DIGITAL WATERMARKING
ALLIANCE

CDSR CONTENT PROTECTION | SUMMIT | December 7, 2016 | L.A. Marina del Rey Marriott

Rajan Samtani, Senior Advisor

Introduction to Digital Watermarking

- Digital Watermarking is a signal processing technique to embed a pattern of bits dispersed into the digital image, video or audio content

- Digital Watermarks are designed to be imperceptible to the human eye, or in the case of audio clips, to be inaudible to the human ear

- The main purpose of digital watermarks is to provide forensic track and trace capabilities to deter unauthorized distribution of high value digital content

  - The actual data bits representing the watermark are usually dispersed inside the file such that they cannot be easily identified and manipulated

  - Digital watermarks must be robust enough to withstand normal changes such as format conversions, lossy compression, as well as D to A changes

  - Special detection software is needed to extract and decode the watermark

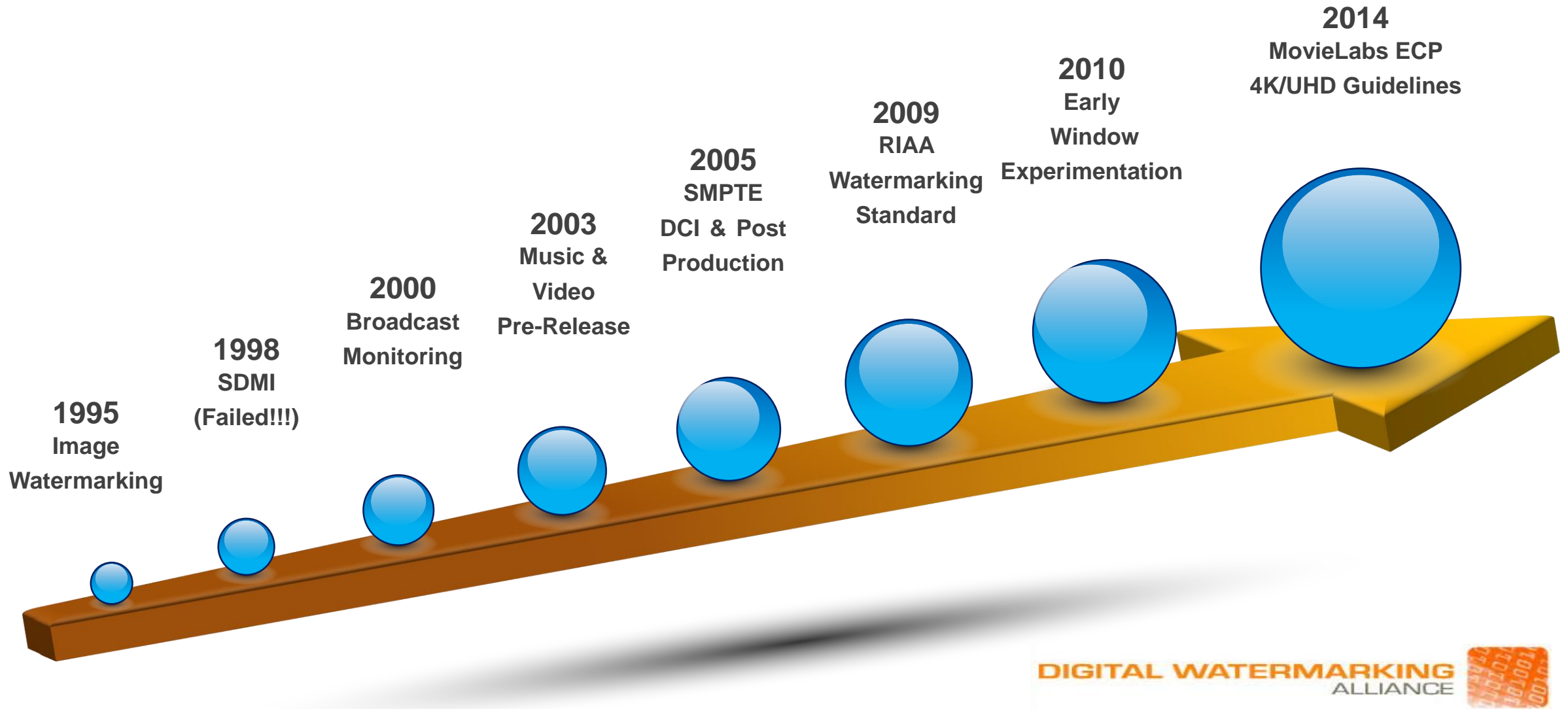### NOTE: DIGITAL WATERMARKING *IS NOT* A VISIBLE OVERLAY

Digital Watermarking Requires Trade-Offs and Optimization

– **Perceptibility:** Variable human sensory perceptions between experts and novices (visual and auditory)

– **Robustness:** Ability for the watermark to survive many different signal processing alterations (compression, D to A and A to D, Geometric distortion, etc.)

