



# The Challenge: Advancing Cinema Quality

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# Definition of Cinema

**cin·e·ma** *n.*

- A film or movie.  
A movie theater.
- Films or movies considered as a group.  
The film or movie industry.
- The art or technique of making films or movies; filmmaking.

# Definition of Broadcast

**broad·cast** *n.*

- Transmission of a radio or television program or signal for public use.
  - A radio or television program: *watched the morning news broadcast.*
  - The duration of such a program.

# [ Definition of Video ]

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**vid·e·o** *adj.*

- Of or relating to television, especially televised images.
- Of or relating to videotaped productions or videotape equipment and technology.

# What Makes Film Standout?

- Motion Pictures are not video and not broadcast television
- Film projected on large screen, Broadcast uses a smaller screen having a fixed technology
- DC: Files vs Streams
- Cinematographer vs Cameraman

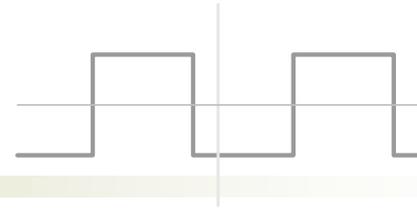


# [ Film Quality ]



- Quality
  - Large dynamic range
  - Large color space
  - Long archival life
- Flexibility
  - Resolution & color can be improved without obsolescence
  - Aspect ratio (w/lens & aperture plate)
  - Sound

# [ Digital Quality ]



## ■ Quality

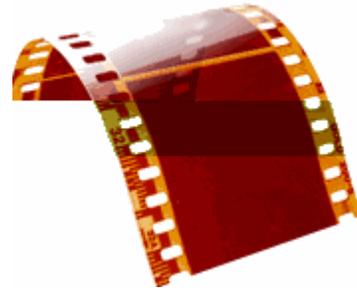
- Dynamic range depends on bit depth
- Color space can be very large
- Archival life dependent upon storage

## ■ Flexibility

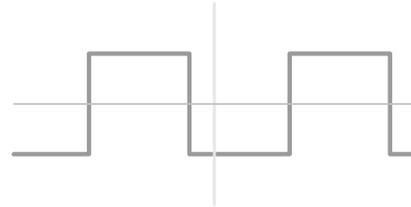
- Limits cannot be extended
  - requires forward thinking

