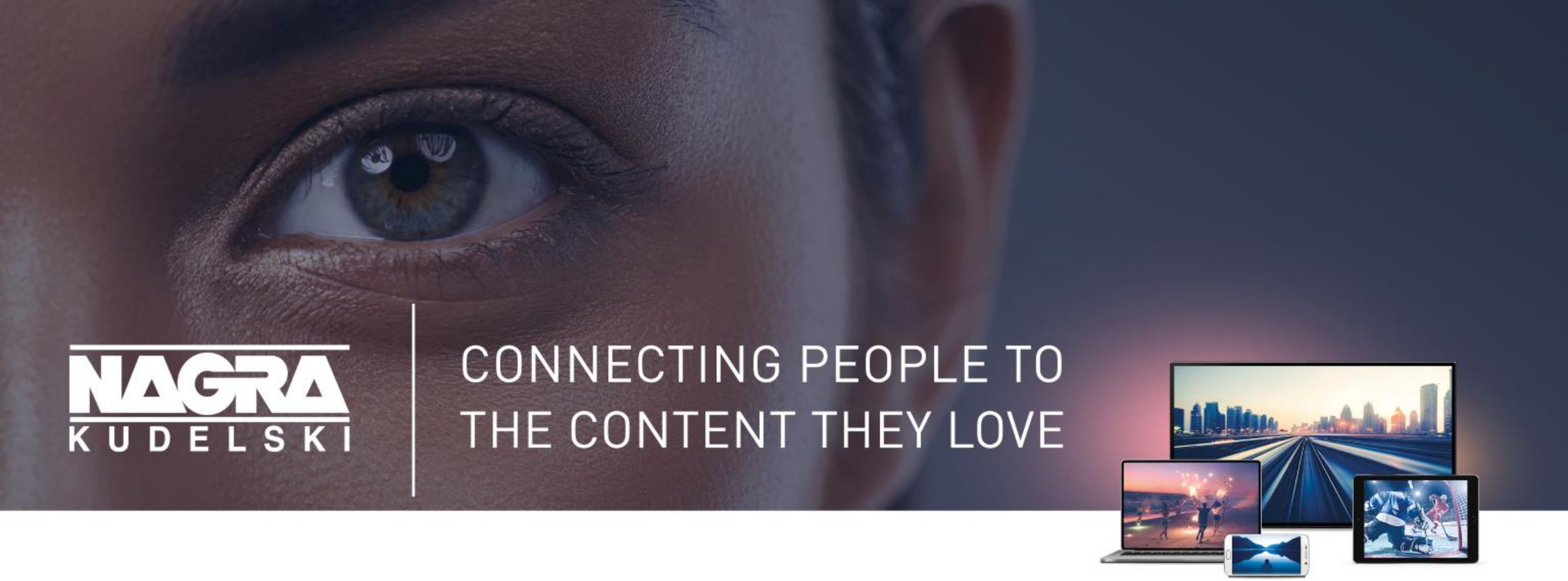


CONNECTING PEOPLE TO THE CONTENT THEY LOVE

Securing your Pre-Release Workflow in the Cloud

Gabriel Cantin, April 8th, 2018

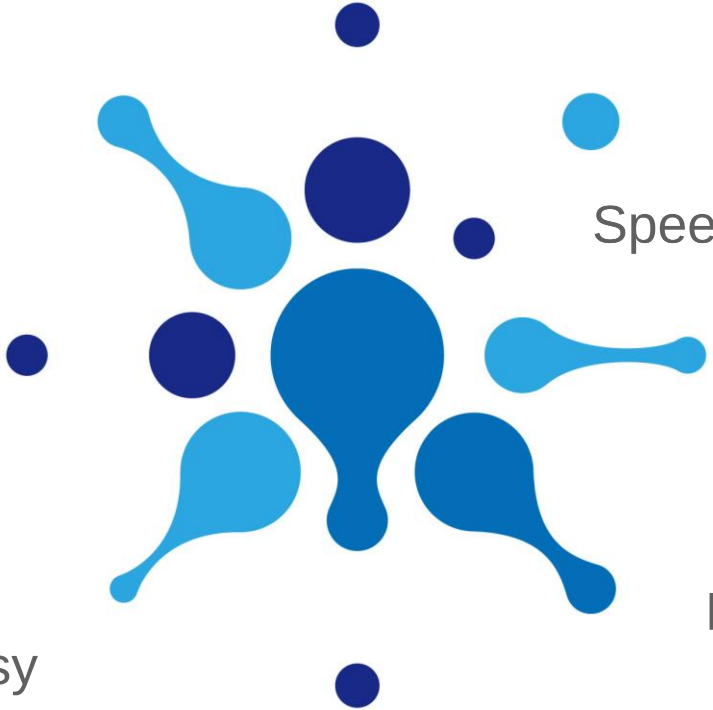
The M&E industry is moving to the cloud

The cloud, our new reality

- It usually starts with discussion about « overflow/burst capacity in the cloud », then quickly move to a more embracing approach
- Companies are increasingly investigating their cloud strategy, with a migration plan within 2 years
- Netflix and Amazon Studios are exclusively using the cloud for the production of their original content

Hybrik, AWS Elemental

Several factors foster the convergence to the cloud



“Pay as-you-go” model

Scalability, with large cloud processing

Speed

Advanced security

Multi-cloud storage

Storage capacity

Flexibility, with easy burst/overflow management

