The Case for an Action Plan:

Supporting an Open, Industry-standard Watermarking Solution

Executive Summary

June 2025

The biggest challenge in the digital transformation of television is achieving scale. Television has always been a scaled medium with universal reach, and we need to restore that scale. Interoperability is essential.

– Irwin Gotlieb

(former Chairman and CEO of GroupM)

CIMM set out to assess the value of an open, universal watermark system to improve measurement and activation – and the case for an industry action plan to support accelerated adoption

Introduction

- Today, the media and advertising industries face an urgent and important challenge: Cross-channel and cross-platform measurement doesn't support the optimization requirements of advertising and content with universal reach, frequency and time spent, because industry solutions are developed for disparate use cases and constituent concerns.
- Given this situation, CIMM commissioned a study to explore the potential benefits arising from widespread adoption of an open, universal watermarking standard to support improved measurement and activation tools, and to assess the case a coordinated industry action plan to facilitate accelerated roll out and to catalyze activity across disparate stakeholder groups.

Project hypothesis

An open and universal watermark standard would enable significant measurement and activation benefits across the industry – and a coordinated industry action plan would play a vital role in helping to realize these benefits.

The project has been highly consultative, involving stakeholders and subject matter experts from across the industry

Project inputs and scope

Industry engagement and consultation

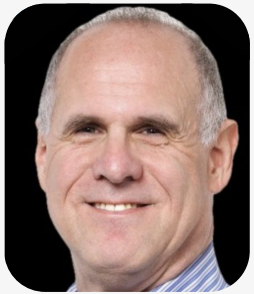
- Expert Advisory Group of 30 senior executives from buy- and sell-sides of industry.
- 40+ sessions with industry experts representing publishers, agencies, brands, tech platforms and OEMs.
- Survey to evaluate industry drivers/motivators and the importance of system capabilities.

Key research areas in the study

- Definitions and application of watermarks.
- Potential benefits of an open universal watermarking standard.
- Operation of a scheme in practice.
- Incentives, motivations, barriers of key stakeholders.
- The case for and practicalities of an industry action plan.

Key Contributors

- Authors - Caroline Horner, Howard Fiderer, Myles Parker
- Project Manager and lead Sponsor- CIMM
- Co-Sponsors - XR, VEIL



The US market would benefit from widespread adoption of open, universal watermarks to support improved measurement, and from the deployment of standardized activation triggers

Project conclusions

- Widespread adoption of an open, universal watermarking scheme, leveraging existing standards (e.g., ATSC 3.0, ACIF, AD-ID, VAST, SCTE 224), could help to deliver consistent, robust full-spectrum measurement of content and advertising across TV and streaming platforms, as well as standardized activation tools.
- The case for watermarked-tagged advertising is strongest, as deployment across multiple publishers would enable de-duplicated cross-platform and cross-publisher measurement – a vital priority for the industry, at relatively low cost.
- By contrast, although watermarking could offer considerable benefits for content measurement, establishing a robust commercial case for the near-term is more challenging, but could follow at a later date.
- There is an opportunity for content providers to also ultimately leverage open, universal watermarks to offer a standardized approach to activation – functionality defined as the insertion of targeted ads on an individual device, also known as addressable or dynamic ad insertion (DAI). Leveraging this capability will require investment, but could fundamentally improve the case for deployment.
- The next step is to establish a coordinated Industry Action Plan and a Stewardship Group to support implementation of a Proof of Concept test for advertising watermarks, to demonstrate the benefits and build industry support and alignment, and to design the central components of an action plan.

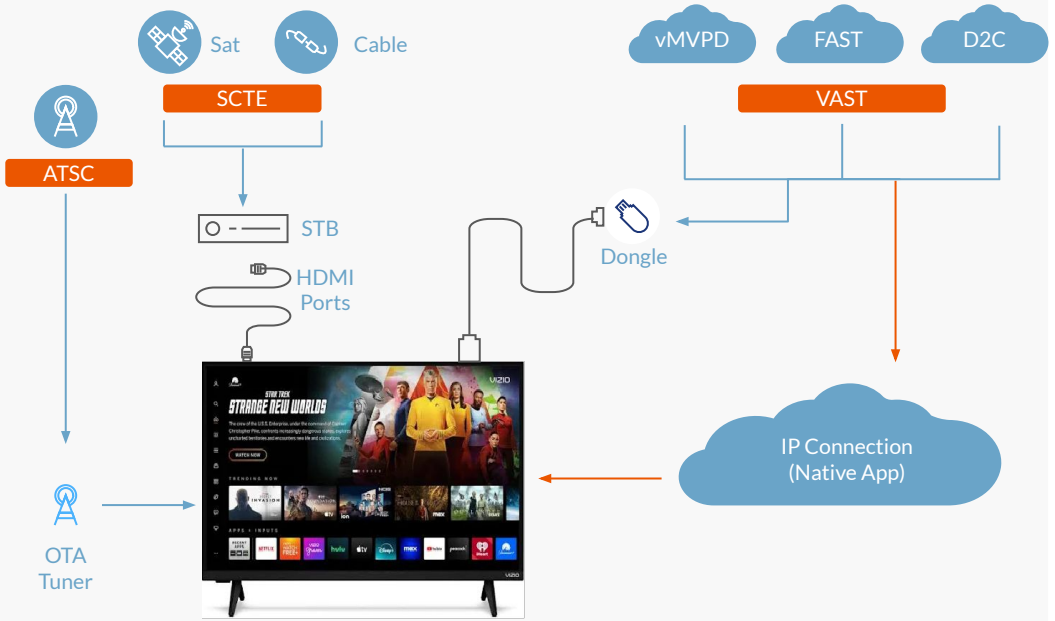
Let’s get into the details ….