# [ Dynamic Range ]

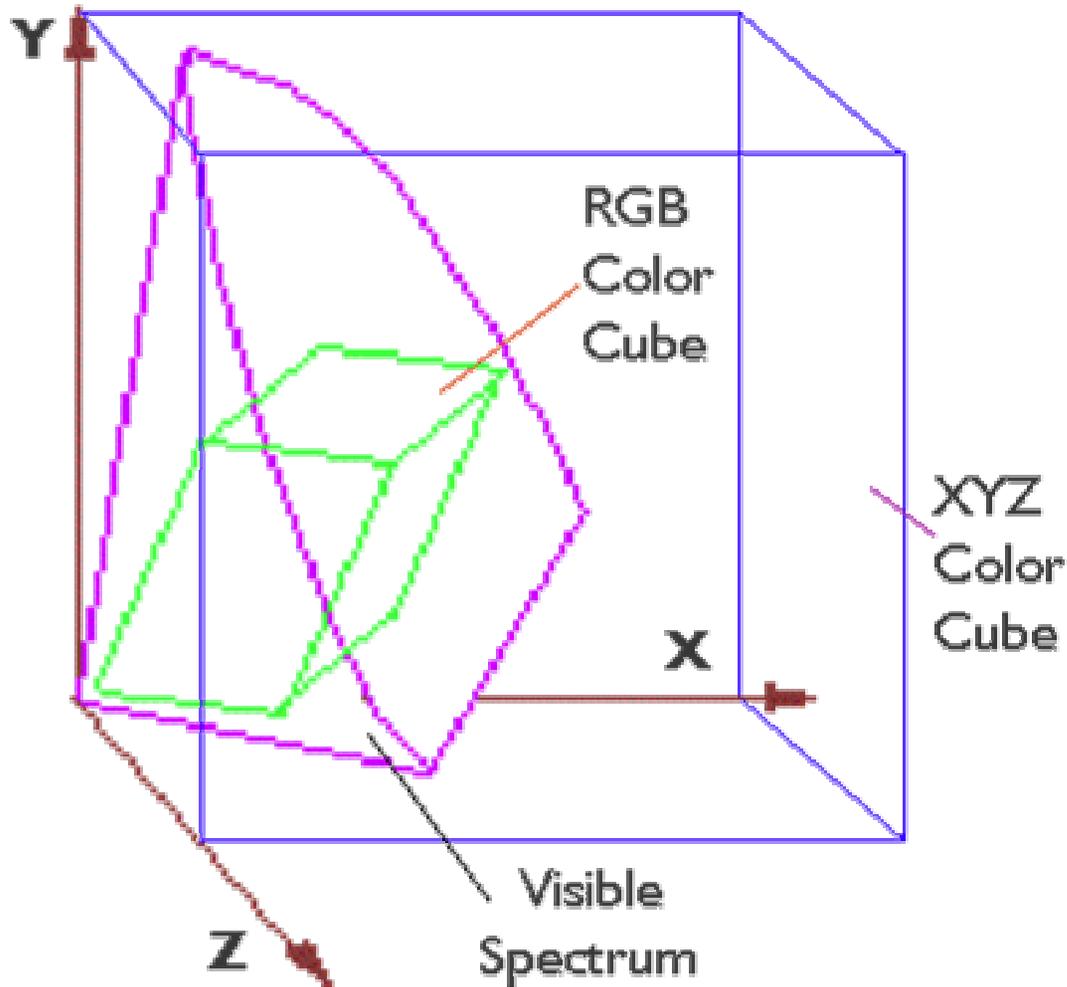
- Film > 10 stops



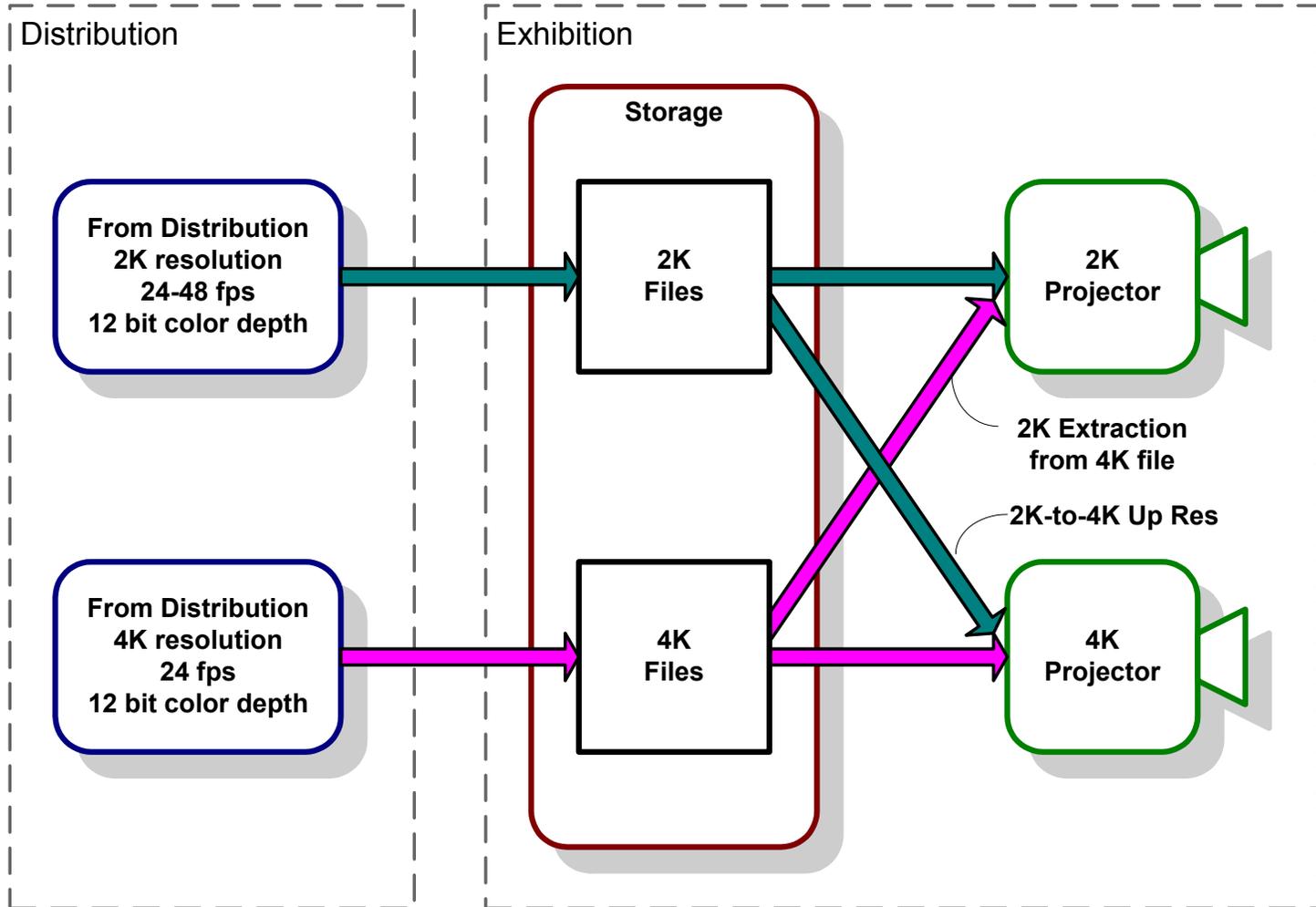
- 12-bit Color Depth  
= ? stops (log)  
(DPX 10-bit > 11 stops)



