

# Per-Title Encoding



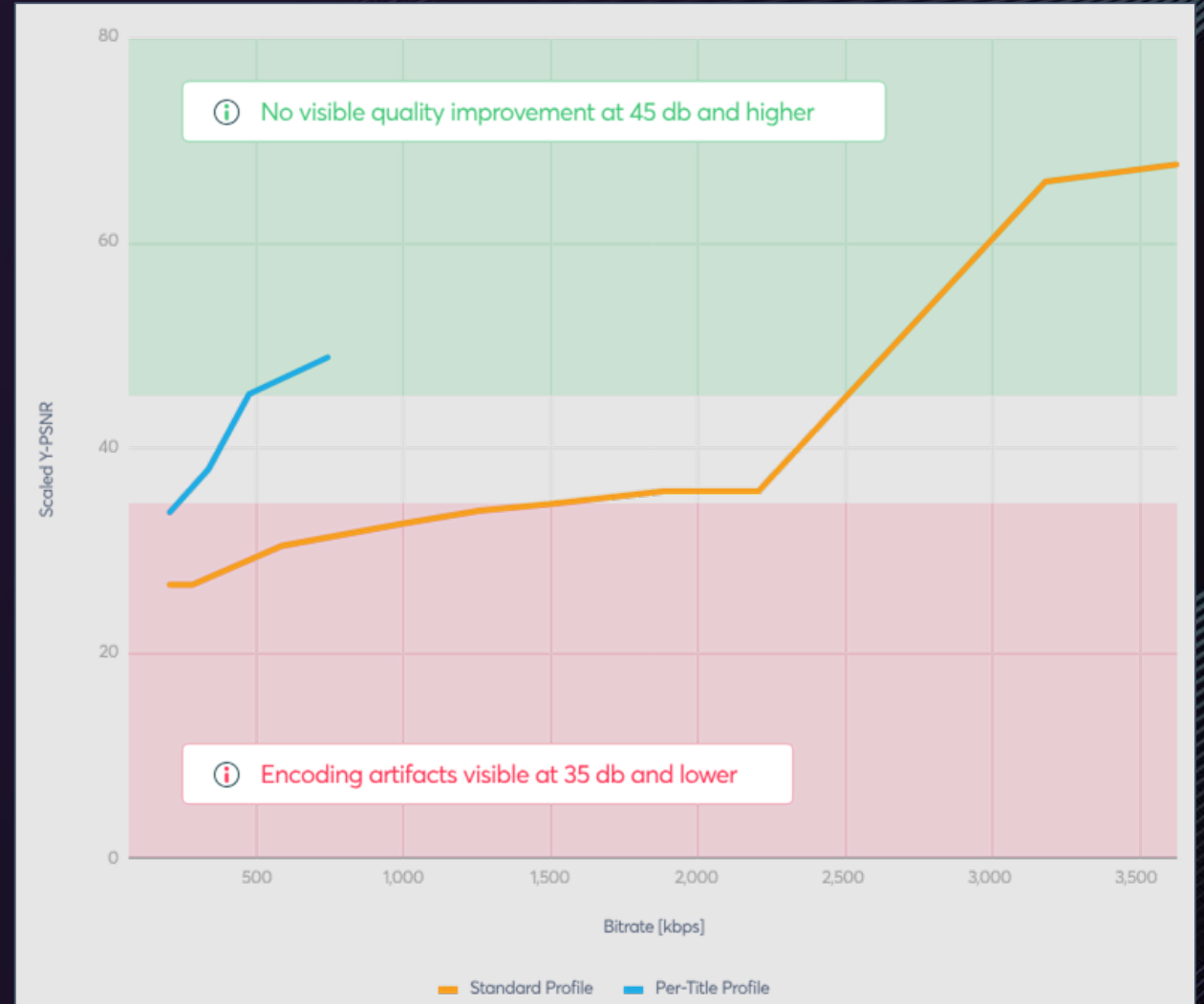
# Methodology



# Per-Title Encoding

Optimize the ABR ladder for any given source asset

- Optimize bitrate ladder for every single title to maximize QoE
- Compute a special purpose bitrate ladder based on complexity analysis
- Use bitrate to encode content in a quality that viewers can actually enjoy, but not more!
- Improves quality, and reduce bitrate for less complex content
- Reduce costs for files with low complexity in terms of encoding, storage and distribution