Although measurement solutions are improving steadily, providing comprehensive advertising measurement of unduplicated reach and frequency is challenging in a multi-platform world

Advertisers want better measurement

- Inconsistencies in measurement approaches and gaps in the available data make campaign-wide measurement a significant challenge, especially across linear and streaming platforms.
- Walled gardens create “blind spots” where measurement data is not made available.
- Fragmentation without consistent measurement reduces the efficacy of advertisers’ efforts and creates waste, pushing some spend towards walled gardens.
- The problem will get worse as AI generated content and ads proliferate, leading to many versions of ads per campaign/platform.

Video content distribution paths



Note: Red arrows represent blind spots due to walled gardens

Successful deployment of a new watermark standard could help to address these challenges, delivering significant measurement and activation benefits

Watermarks - definition

- Watermarks are small codes put into video assets (content or ads) that can be decoded, recorded, and acted upon from devices such as panel meters, monitoring devices, mobile devices, and Smart TVs.
- These codes can be metadata, such as the name of the asset, or links to secure, centralized databases or repositories that contain instructions or more information.

Measurement benefits

- Watermarks provide consistent, tamper-resistant identification of content and ads across all distribution paths, addressing gaps that device-based systems may miss.
- Uniform measures with a universal and standard watermark reader that deliver more accuracy and higher quality than current methods.
- Embedding timing data and content identification directly into the media asset enhances granularity and accuracy, supports consistent data capture, and reduces reliance on probabilistic matching.
- Improved talent tracking and royalty management.
- Fraud prevention.

Activation benefits

- Activation can open new sources of revenue by expanding beyond passive audience measurement to enable new monetization and optimization opportunities.
- Watermarks can trigger addressable ad insertion, creative rotation, or content-specific actions across all distribution channels and delivery paths.
- Registries associated with the watermarks can carry more detailed information, enabling consistency with linear schedules in and around the break.

A new watermarking system could be developed by leveraging existing standards, including AD-ID, helping to keep costs low

Open Watermarking system building blocks

To succeed, any new watermarking system must leverage existing standards to maximize compatibility, reduce costs, and avoid conflicts with widely deployed solutions. Based on extensive technical evaluation, we recommend building the system on three foundational components:

Watermarks

Watermarks enable ad recognition "at the glass," providing the most accurate measurement and supporting activation. They also simplify integration with the diverse ACR systems used by CTV OEMs. The only open watermark standards available today – vATSC A334 (Audio) and A335 (Video) – were developed under the ATSC 3.0/NextGen TV initiatives but are not limited to that ecosystem. They can be applied across CTVs, set-top boxes (both traditional and streaming), and popular streaming apps. Currently, LG, Hisense, and TCL have deployed watermark readers in the field, enabling near-term testing and proof-of-concept work.

Ad Identity (AD-ID)

The IAB Tech Lab's Ad Creative Identity Framework (ACIF) is the global standard for ad identity. In the US, AD-ID – developed by the ANA and 4A's – is the preferred solution and already broadly adopted across the industry.

Ad Serving Standards

Standards such as SCTE 224 and VAST should be used alongside watermarks to ensure alignment and consistency across linear and digital ad delivery systems.