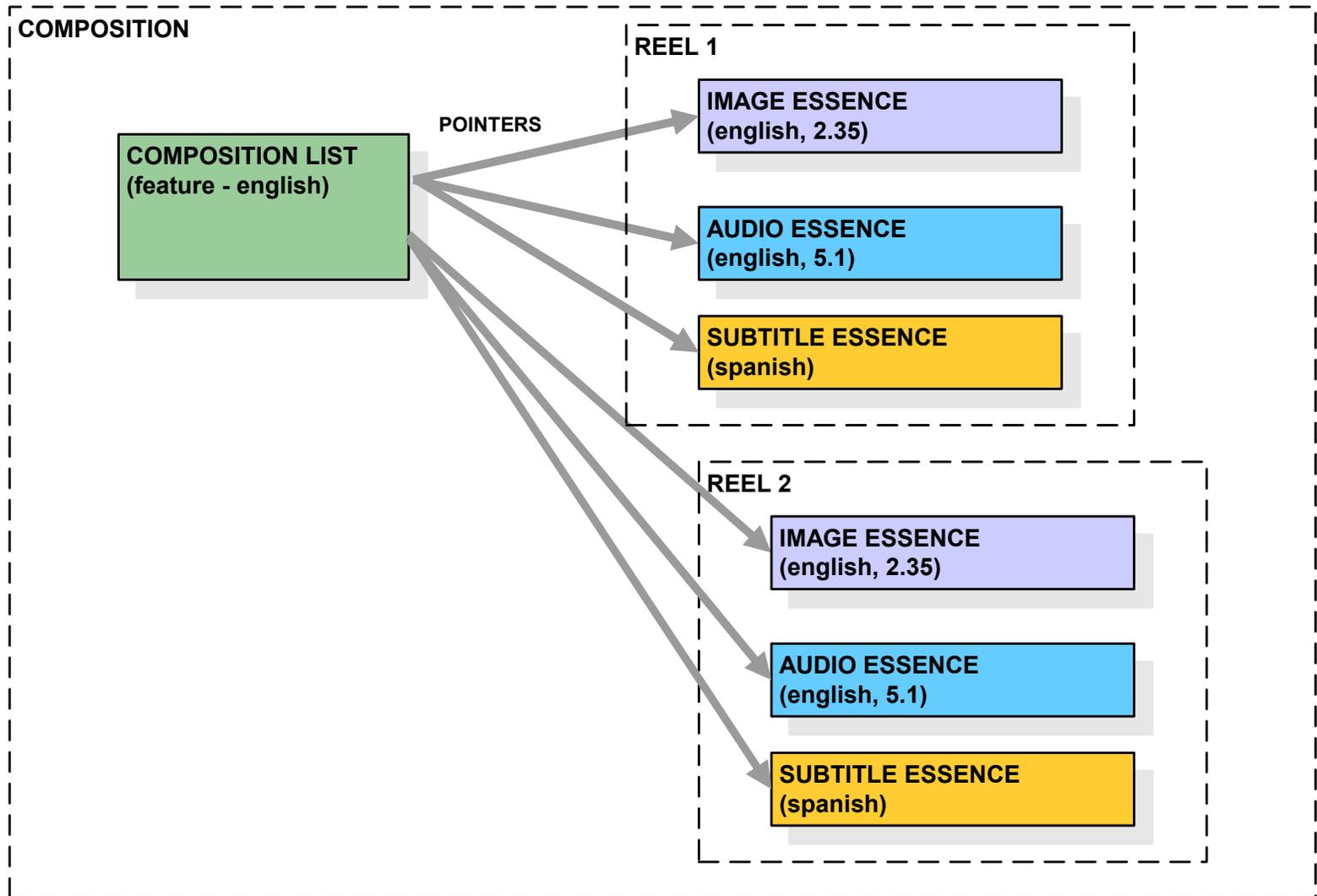
# [ Color Space ]