– **Data Rate:** Amount of information required in the payload

– **Computational Complexity:** Cycles available at the embedder and the detector for low latency insertion and scalable detection

– **Security:** Ability to withstand attacks from malicious actors (Protocol attacks, Statistical attacks)

– **Bandwidth and Storage Overhead:** Different watermarking techniques require different levels of overhead

– **Encode/Decode Requirement:** Some watermarking techniques require a full decode and re-encode, others require partial, yet others don't require any decode/re-encode steps

– **Blind Versus Non-Blind Detection:** Different watermarking techniques require different levels of knowledge about the original content

Satisfying all these requirements requires heavy investment in R & D

DIGITAL WATERMARKING ALLIANCE

History of Watermarking Initiatives

1995
Image
Watermarking

1998
SDMI
(Failed!!!)

2000
Broadcast
Monitoring

2003
Music &
Video
Pre-Release

2005
SMPTE
DCI & Post
Production

2009
RIAA
Watermarking
Standard

2010
Early
Window
Experimentation

2014
MovieLabs ECP
4K/UHD Guidelines

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2017 Will Be A Landmark Year For Watermarking

- MovieLabs Published the Enhanced Content Protection Guidelines document for 4K UHD Content in 2014

- Forensic Watermarking is now a "requirement" for licensing of UltraHD and early window content

- This was the catalyst for the rest of the ecosystem to be involved, including broadcasters, OTT distributors, SoC manufacturers, encoding vendors

- Today, several solutions are available that can support the UHD-1 specs including HEVC, HDR

- Important standards/best practices efforts are underway at UHD Forum and within the DWA

DWA's Membership and Role in the Ecosystem

Charter

The Digital Watermarking Alliance (DWA) is a group of companies which are actively involved in commercialization of Digital Watermarking-based Applications, Systems and Services, and share a common interest in furthering the adoption of *digital watermarking* globally.

Mission

The mission of the DWA is to create awareness and promote the value of *digital watermarking* to content owners, industry, policy makers, and consumers.

www.DigitalWatermarkingAlliance.org   Whitepapers • Resources • Information

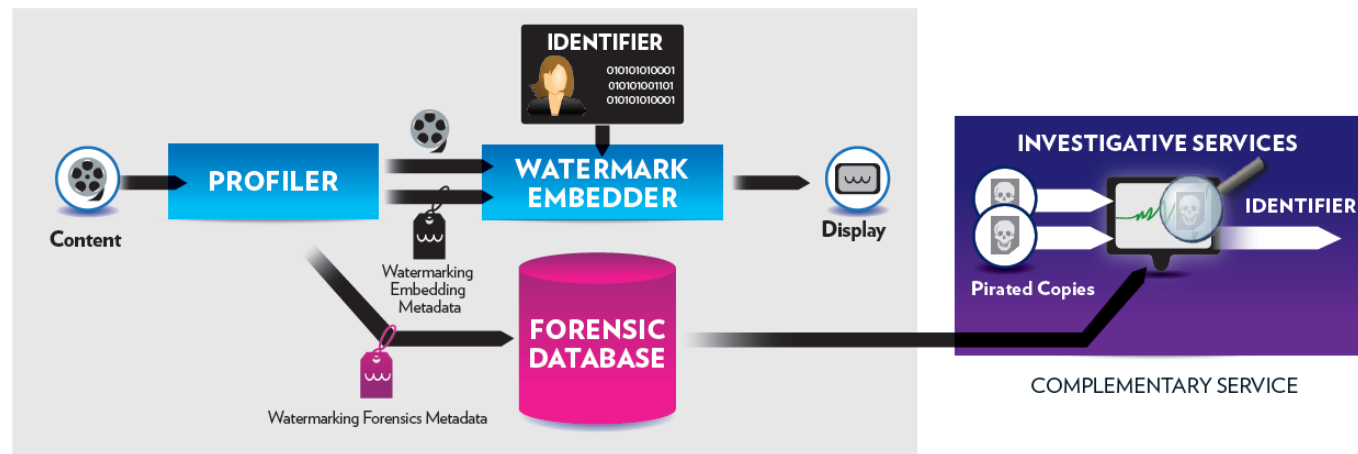# Get Ready To Hear From Your Potential Partners