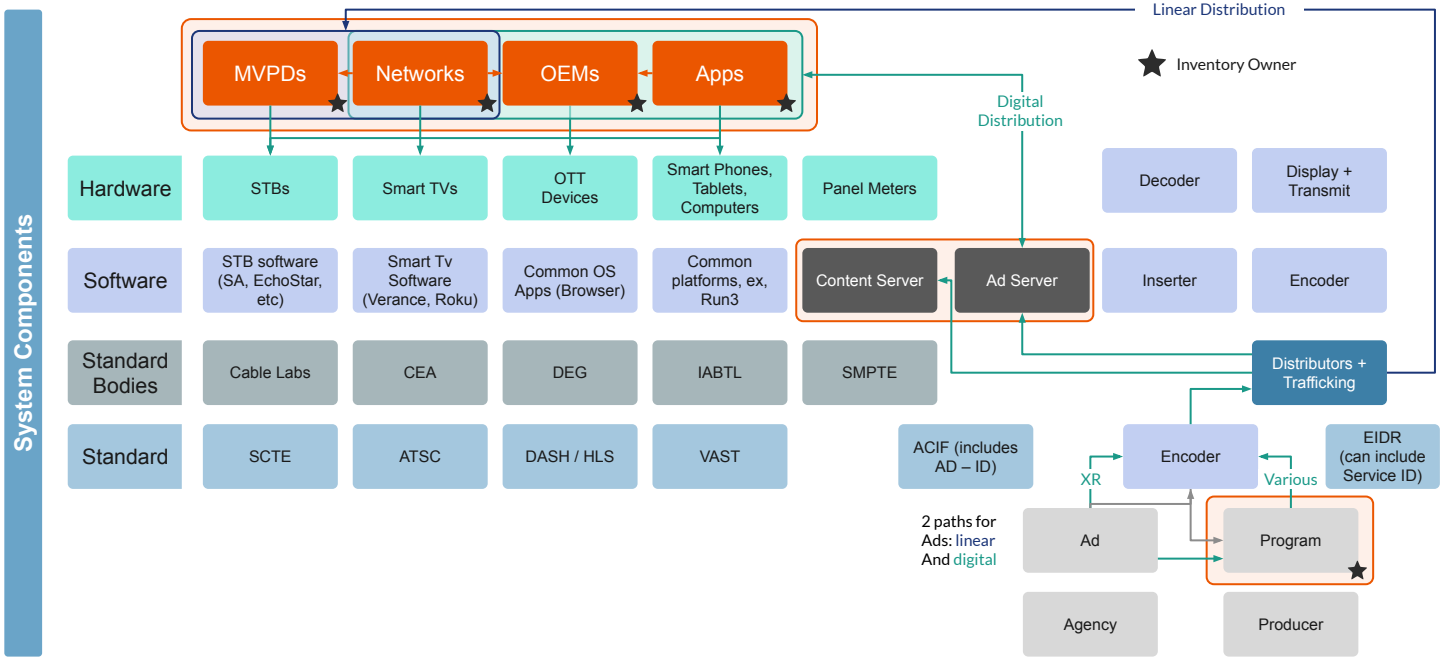
The new watermarking scheme would be complementary to existing CTV ACR solutions, focusing on counting individual ad exposures

Compatibility with ACR systems

- Currently, most CTV OEMs have ACR systems in their middleware that rely on fingerprinting technology and reference libraries. These systems have become vitally important building blocks for syndicated measurement solutions, with many OEMs licensing data out to measurement vendors to incorporate into their products.
- However, these datasets are not complete and do not provide the level of granularity desired by advertisers. Also, many major streaming services insist on “Do Not Monitor” clauses in their distribution contracts with CTV OEMs, which seek to limit access to measuring their viewership data.
- There is a strong case to be made that AD-ID embedded in watermarks, enhancing the recognition of ad creatives, would offer more precise and deterministic counts, enhancing existing systems, especially as the market prepares for an influx of AI-driven creatives and other expanded functionalities.
- Moreover, watermarking can help to navigate “Do Not Monitor” agreements by focusing solely on watermarking the ads, rather than trying to provide insights into audiences or content, and by providing direct support for all devices and apps to be permissioned and to read the embedded watermarks. This approach is intended to facilitate the positive and inclusive evolution of an open and competitive measurement marketplace.

Indeed, any future watermarking system should work with the many existing data generation techniques created by various distribution channels

Measurement triggers and associated standards by distribution channel



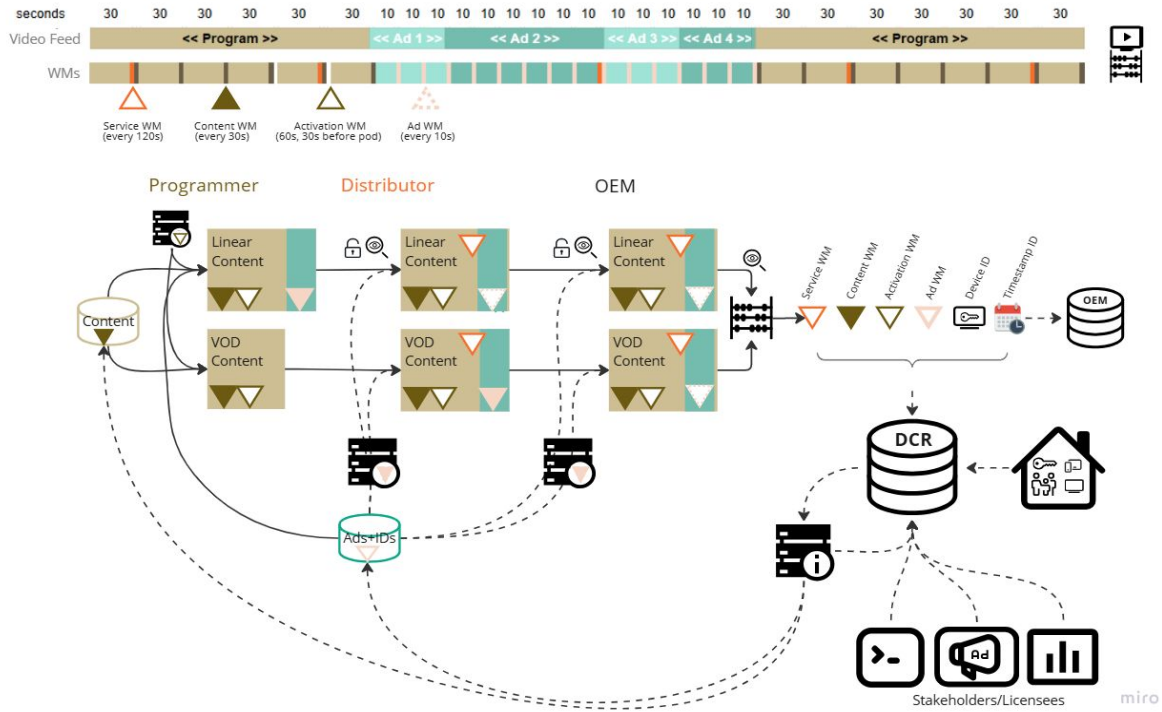
A future watermarking solution will need to work with the many different data generation techniques for cross-platform measurement and activation, requiring coordination across various standards bodies to help streamline requirements.