# Per-Title Encoding

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## Benefits

1. Bitrate reduction - Saving money on CDN Egress

2. Storage reduction - Saving money on Storage

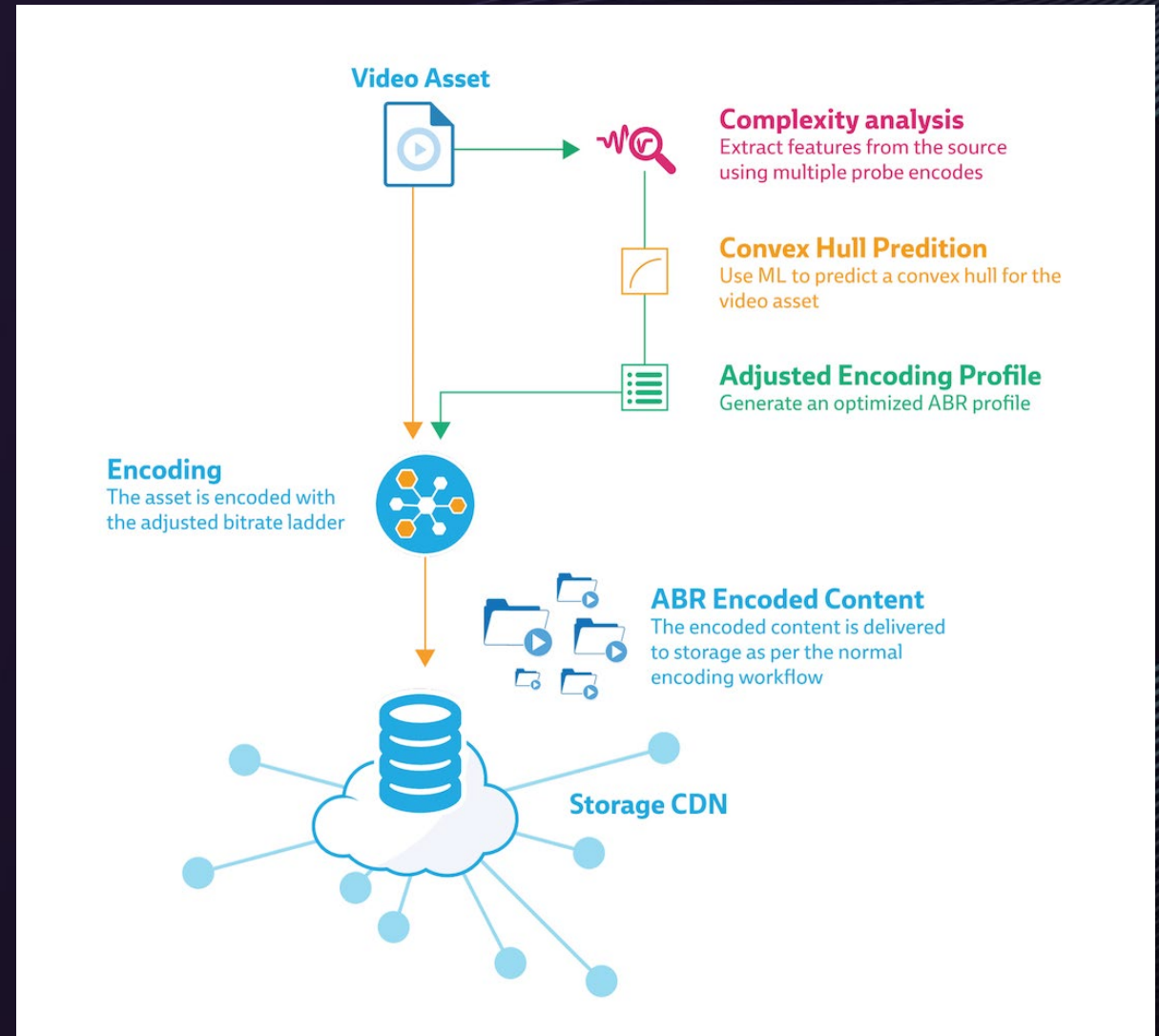
### 3. Quality improvement

- Consistent perceptual quality across media library
- Encode every asset in the quality users enjoy, **but not more**
- Present high quality also to viewers in **low bandwidth scenarios** (developing countries, mobile connections, etc.)



# Per-Title Encoding: Workflow

- Complexity analysis built-in during encoding step
- Bitrate ladder boundaries fully configurable by user
  - Upper limit for highest bitrate
  - Lower limit for lowest bitrate
  - Target quality level
  - Step sizes between renditions (SD, HD, UHD)
- Enforce business rules





# Results



# Per-Title Encoding

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Success stories from a variety of customers

- **US Premium Channel** - International expansion project. *80% file size reduction* over standard encoding solution.
- **Premium Content Provider in JP** - *30% TCO reduction* with “same visual quality at half the bitrate”
- **Australian SVOD** - Through a combination of 3-Pass and Per-Title Encoding, *reduced CDN costs by 25%*.