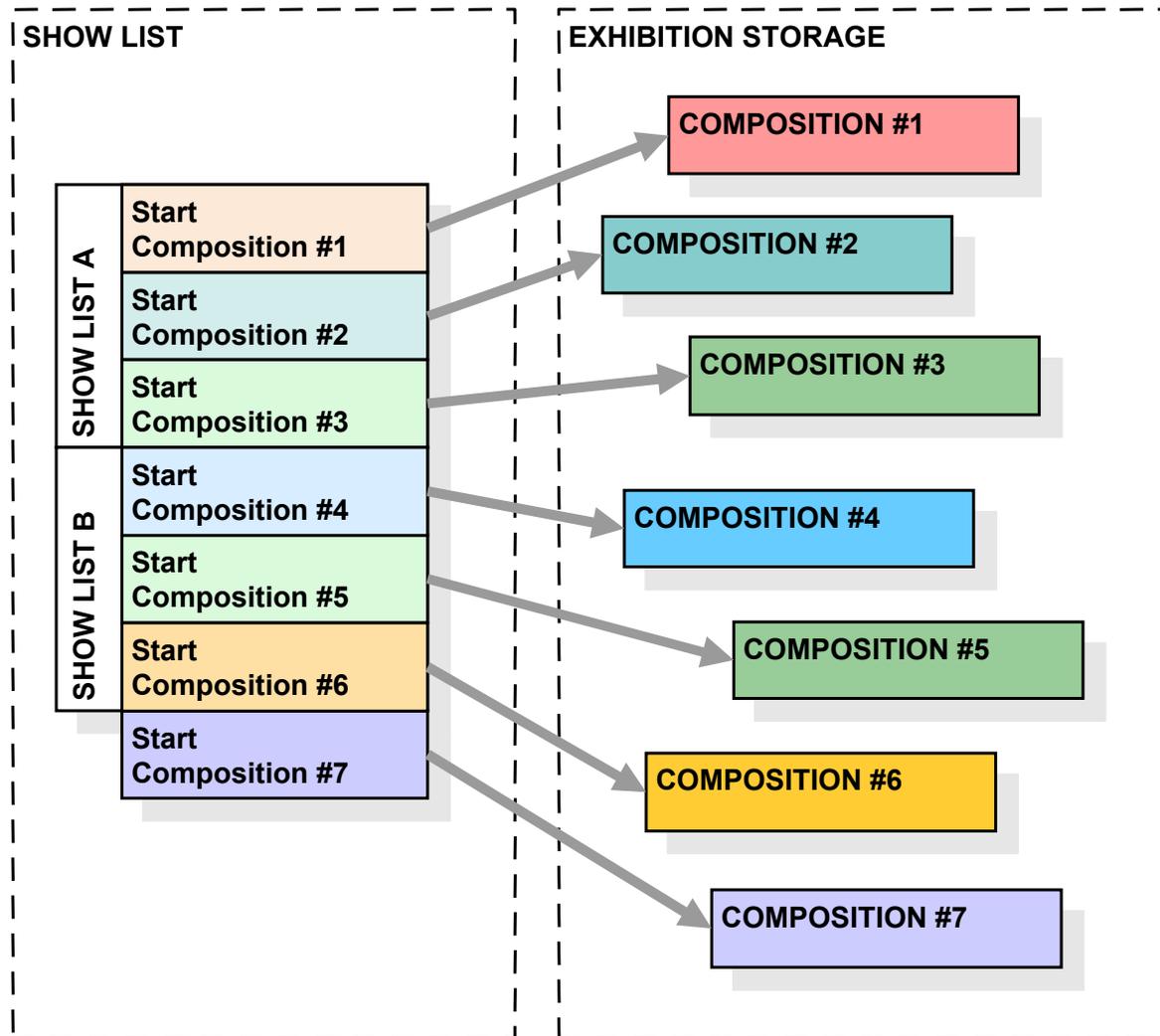
# Resolution



# Flexibility in Packaging



# Flexibility in Creating Shows



# [ Security & Trust ]



- Not a quality issue – but significant
- Trust with Film
  - Booth assumed to be locked
  - Camcorder copying a larger threat
- Trust with Digital
  - Encrypted content will be distributed
  - Trend assumes the booth is not locked
  - Camcorder copying a larger threat