These data generation techniques include:

- Watermarks
- Fingerprints
- Signaling Cues
- Tags
- Log files, Beacons, Pixels

While complementary to existing infrastructure, a new watermarking scheme will also require some new system components, including ID registries, repositories, watermark types, readers and event data

Watermarking scheme - infrastructure



Key components:

- Unique ID Registries
- Repositories
- Watermark Types
- Access Controls
- Watermark Readers
- Event Data
- Identity Resolution
- Data Cleanroom

For illustration only, actual system to be developed by Stewardship Group

An industry-wide standard watermarking solution would deliver potential financial returns across the ecosystem

Financial benefits

Area	Description	Key beneficiaries
Improved ad campaign effectiveness	A comprehensive watermarking system would enable consistent cross-platform and cross-media measurement. This unified data framework would support granular analysis of campaign performance by linking exposure to key success metrics such as conversions. It would also facilitate both offline and in-flight optimization through advanced techniques such as data-driven targeting and precise reach and frequency management. See next slide for more detail.	Advertisers
Fraud prevention	Watermarks and associated metadata can be encrypted to prevent unauthorized access or misuse. Additionally, data derived from content-based watermarks can be transmitted alongside the ad creative watermark to the reporting system, providing an added layer of validation and security.	OEMs, Programmers, Advertisers
Activation	Activation signals can be embedded directly in content and detected by endpoints such as Smart TVs. Unlike SCTE-35 markers, activation watermarks persist through the encoding processes used by broadcast affiliates. These WMs also offer added value by linking to ad inventory metadata that is unavailable in current systems.	OEMs, Programmers
Expanded reach	Enabling activation will unlock addressable advertising in currently unsupported inventory like broadcast and national cable, overcoming affiliate cueing issues—but success depends on footprint penetration, as limited reach hinders ad sales.	OEMs, Programmers
Better measurement granularity	By capturing measurements at ad entry and exit, and embedding watermarks at one-second intervals, significantly greater granularity can be achieved compared to the traditional quartile-based measurement used in streaming.	OEMs, Programmers, Advertisers
Cost savings	OEMs can achieve significant cost savings over traditional ACR fingerprinting and set-top-box reporting. Time-stamped watermarks allow devices to calculate dwell time locally, reducing the need for high-frequency data transmission while meeting advertisers' granularity requirements. As adoption scales, OEMs will further lower costs by relying less on resource-intensive fingerprinting systems. Programmers and advertisers also benefit from a consistent, single-source data stream that minimizes aggregation and reconciliation, reducing processing and analytics costs.	OEMs, Programmers, Advertisers

Higher average ad campaign returns (ROAS) would be a particularly important outcome of a new watermarking system

Return on Ad Spend (ROAS) drivers

Reach and Frequency Management

Identifies overexposure and redirects media spend toward underexposed audiences. This reallocation reduces waste and allows advertisers to achieve greater reach within target segments.

Conversion-Linked Optimization

Integrates with identity systems to connect ad exposure to conversions, improving attribution and enabling smarter allocation of budget to the channels that perform best.

Data-Driven Campaign Refinement

Enables consistent analysis across media types, allowing advertisers to fine-tune campaign parameters for higher effectiveness, stronger performance, and reduced inefficiencies.

Creative Asset Efficiency

Tracks creative utilization through AD-ID, identifying underused assets that can be repurposed - lowering production costs while maximizing the value of existing creative investments.

Future Creative Insights

Opens the door to measuring engagement at specific points within ads, providing feedback for optimizing creative elements that drive stronger consumer response.