- **Short-Form News** - Per-Title a *60% bitrate reduction* and *70% storage savings* at the same visual quality.
- **Emerging Market SVOD** - Per-Title helped *reduce 30% on storage and overall encoding costs* through lesser renditions.

# Case Study #1: Premium Content

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Content aggregator in Japan with premium long-form content

- Customer replacing largely on-prem workflow
- Utilizing Per-Title, Three-Pass, and Multi-Codec distribution
- Sold on the flexibility of Per-Title; Not only does it do a great job, but you can define business rules (certain renditions must appear at certain resolutions/bitrates) to help it fit with their business
- **Top-Line Results:**
  - **30% reduction in CDN commit**
  - Total assets to date is around 75k
  - 225k encodes (h264, HEVC, VP9)



# Case Study #1: Premium Content

Content aggregator in Japan with premium long-form content



Bitrate (kbps)	Resolution
200	256 x 144
400	512 x 288
750	640 x 360
1200	854 x 480
1600	1024 x 576
2500	1280 x 720
3500	1280 x 720
4500	1920 x 1080
6500	1920 x 1080
<b>Total Size</b>	<b>1363.2 MB</b>



Bitrate (kbps)	Resolution
240	512 x 288
456	854 x 480
693.44	1024 x 576
1317.54	1280 x 720
2104.61	1920 x 1080
3361.86	1920 x 1080
<b>Total Size</b>	<b>587.3 MB</b>