You will now have a chance to review each of our member profiles

Please Note: They **all** love long walks on the beach!!

ContentArmor video watermarking in a nutshell

A unique watermarking technology

- Only solution operating directly on the bitstream

- Secure and renewable solution

- Can be easily integrated at any place in the workflow

A recognized solution

- Tested and used by several Hollywood studios

- Robustness successfully appraised by several major Conditional Access vendors

Adapted to multiple usages, from Content Creation to End-Users distribution

On demand watermarking for every step of content production

- Safestream is an on-demand watermarking with flexible templating and dynamic data fields for Pre-Release market

- It individualizes content catalogs in real-time so each stream is unique to a user

- MediaSilo and ContentArmor have partnered to offer forensic watermarking as an option of the service

ContentArmor benefits

- Forensic marks are seamlessly added « on demand » simultaneously to visual marks

- Forensic watermarking can be used earlier in the supply chain and not be limited anymore to internal or external screeners

NexGuard Introduction

What's our story

- Just went through a breakup
  - Broke up with Civolution and was acquired by The Kudelski Group in July 2016
- Why was Kudelski so attracted to us
  - To have an additional anti-piracy tool to sell to their existing customers (the operators)
  - To strengthen their solution offering to video streaming providers
  - To strengthen their relationship with original content owners
- Leader in forensic watermarking

NexGuard Vitals

Why choose NexGuard?

- Our customers have chosen us
  - All the major studios
  - Original content providers
  - PayTV providers
- Unfair advantage
  - **Our Looks/Imperceptibility** – validated by major Hollywood studios & PayTV operators
  - **Our Personality/Robustness** – proven against severe degradation of the content

NexGuard Solutions

Protecting the entire media lifecycle

- From birth
  - Pre-Release and e-Screener watermarking
- To going out in the world
  - Digital Cinema watermarking
- To old age
  - PayTV watermarking for both linear broadcast (STB) and digital streaming (OTT)

Protecting What's important

Looking out for your daughter

- Complete end to end security
    - CAS and DRM
    - Watermarking
    - Monitoring and Enforcement
- Protect content
- Find it when it leaks
- Trace it to whoever leaked it

Thank You

Looking forward to dating you and taking long walks on the beach!!!

Mark Nakano

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http://www.nexguard.com

@nexguard

MarkAny's Forensic Digital Watermark

Content TRACKER™
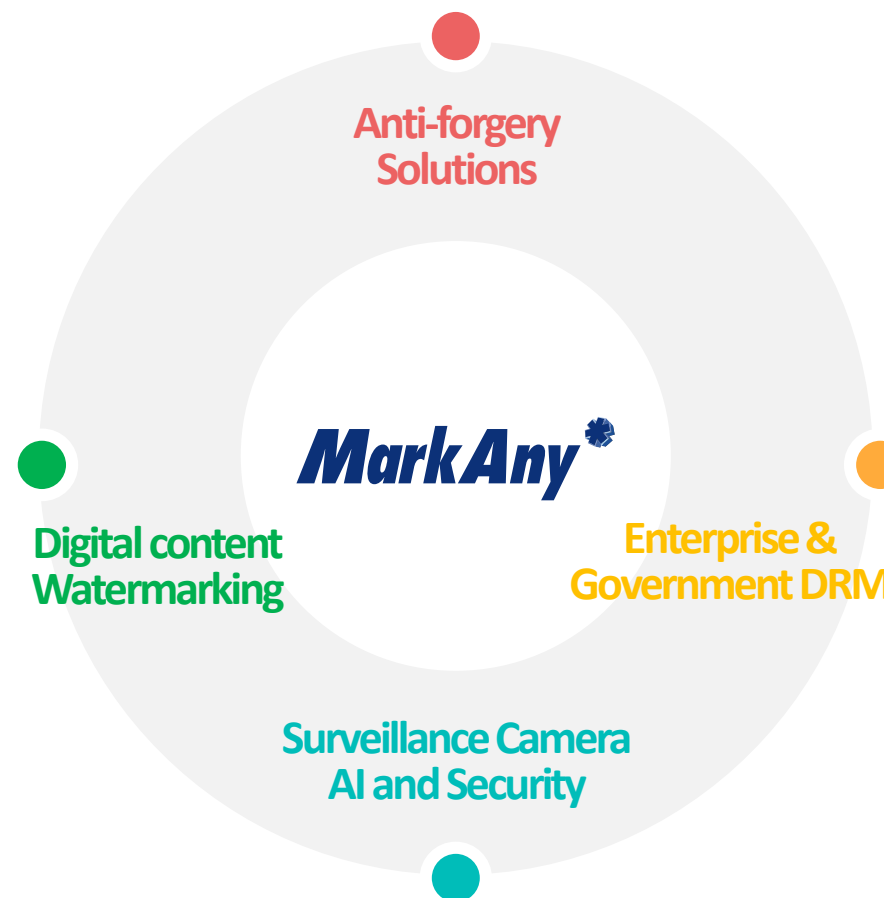
KEY WORDS Content TRACKER™