However, different stakeholders in the industry would face varying incentives, requiring alignment and negotiation

Stakeholder motivations and benefits

Stakeholder	Key Benefits	Monetary Incentives	Impact
Advertisers & Agencies	Advertisers and agencies benefit from more accurate attribution and targeting, enabling them to improve return on ad spend. They gain better control over reach and frequency, reduce wasted impressions, and can track creative utilization to repurpose underused assets.	These improvements translate into higher media efficiency, reduced cost per conversion, and more strategic allocation of advertising budgets.	
OEMs (Smart TV Makers)	For OEMs, watermarking complements existing ACR solutions and serves as a platform for future capabilities such as granular measurement and ad activation. It supports interoperability with industry standards and strengthens their role in the ad ecosystem.	OEMs stand to generate new revenue through more widespread use of their measurement data (more media types) as well as new ad serving fees through activation. Better measurement will deepen advertiser relationships which could lead to greater ad spend across FAST channels.	
Programmers	Programmers benefit from a unified and consistent signal across distribution platforms, enabling more timely and accurate data for advertisers. This supports advanced advertising models, including addressable linear and cross-platform measurement.	The resulting business impact includes increased inventory sell-through, the potential for higher CPMs, and reduced operational costs associated with disparate reporting systems.	

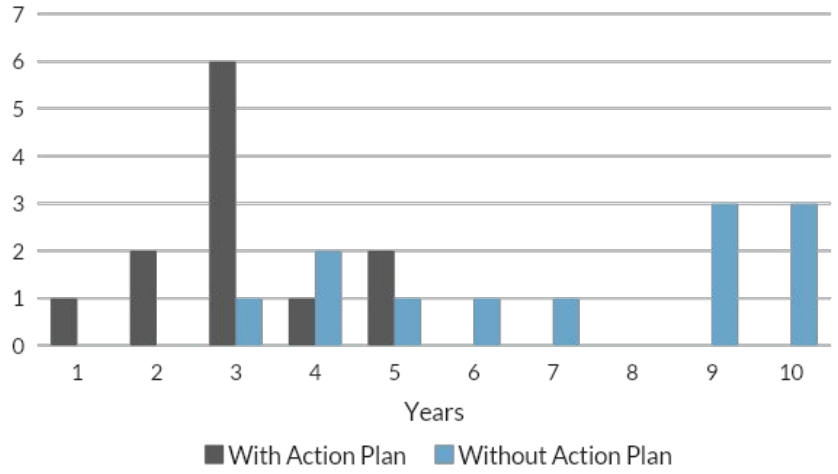
Success will likely require collaboration and collective action across diverse stakeholder groups

The case for an Industry Action Plan

- There is widespread belief among industry executives that a coordinated approach to developing an open, universal watermarking scheme would drive success in a 1-3 year timeframe.
- Progress without a coordinated approach is unlikely, given the market is large and complex, with weak leadership institutions (such as government regulatory bodies) relative to other countries.
- Previous industry watermarking standardization efforts – such as Project OAR – demonstrated that a lack of comprehensive upfront planning and coordination led to disjointed approaches and low adoption.
- OEM and technology provider participation in particular are essential – if these vendors are not part of the process and decide to build their own systems, the results may be proprietary or at least suboptimal.

Executive Views on Importance of Industry Coordination

Q. Assuming that technological, operational and/or commercial barriers can be resolved, how long do you think it would take to see mass adoption of an open, universal watermarking for measurement – with and without a coordinated action plan?



Source: Industry executive survey, Q4 2025

The next step is to create a Stewardship Group to oversee a Proof of Concept and the development of a coordinated Industry Action Plan

Foundations of an Industry Action Plan

1. Establish a Stewardship Group to set overall vision, support design of key components, drive technical decisions, align stakeholders, coordinate implementation, drive adoption, and oversee a POC.
2. Focus initially on the benefits for advertising measurement, with activation and content measurement to be addressed in later phases.
3. Design a shared system of IDs, registries, repositories, file formats, privacy and controlled data transfer protocols.
4. Document the required workflows required to support roll out.
5. Support the design and implementation of a Proof of Concept (POC), ideally including at least two OEMs. This effort should focus on the technical design and validation efforts of a POC, including development of watermark readers, design of the incentive model, and preparation for deployment across the industry.

Longer term, implementation should be organized into three broad phases, each offering incremental value for the industry

Phase 1: Advertising Measurement
(1-2 years)

Delivering a full scale measurement system for advertising and content should be the initial goal

- The operational workflow for watermarking ads for measurement is less complex than content.
- Advertising does not evoke the requirements for content opacity.
- Advertising measurement does not compete with ACR solutions.
- Advertisers can provide needed incentives with spending decisions.

Phase 2: Activation
(2-3 years)

Activation watermarks, which insert avail signaling into content, enables revenue optimization opportunities across platforms for all downstream distributors

- Advertisers can have better campaign control of cross platform campaigns than is available today.
- There is significant revenue that can be achieved by extending the addressable footprint.
- The system can build on the backend systems (e.g, repositories) that are built for ad measurement.

Phase 3: Content Measurement
(3-5 years)

Content measurement would be useful to both content providers and talent

- Granular measurement can help in content design and production.
- Talent could benefit from better measurement for compensation purposes.
- Many of the systems built in the first and second phases of the initiative can be augmented leveraging industry databases (e.g. EIDR) to produce a comprehensive service.