## Average Bitrate

2350 Kbps -> 1362.25 Kbps (-42%)

## Storage Consumed

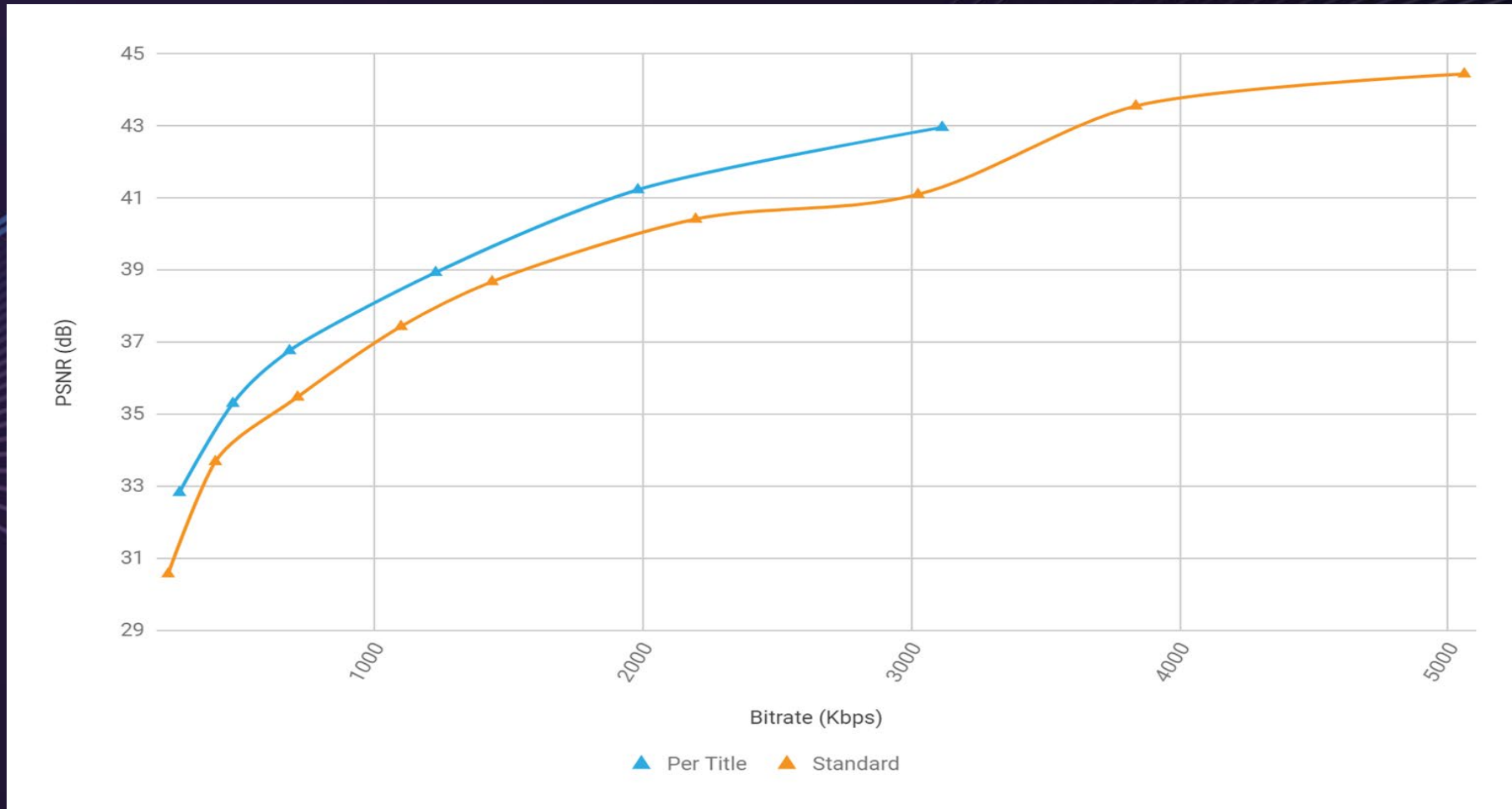
1363.2 MB -> 587.3 MB (-56.9%)

