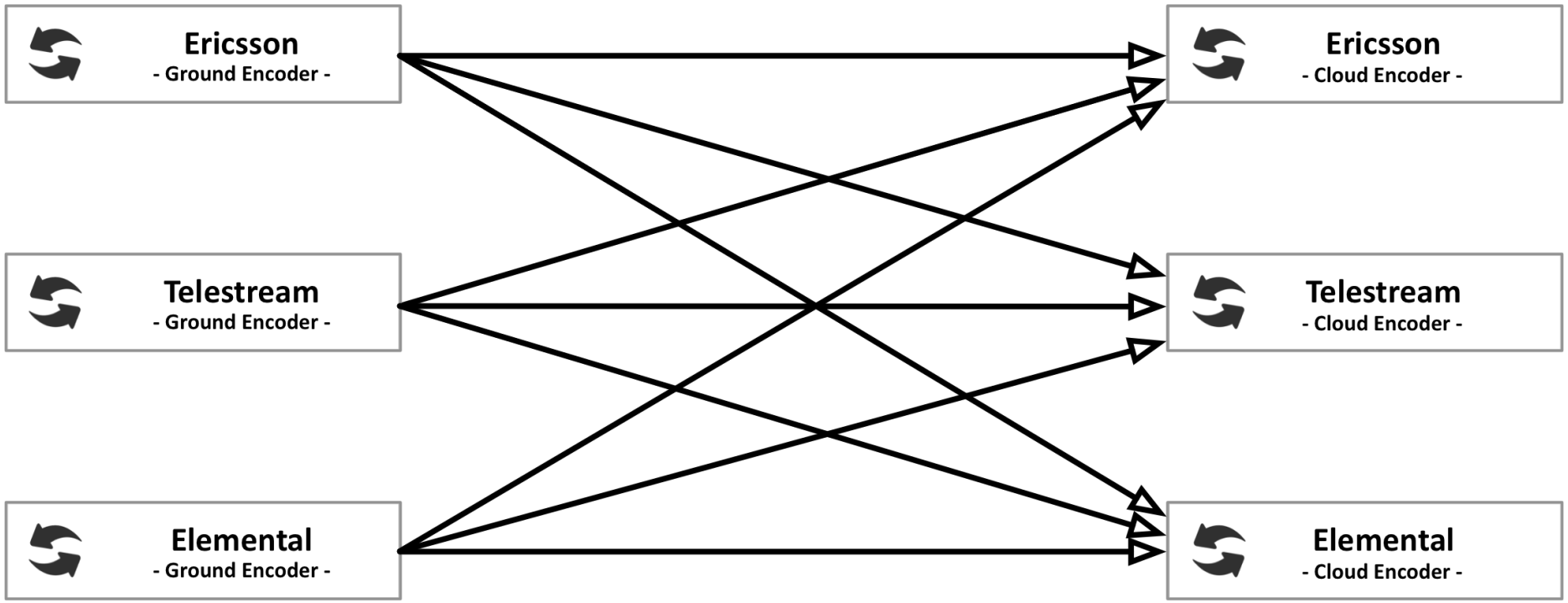
Quality - Signal To Noise Ratio



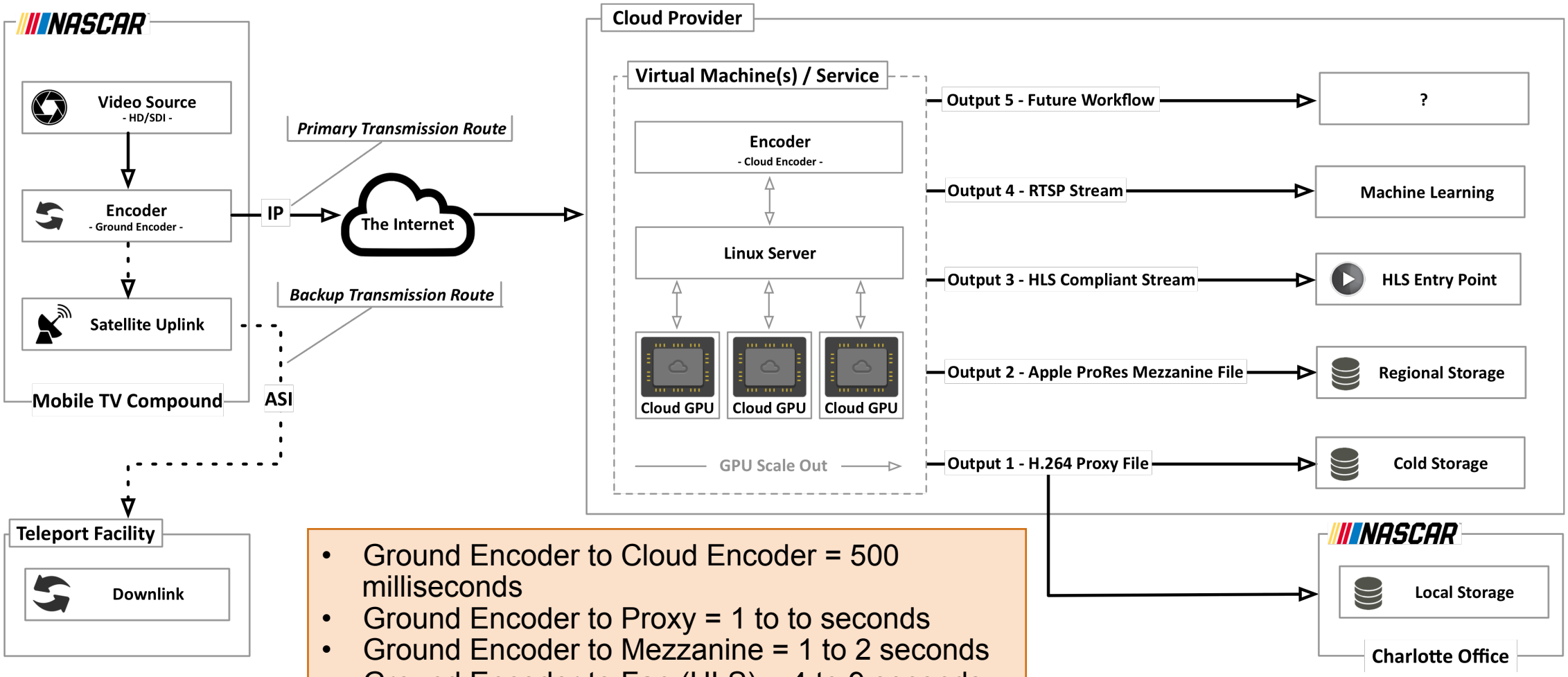
Detailed Workflow



Open Architecture



Detailed Workflow – Delivery Times



- Ground Encoder to Cloud Encoder = 500 milliseconds
- Ground Encoder to Proxy = 1 to to seconds
- Ground Encoder to Mezzanine = 1 to 2 seconds
- Ground Encoder to Fan (HLS) = 4 to 9 seconds
- Ground Encoder to ML = < 1 second

Advantages of Cloud Contribution

- More efficient use of bandwidth from event (track)
- Trigger multiple workflows from one source
  - Reduce staff ?
  - Reduce ability for mistakes ?
- Reduce CapEx
- Allow future workflows/deliverables by harnessing the Cloud

Questions?