Phases underpinned by a robust system designed during the early stages of any action plan

The successful development of an open, universal watermarking system will depend on wide, cross-industry stakeholder input

Getting involved

- A new Stewardship Group is needed to set overall vision, support design of key components, drive technical decisions, align stakeholders, coordinate implementation, drive adoption, and oversee a POC.
- To get involved, please email info@cimm-us.org (using subject line ‘Watermarking Stewardship Group”)

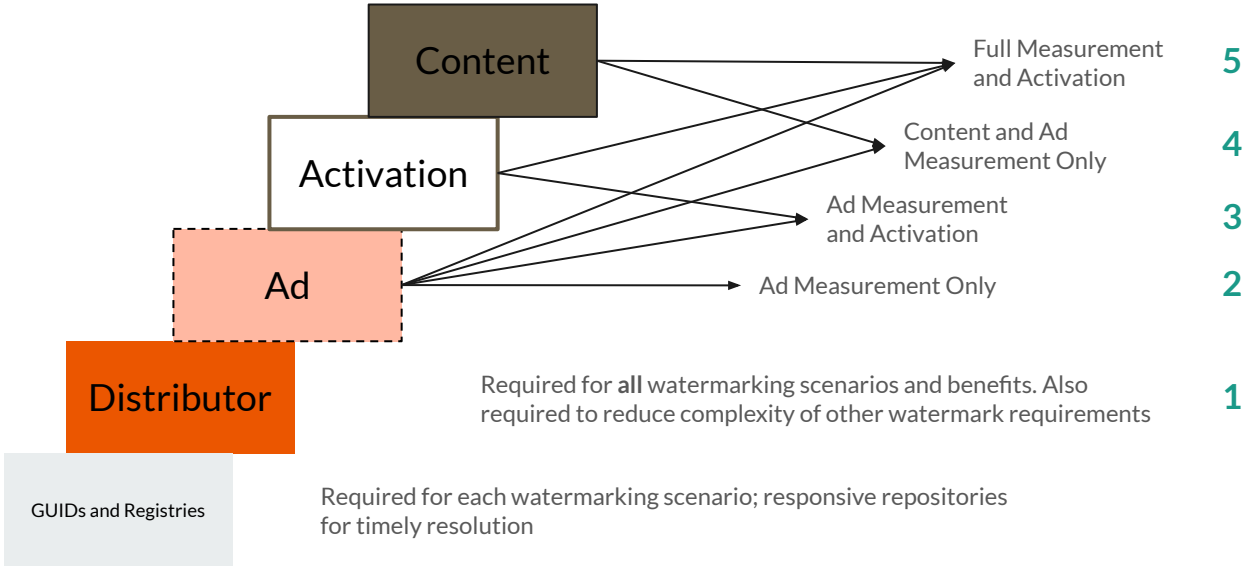
cimm

Thank you

Appendix

There are up to four different watermark types that can be used in various combinations - an ideal industry solution would embrace them all

Watermark types



Combinations

Full Measurement and Activation	5
Content and Ad Measurement Only	4
Ad Measurement and Activation	3
Ad Measurement Only	2
Required for **all** watermarking scenarios and benefits. Also required to reduce complexity of other watermark requirements	1

Required for each watermarking scenario; responsive repositories for timely resolution

Primary benefit

Content: Accurately and uniformly identify what is on the screen. Improve planning and talent management

Activation: Signal the permission to replace upcoming ads, improve contextual controls for brands, optimize yield across partnerships

Ad: Accurately count creative versions, dedupe for reach and frequency, equivalize duration based impressions

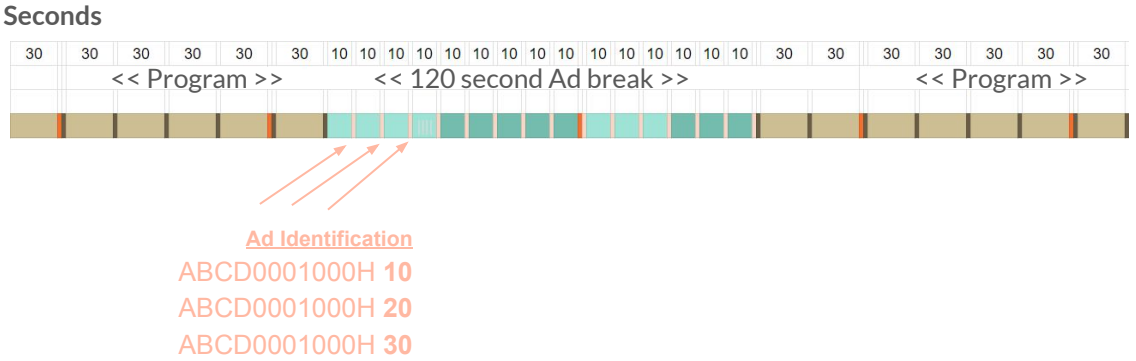
Distributor: Correctly credit the distributor and service provider. Improve ACR and STB data products

GUIDs and Registries: Standardize data for accuracy, interoperability, and efficiency