## QOE (Full HD Available)

4500 Kbps -> 2104.61 Kbps (-53.2%)

# Case Study #1: Premium Content

Content aggregator in Japan with premium long-form content





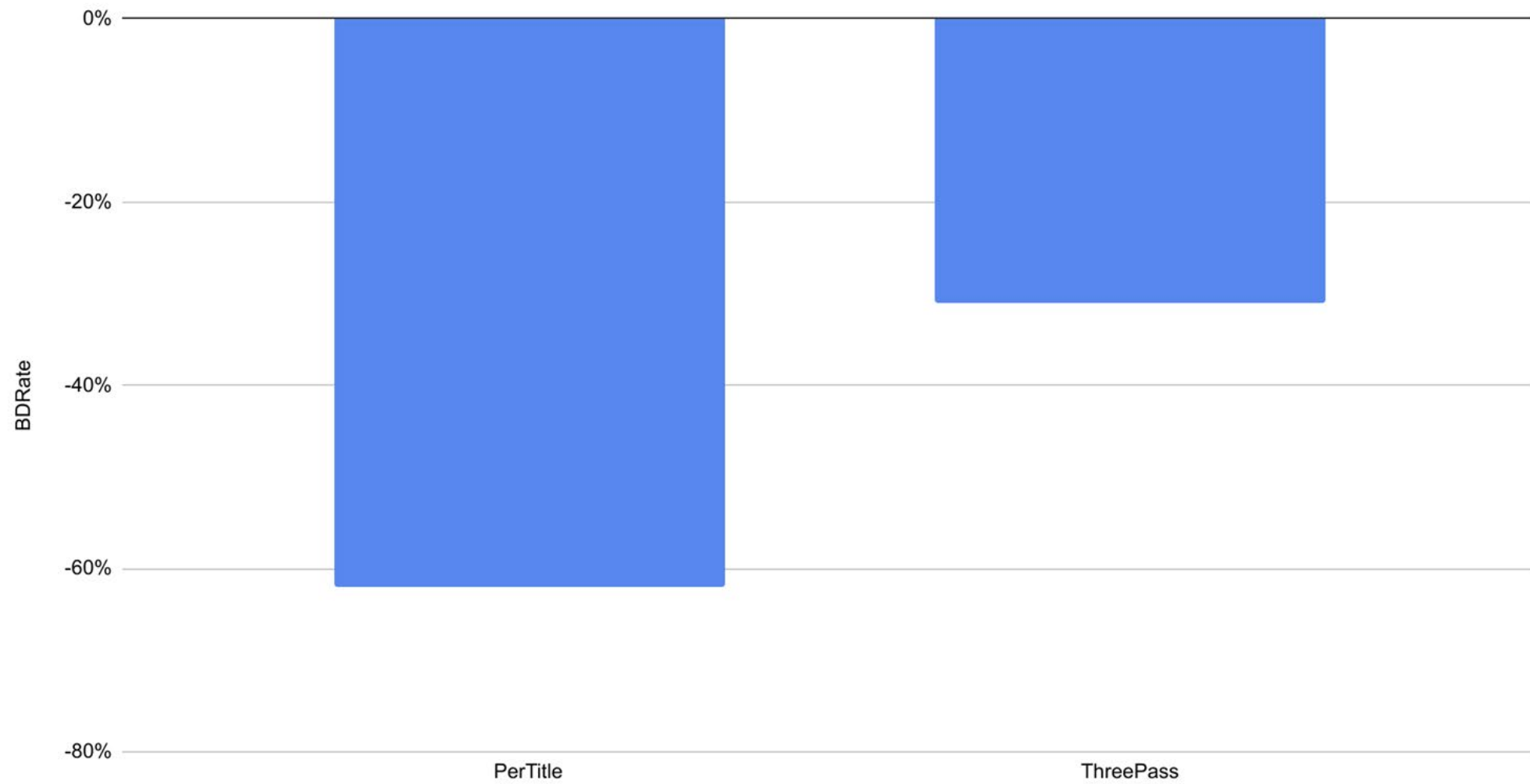
# Case Study #2: Short -Form News

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Content provider with short-form news content