MarkAny

8K UHD

8K UHD Resolution Support

1 Trillion+

1 trillion+ sessions or users identification

Real Time

Real time embedding

Fast

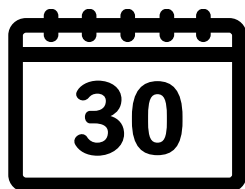Fast implementation and integration (1 month avg.)
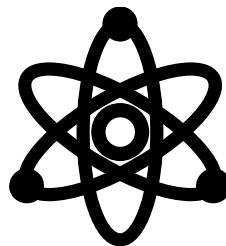
Robust

Industrial Standard Compliant

Customized

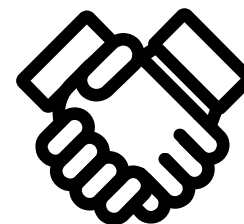Algorithm-based Customized solution tailored to each client's needs

KEY BENEFITS Content TRACKER™

**End-to-End Delivery
Lead Time**

**On-Demand
Detection Support**

SK broadband

SAMSUNG

LG U⁺

YANGAROO
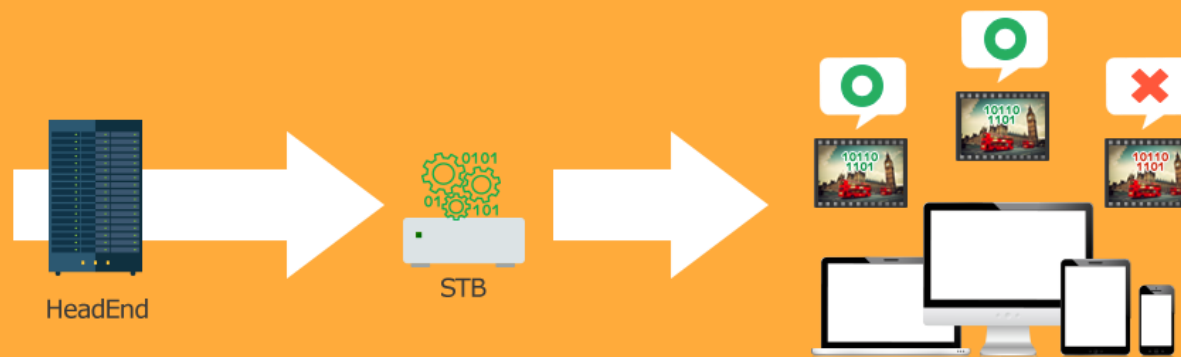
olleh kt

OverDrive

NAVER

And many more..