Delivering robust measurement capabilities requires frequent watermark delivery

Watermark delivery

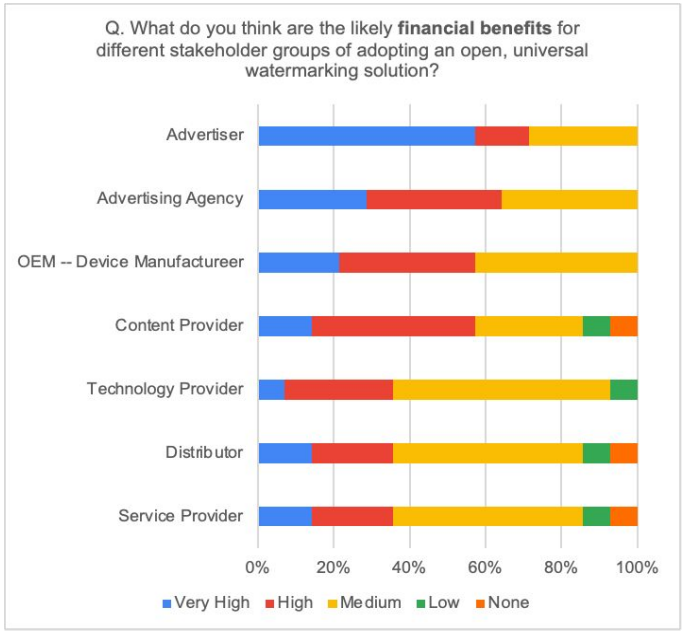
- Advertisers and content providers desire measurement that includes when the viewer begins a session, when they leave and the duration of the view (dwell time)
- The granularity of the measurement drives the frequency of the watermark insertion and its content
  - To get second by second measurement for ads it is advisable to have watermarks at least every second **with the offset** from the start of the ad
  - Content measurement may not need this level of granularity



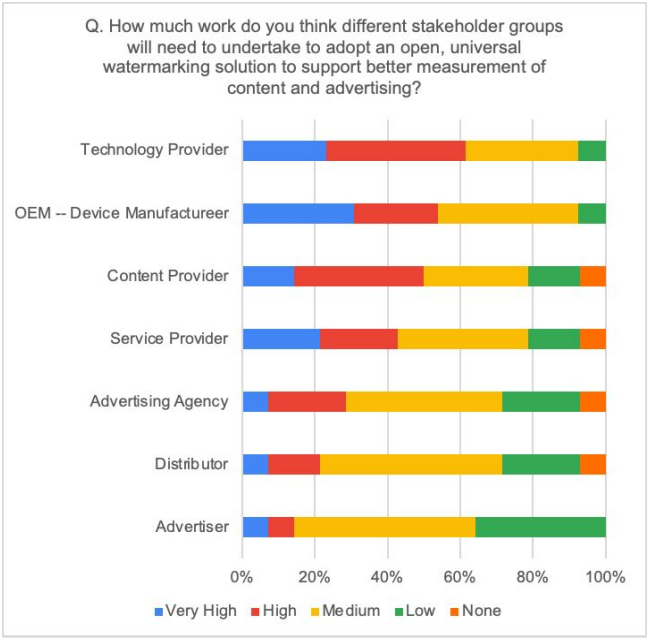
Note: These cadences are for illustration purposes. The actual timing should be driven by market requirements and the resultant architecture and system design. Watermark payload design should be minimal and refer to the repositories..