Editing, rendering/encoding software running in the cloud

No CAPEX investment

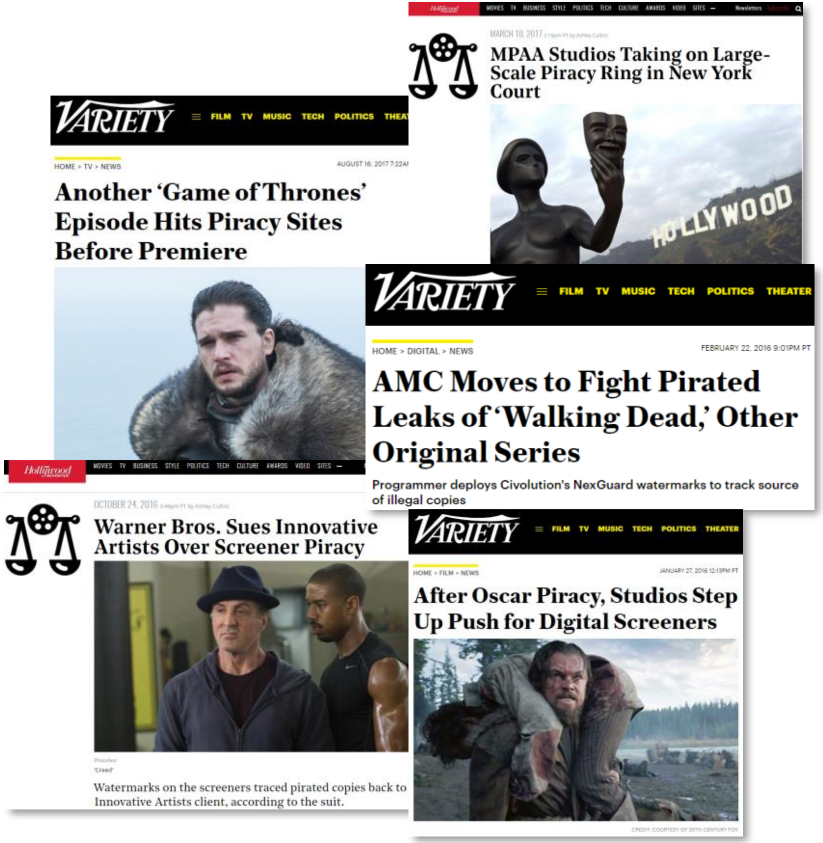
Advanced Security

- Amazon, Microsoft, Google working closely with the MPAA to ensure the highest level of security
- Full IT and security controlled by the customer
  - Controlled network traffic on the render/encoding nodes
  - No internet access and routing traffic outside the VPC
  - Monitor all access to assets
- Rendering/Encoding as a service
  - Rendering components running in the customer protected environment, with full control of their work and assets
- Content security toolsets available in the cloud
  - Encryption at rest and in motion
  - Forensic watermarking
- Secured file transfers
  - VPC-VPN endpoint for on-prem cloud file transfer
  - Secured high speed file transfer for external deliveries