Thank You

Irdeto TraceMark™ Overview

Content Protection Summit
Marina Del Ray
December 7 2016

TraceMark™ preparation of original content in CMS

TraceMark™ insertion on the fly specific to each distributor

Watermarked content distributed to viewers
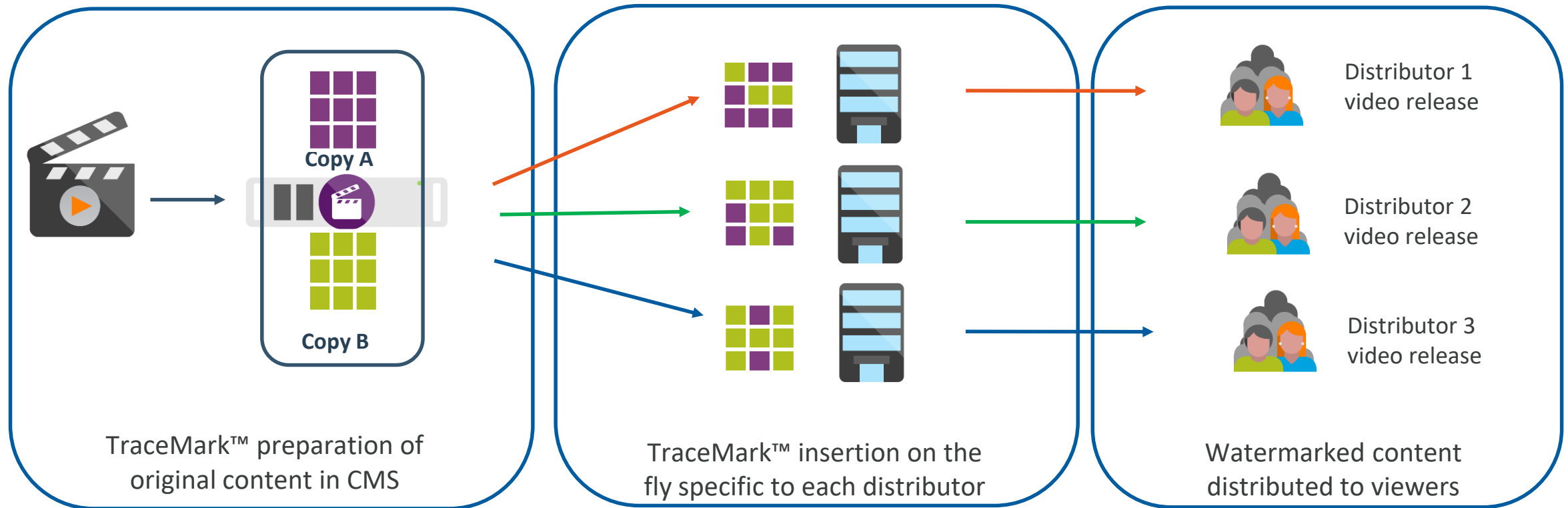
- Irdeto TraceMark™ forensic watermarking that is field proven

- **Distributor watermarking** seamlessly protects high quality content from content owner to distributor (pay TV, electronic sell-through, retail, etc.)

- TraceMark™ embeds an invisible, robust mark that uniquely identifies each stream

Irdeto provides a 360° View of Content

Irdeto Products

Irdeto Services

Secure Authoring House · Watermark Embedder (HD50 ProRes XDCAM) · Meta-data · Aspera · Watermark Switcher · Watermark DB · Distributors · Subscriber · Pirated Content

