What it Takes to Capture to Flash
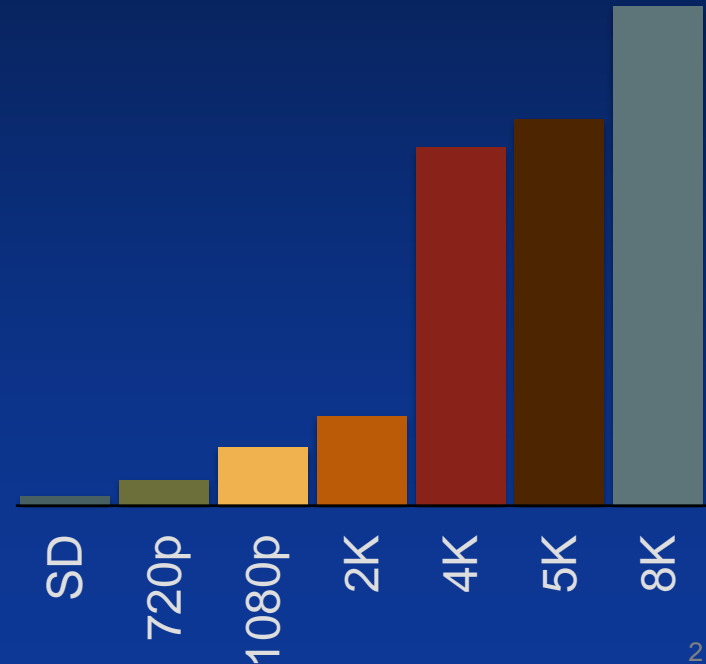## A manufacturer &
retailer perspective

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Video Demands on Storage

- Constant advances in video quality
- Different types of video
  - Frame rates, resolutions, compressions

Video Data Rate Trends

SD 720p 1080p 2K 4K 5K 8K

Flash is not one size fits all

- Different flash designs
  - SLC, MLC, EMLC, TLC, 3D VNAND
  - Asynchronous, synchronous
- Different flash grades
  - Tier 1, Tier 2

- Different data management features
  - Compression
  - Garbage collection
  - Error correction
  - Over-provisioning

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How to Address the Challenges

- From a manufacturer & retailer perspective
  - How do we optimize our drives?
    - The best balance of cost, performance, longevity, and capacity?
  - How do we ensure customers buy the right drive?

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How to Address: Manufacturing

The best balance: *Synchronous MLC flash with compression and over-provisioning*

Cost:

- Using MLC flash is less expensive than SLC

Longevity:

- Using compression lowers write amplification
- Over-provisioning provides reliability & longevity of the drive

Performance:

- Using synchronous flash reduces the negative performance impact compression can have on incompressible data rates

Capacity:

- MLC flash provides more capacity than SLC

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How to Address: Closed vs. Open

Ensuring customers use the right drives

Closed model

Camera brand X says you must use their drives/modules

- The best way to eliminate any possibility of incompatibilities

- Do customers still wish they had a choice?

Open model

Camera brand Y suggests you use drives they have qualified

- Gives customer choices

- Opens the door for problems

- Testing & certification is key

How to Address: Testing & Certification

- Both a solution and challenge
  - Easy and effective way to ensure customers buy what they need for their use
  - The quantity of variables needing to be tested and certified are challenging
- Best method for testing & certification?

How to Address: Testing & Certification

- Certification Process
  - Video-specific benchmark applications
  - Real world testing
  - Camera/capture device manufacturer certification programs
    - Need more!

Consumers

- What do video professionals need to look for?
  - Find the specs that actually matter
    - Relevant data rates (ex. incompressible)
    - Grade of NAND flash
    - Reliability ratings
  - Only used certified firmware revisions

Summary

- Increasing manufacturer certification programs will be the best way to ease the burden on the consumer while still giving them choices in what they use