# [ What Holds DC Back? ]

- Cost
- Quality
- Flexibility
  - Interoperability weak if at all
  - Exhibitors have not experienced flexibility
- Security
- Business

# [ Cost

#1 ]

- Projector



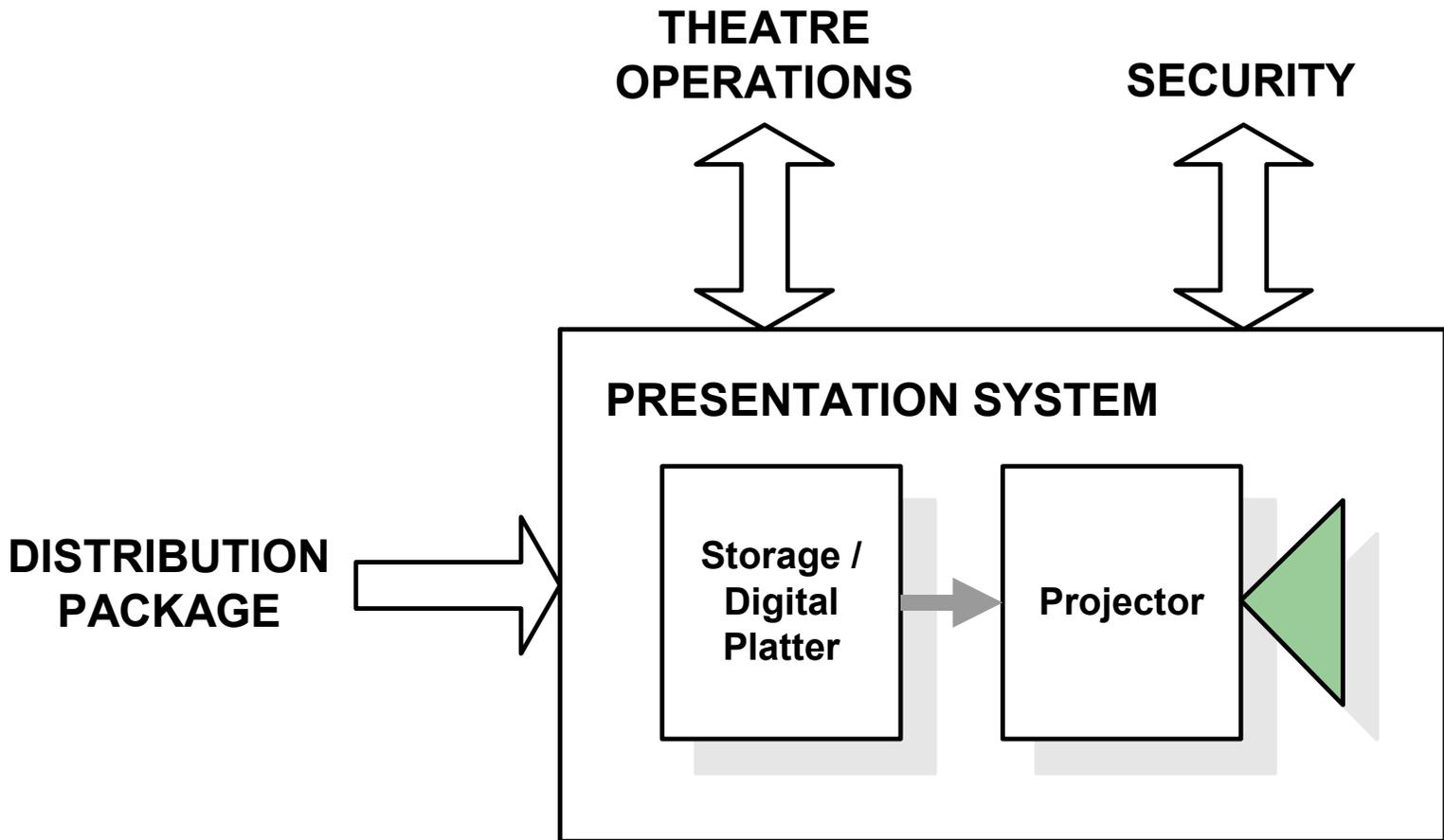
# [ Cost

#2 ]

- Server



# [ System View ]



# [ The Challenge ]

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- Digital cinema can exceed the quality of film, but not with broadcast style technology.
- Cost, interoperability, security, and business issues remain to be solved.



Thank you

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