Pirate sites · Discovery · Analyze · Verify · Watermark Detector · Source Identification/Shut Down · Enforcement Activities · Reporting
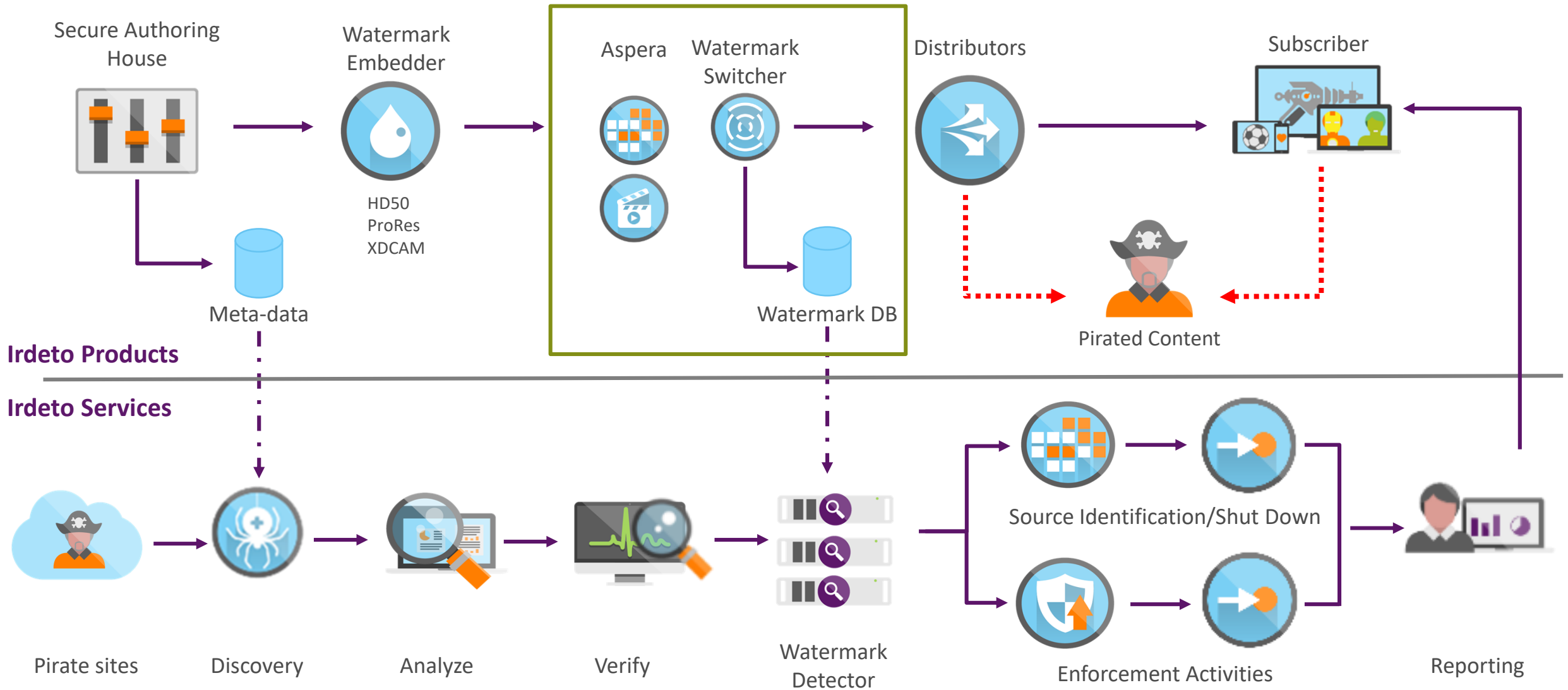
Verimatrix

Digital Watermarking

Niels Thorwirth, VP Advanced Technology

Expansive Global Protection

verimatrix

OPERATORS	SCREENS	COUNTRIES

850 OPERATORS
Protected by VCAS

110 MILLION
Protected by VCAS

110+ COUNTRIES
Deployed and supported

Company confidential.

Integrated Watermarking since 2005

MultiRights OTT

Verspective

VCAS Ultra

VCAS for
Broadcast Hybrid

VCAS for
DVB Hybrid

Verimatrix VideoMark®

Large footprint
- 2005 pioneering client side integration in STB
- today: HW SOC integration with 9+ SOC vendors

Secure
- Integration with decryption in TEE
  to comply with MovieLabs requirements

UHD / HDR and Live content
- Flexible optimization for requirements
  of extraction speed and highest quality

Verimatrix Solutions

Ease of Integration

- Verimatrix VideoMark® and StreamMark ® enable client and server embedding depending on network, delivery and client device

Full Circle

- Partners for monitoring and investigations

Company confidential.

Thank you.

MEDIA SCIENCE INTERNATIONAL

GLOBALLY TRACKABLE, SECURE CONTENT DISTRIBUTION AUDIO, VIDEO & IMAGE

Watermarked Digital Delivery

Watermarked OTT Screeners

studio**CDN**

bluscreen.tv

**GLOBALLY TRACKABLE,
SECURE CONTENT DISTRIBUTION
AUDIO, VIDEO & IMAGE**

Web Capio

**Track & Trace Monitoring, Source Detection,
Business Intelligence & Takedowns**

MEDIA SCIENCE INTERNATIONAL

Top 10 Link sites

Site	No. of links	Type
vodlocker.com	6,371	Stream
thevideo.me	5,283	Stream
openload.co	5,220	Stream
vidzi.tv	4,890	Stream
vidbull.com	4,565	Stream
uploaded.net	4,487	Download
rapidgator.net	4,304	Download
streamin.to	3,910	Stream
vidto.me	3,621	Stream
allmyvideos.net	3,294	Stream