Leaks occur in pre-release workflows

Any leak has a significant impact

- □ Pre-Release leaks are mainly coming from insiders
  - ○ If content is not protected, leaks can occur anytime during the pre-release content lifecycle
  - ○ And anywhere from studios, content owners, post-production facilities, third-party providers, press, rating agencies, etc.
- □ Capturing content is easy
  - ○ Digital copy is the most common way
- □ Distribution to millions of people is easy
  - ○ Enabled by ubiquitous broadband
  - ○ Peer-to-peer file sharing
- □ High quality experience on pirate website
  - ○ Advanced UI
  - ○ HD quality
  - ○ ABR streaming, on any device
  - ○ Not restricted by release windows


The Hollywood Reporter
MOVIES TV BUSINESS STYLE POLITICS TECH CULTURE AWARDS VIDEO SITES
Newsletters
VARIETY
FILM TV MUSIC TECH POLITICS THEATER
HOLLYWOOD

MARCH 10, 2017 2:18pm PT by Ashley Cullins

MPAA Studios Taking on Large-Scale Piracy Ring in New York Court

HOME > TV > NEWS AUGUST 16, 2017 7:22AM

Another 'Game of Thrones' Episode Hits Piracy Sites Before Premiere

HOME > DIGITAL > NEWS FEBRUARY 22, 2016 9:01PM PT

AMC Moves to Fight Pirated Leaks of 'Walking Dead,' Other Original Series

Programmer deploys Civolution's NexGuard watermarks to track source of illegal copies

OCTOBER 24, 2016 5:46pm PT by Ashley Cullins

Warner Bros. Sues Innovative Artists Over Screener Piracy

Photofest
'Creed'

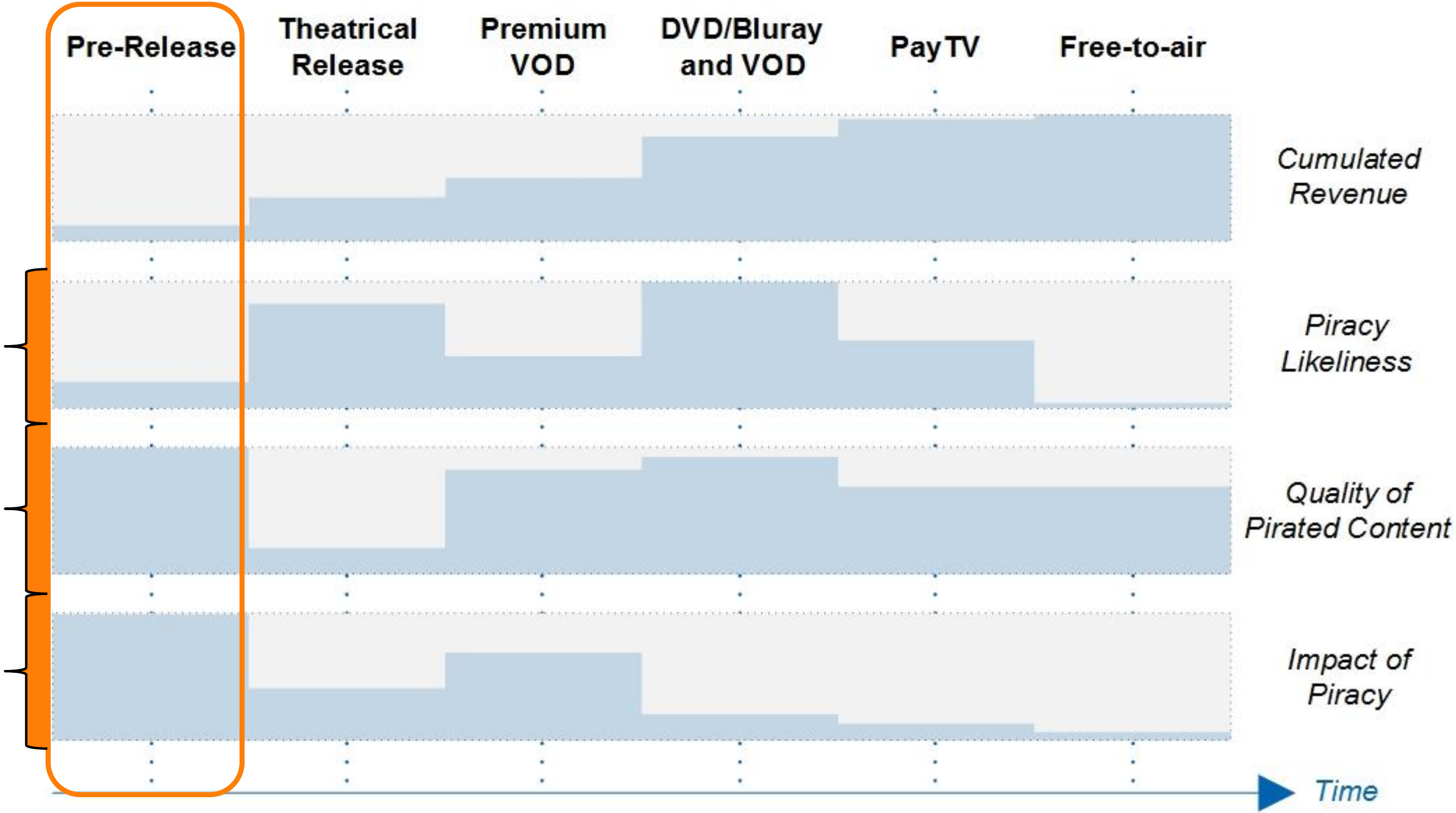
Watermarks on the screeners traced pirated copies back to Innovative Artists client, according to the suit.