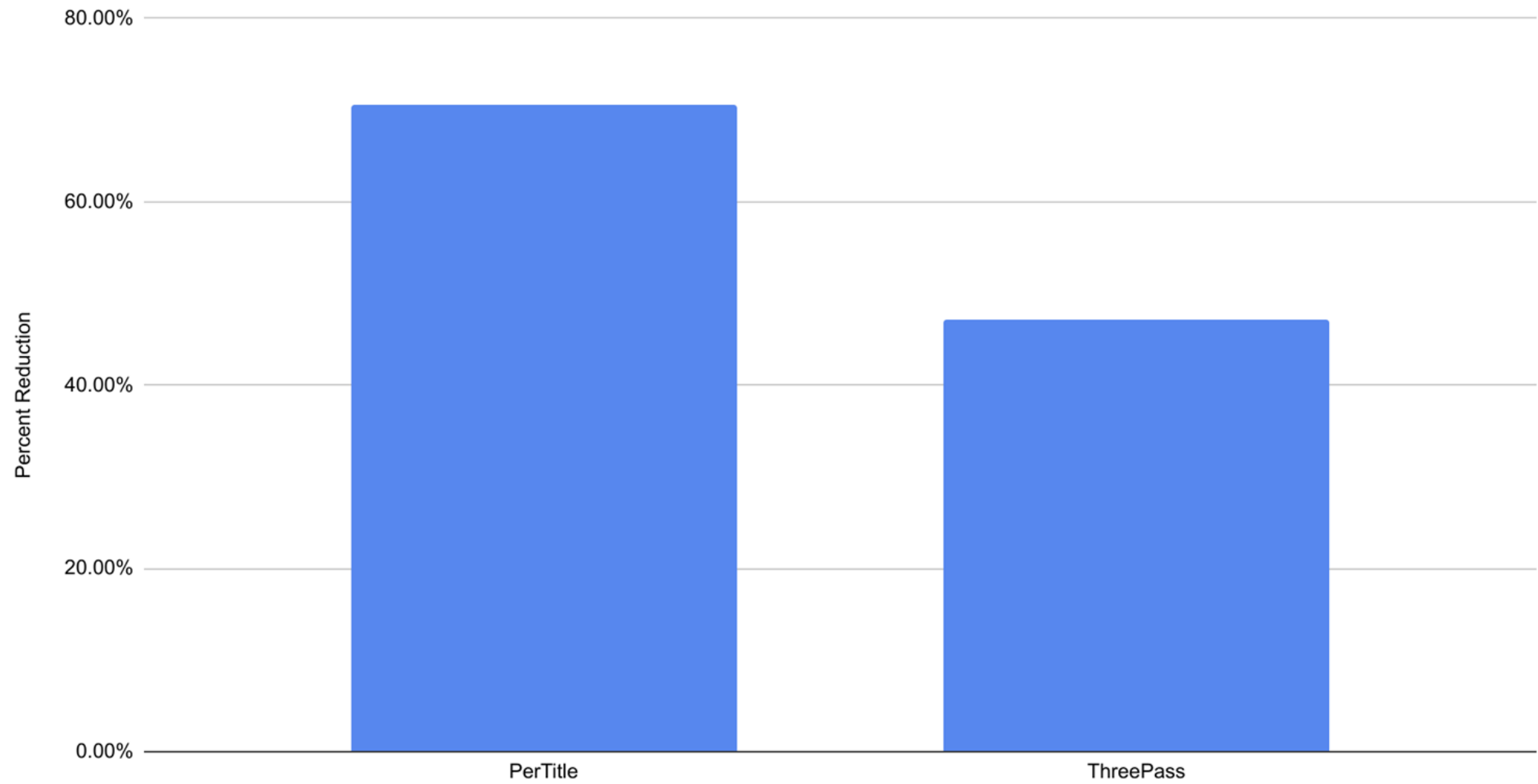
- Compared customer ABR encodes with Bitmovin's Three -Pass and Bitmovin's Per -Title Encoding
- Compute a special purpose bitrate ladder based on complexity analysis
- Improves quality, and reduce bitrate for less complex content
- Reduce costs for files with low complexity in terms of encoding, storage and distribution
- Top-Line Per-Title Results:
  - **61.6% Bitrate reduction** at equivalent quality
  - **69.3% File size reduction**
  - Tighter frame quality grouping

## BDRate vs Current Encodes





## Net File Size Percent Reduction vs. Current Encode



## Size (GB) of All Files