Top 10 Host sites

Site	No. of links	Type
watchepisodes.co	20,951	Stream
watchseriesfree.to	19,226	Stream
the-watch-series.to	10,411	Stream
watchtvlinks.me	4,948	Stream
movie4u.club	4,828	Stream
scnsrc.me	3,846	Download
watchseries.ac	3,522	Stream
torrentroom.com	3,309	Download
2ddl.io	2,954	Download
primewire.ag	2468	Stream

Top 10 sites: site traffic

Site	No. of visits	US Rank
the-watch-series.to	60,800,000	1 (27%)
watchseries.ac	58,200,000	2 (25%)
primewire.ag	51,200,000	1 (48%)
watchseriesfree.to	6,700,000	1 (28%)
scnsrc.me	3,600,000	1 (24%)
2ddl.io	3,000,000	2 (19%)
torrentroom.com	850,800	1 (9%)
watchepisodes.co	260,000	1 (18%)
movie4u.club	182,000	1 (15%)
watchtvlinks.me	35,000	3 (15%)

Status of links (Up/Down)

- UP
- DOWN
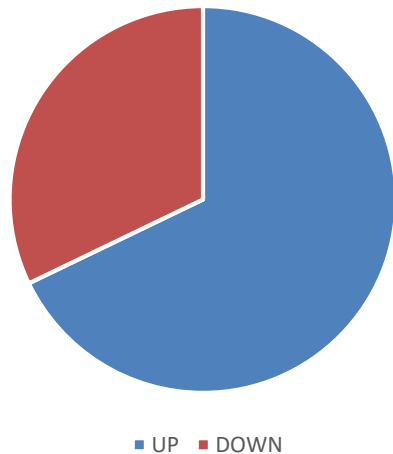
Top 25 Host sites
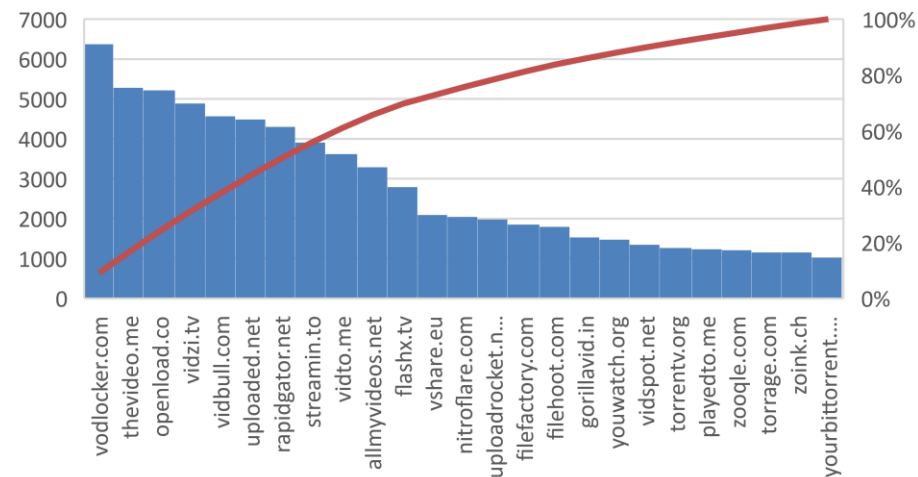
Top Referring Sites: ⓘ

- watch-series.to
- netflix.com
- thewatchseries.to
- putlocker.is
- gorillavid.in

the-watch-series.to

Top Destination Sites: ⓘ

- gorillavid.in
- data.explainidentifyco...
- vodlocker.com
- daclips.in
- movpod.in

See 995 More Referring Sites

See 995 More Destination Sites

SCALABLE SECURE CLOUD INFRASTUCTURE

- Encryption At Rest & During Transmission

- URL Protection: Media links lock to device

- Malware Scanning

- Adaptive Streaming to all devices

- Transactional Forensic Watermarks for ALL MEDIA FORMATS (Audio, Video, Images)

- Worldwide Performance Centers

- Personal Portal for Distribution and Monitoring

- Anti-Piracy Research Portal

- Active Directory Integration

- Full API Available

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MediaScienceInternational.com

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