HOME > FILM > NEWS JANUARY 27, 2016 12:13PM PT

After Oscar Piracy, Studios Step Up Push for Digital Screeners

CREDIT: COURTESY OF 20TH CENTURY FOX

Any leak has a significant impact on revenue

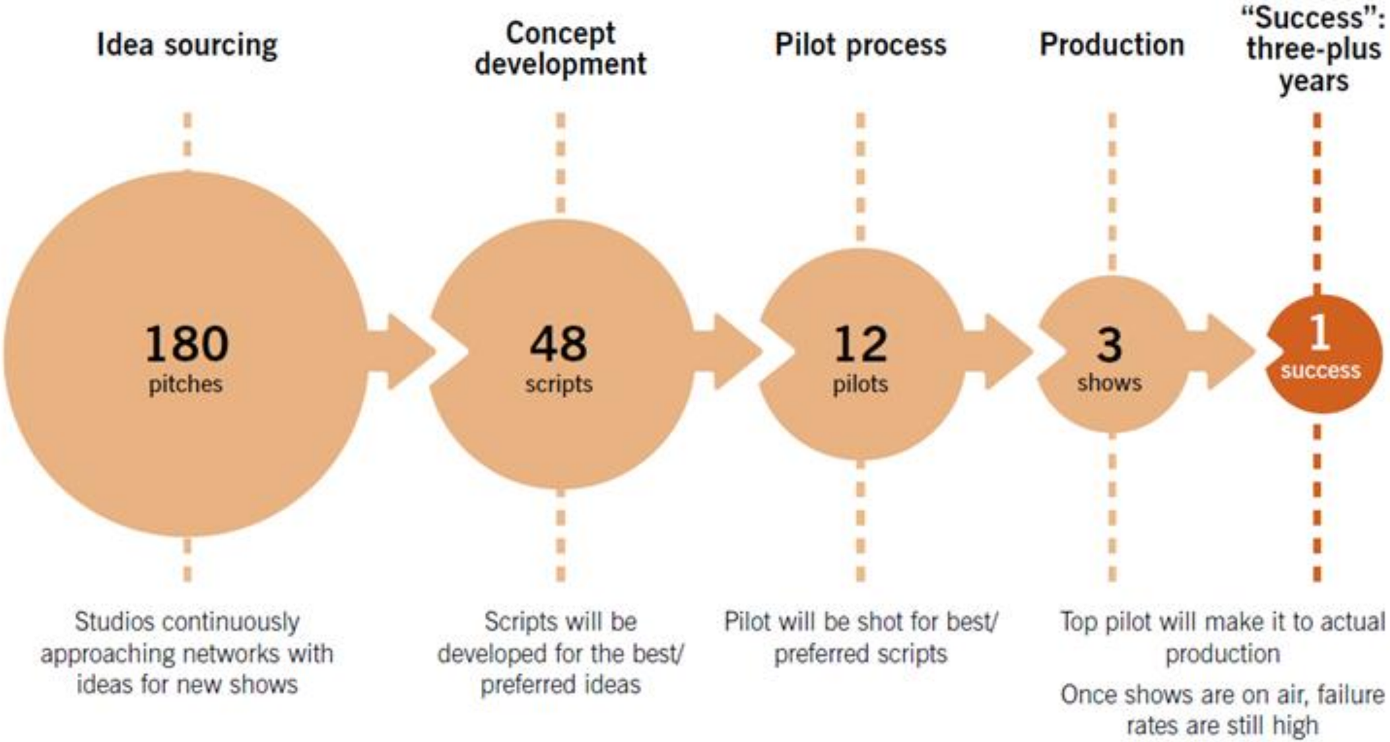


Leaks likely to occur

Pristine copy (pirate files created from mezzanine files)

Subtantial economic consequences (revenue and marketing activities

Entertainment production is a long and costly journey



Idea sourcing

Concept development

Pilot process

Production

"Success": three-plus years

180 pitches

48 scripts

12 pilots

3 shows

1 success

Studios continuously approaching networks with ideas for new shows

Scripts will be developed for the best/ preferred ideas

Pilot will be shot for best/ preferred scripts

Top pilot will make it to actual production

Once shows are on air, failure rates are still high

BCG Analysis

Content protection is critical to the creative industries

The need for Enhanced Content Protection

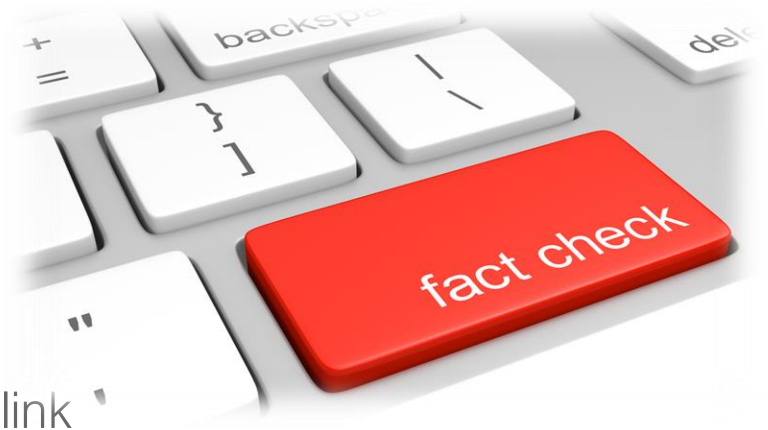
MOTION PICTURE ASSOCIATION OF AMERICA, INC.

- MPAA Content Security Program
  - Purpose
    - Strengthen the process by which content is protected during its lifecycle (production, post-production, marketing and distribution)
  - Accomplished by
    - Set of best practices by facility service outlining standard controls that help to secure content
    - Content security assessment and evaluation based on published best practices
- MPAA and CDSA just launched the Trusted Partner Network
  - Set of security standards for entertainment production and distribution companies
- Encryption and Forensic Watermarking
  - Key components in the security guidelines

TPN TRUSTED PARTNER NETWORK

https://www.mpaa.org/
https://ttpn.org/content-owners/

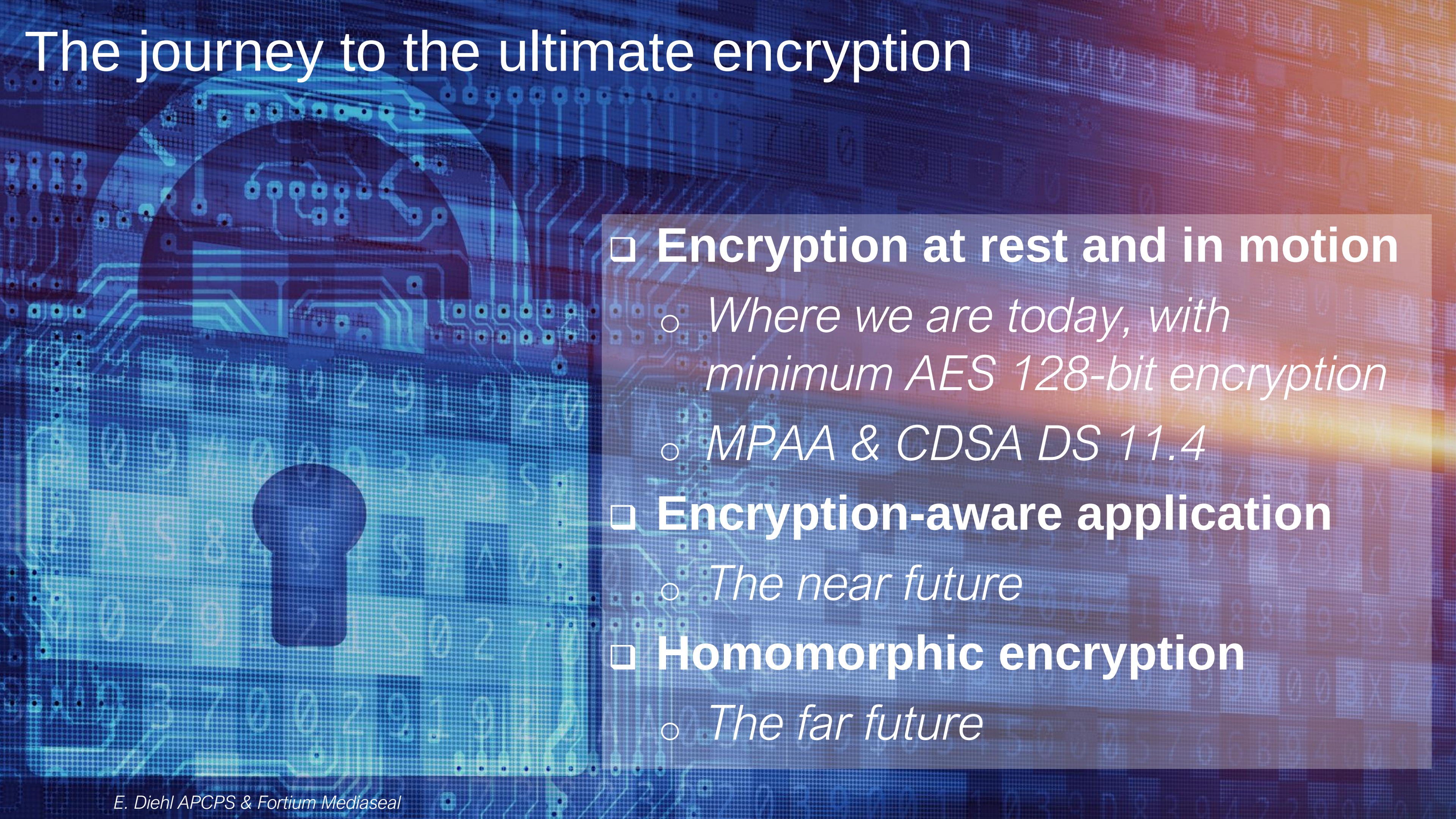
Why encrypt and watermark pre-release content?



- A few myths:
  - My IT environment is secure
    - Attackers will always find their way
  - We are among trusted people
    - Trust no one
    - You are the weakest link
    - Security is not stronger than its weakest link
  - Unfinished movie has no interest
    - Know the asset to protect
    - Early version of movies already circulated on the Internet before the theatrical release
- Vulnerabilities addressed with a combination of encryption and forensic watermarking

https://eric-diehl.com/ten-laws/

The journey to the ultimate encryption

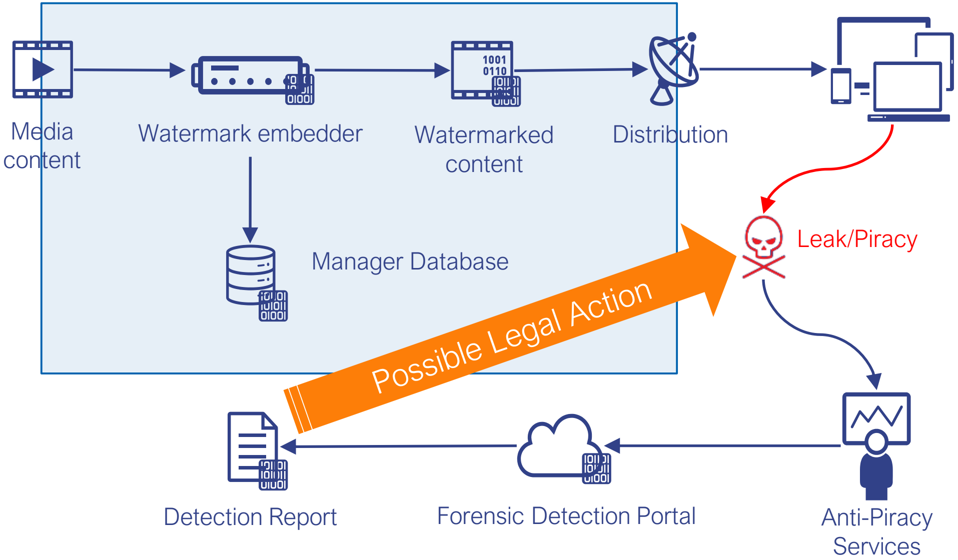


- ❑ **Encryption at rest and in motion**
  - ○ *Where we are today, with minimum AES 128-bit encryption*
  - ○ *MPAA & CDSA DS 11.4*
- ❑ **Encryption-aware application**
  - ○ *The near future*
- ❑ **Homomorphic encryption**
  - ○ *The far future*

The power of forensic watermarking

Watermarking makes each content copy unique

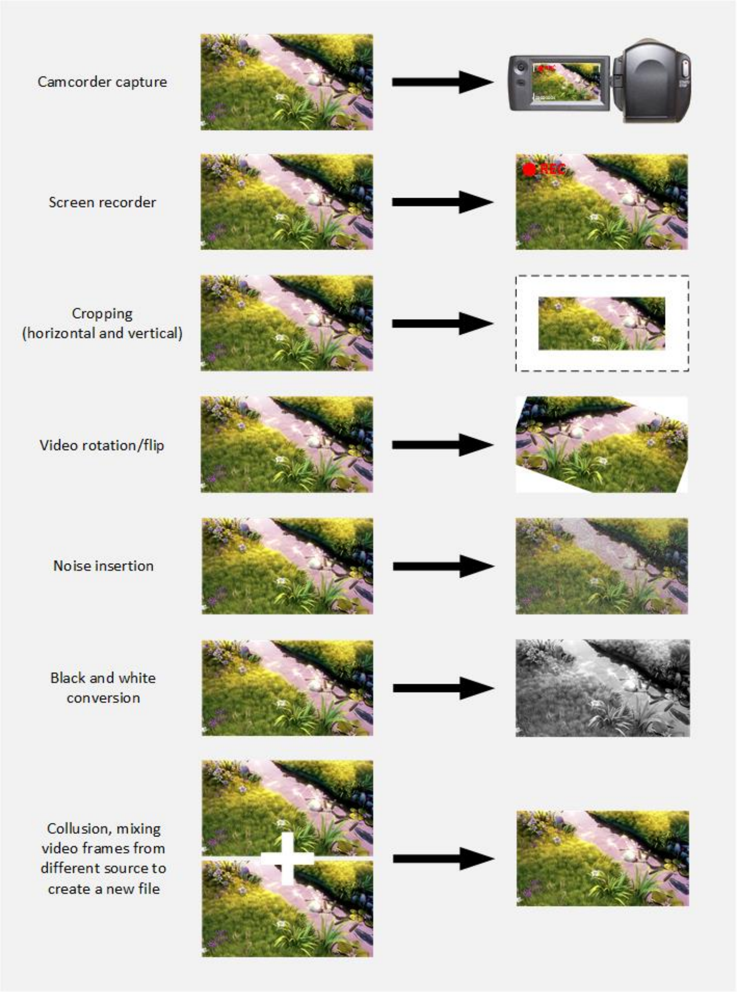
- Watermarking involves the embedding of unique, imperceptible and inseparable information into the audio or video
- Trace any leak back to its source



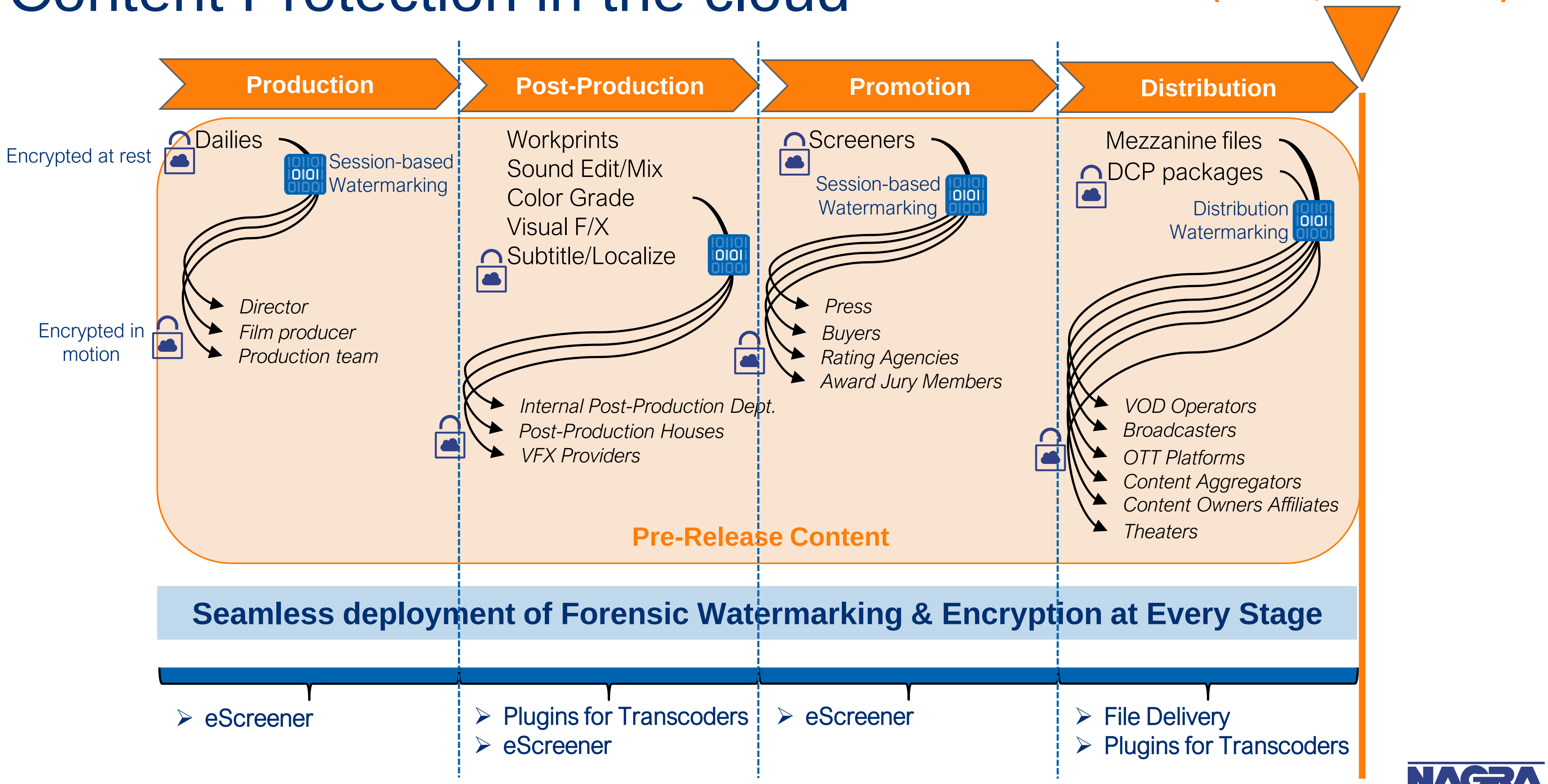
Key requirements for the watermark

Tradeoff between Imperceptibility, Robustness and Payload Size

- □ Imperceptibility
  - ○ Doesn't impact the quality viewing experience
- □ Robustness
  - ○ Survives severe degradations of the content, beyond the point that it has any commercial value
- □ Blind detection
  - ○ Thus allowing automation


Camcorder capture
Screen recorder
Cropping (horizontal and vertical)
Video rotation/flip
Noise insertion
Black and white conversion
Collusion, mixing video frames from different source to create a new file

Content Protection in the cloud



Content Release (Theater, Premium VOD)

Production | **Post-Production** | **Promotion** | **Distribution**

Encrypted at rest

Encrypted in motion

Production

Dailies

Session-based Watermarking

- *Director*
- *Film producer*
- *Production team*

Post-Production

Workprints
Sound Edit/Mix
Color Grade
Visual F/X
Subtitle/Localize

- *Internal Post-Production Dept.*
- *Post-Production Houses*
- *VFX Providers*

Promotion

Screeners

Session-based Watermarking

- *Press*
- *Buyers*
- *Rating Agencies*
- *Award Jury Members*

Distribution

Mezzanine files
DCP packages

Distribution Watermarking

- *VOD Operators*
- *Broadcasters*
- *OTT Platforms*
- *Content Aggregators*
- *Content Owners Affiliates*
- *Theaters*

Pre-Release Content

Seamless deployment of Forensic Watermarking & Encryption at Every Stage

Production:
- eScreener

Post-Production:
- Plugins for Transcoders
- eScreener

Promotion:
- eScreener

Distribution:
- File Delivery
- Plugins for Transcoders