Stakeholders costs and benefits are not aligned

Advertisers and agencies have the most to gain

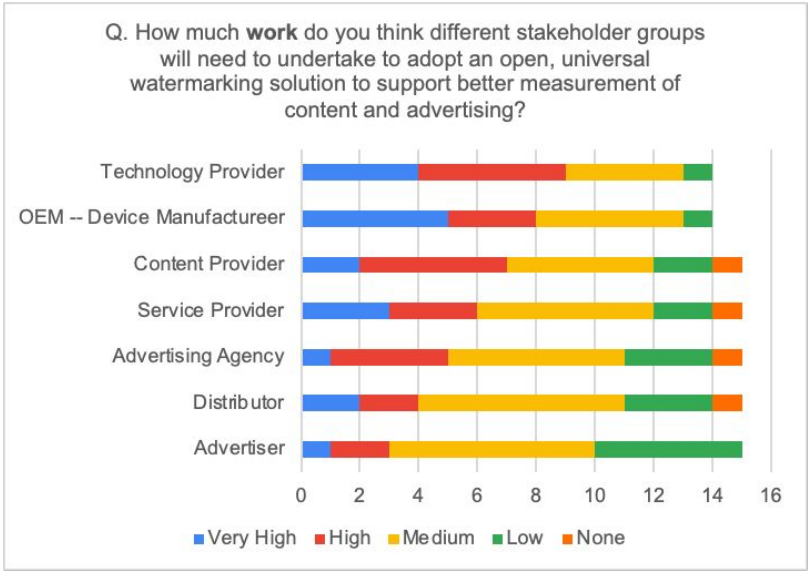


OEMs and the supply side are expected to carry the burden

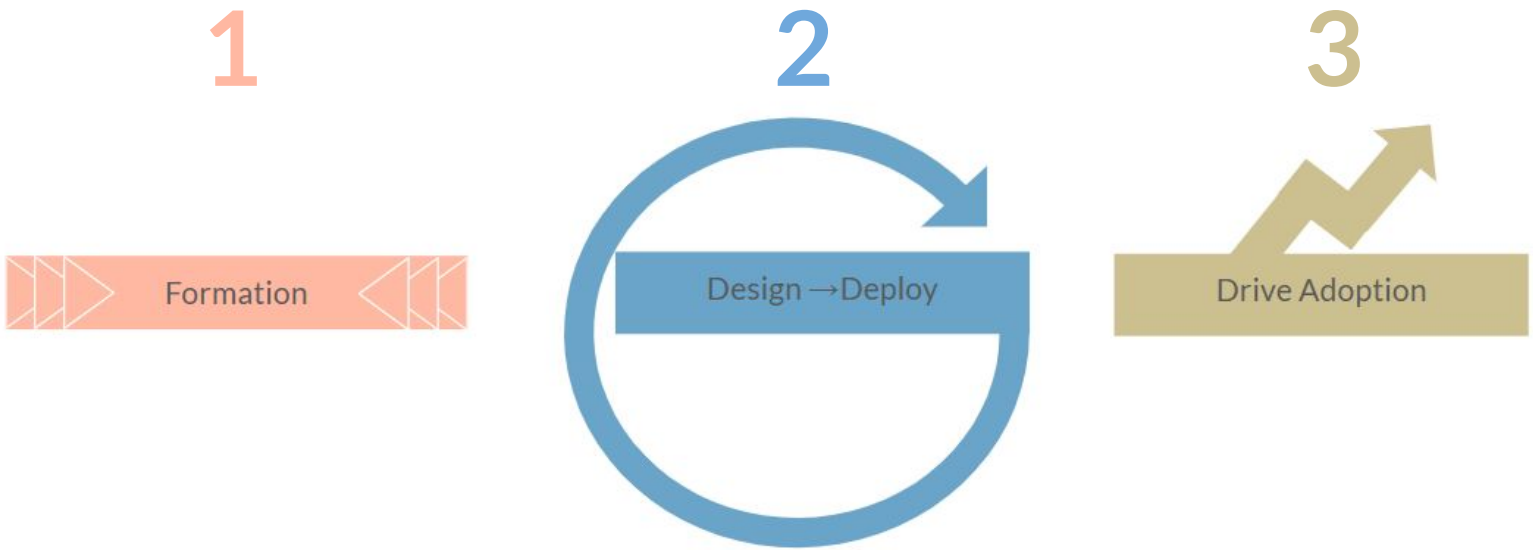


Past failures were largely due to non-collaboration and follow-through

- Building a successful system will need cross industry cooperation - no one standards body can fulfill the mandate
- OEM and Technology Provider participation will be critical but left alone, the results may be proprietary or at least suboptimal
- This initiative is likely to takes several years to reach its full potential and will need sustained effort
- Lessons can be learned from attempts made by Sorenson and OAR



We envisage a three-phased process for stewardship



Establish a strong foundation to help ensure success

FORMATION

STEWARDSHIP GROUP

- Appoint a representative team
- Establish stakeholder roles and responsibilities
- Define goals and objectives of the group

DEVELOP VISION

- Define initiative's overarching goals
- Select priority use cases
- Conduct market research to validate vision

HYPOTHETICAL BIG BLOCK DESIGN

- Create a high-level design overview
- Evaluate feasibility and cost implications
- Prepare a discussion framework for stakeholders

FINANCIAL MODEL & DEVELOPMENT PATH

- Estimate potential market size and revenue
- Identify funding models (e.g., centralized, outsourced)
- Evaluate cost and timeline for each approach

IMPLEMENTATION PLAN

- Outline phases and deliverables
- Assign participant responsibilities
- Prepare a promotional and engagement strategy

Encourage cooperation to foster adoption

Design -> Deploy

PROJECT TEAM

- Select to be involved in the initiative.
- Work with the relevant standards bodies (ADID, IABTL, ATSC, etc)
- Secure development partners

SYSTEM ARCHITECTURE

- Define operational characteristics of each component
- Define access methods and data flows including rights and protections
- Secure implementation partners

ROADMAP/TIMELINE

- Select milestones with tangible value
- Prioritize deliveries to provide the greatest value in as short a period as possible (e.g., focus on linear and OEMs)
- Socialize/publish milestone schedule among stakeholders

MARKET ENTRY

- Develop, test, and trial an MVP of the first use case
- Establish a beachhead of viewership/devices (e.g., a top tier OEM and linear)
- Expand capabilities and penetration of this use case

EXPANSION

- Continue to enhance the first use case
- Roll out to a greater set of devices/applications
- Move through use cases

Build on early success to drive growth

Drive Adoption

Concurrent

ORCHESTRATE SCALE

- Develop a partnership program to expand participation
- Onboard participants incrementally.
- Prioritize voting board members, CIMM members, and entities with the greatest scale.

SUPPORT SERVICES

- Build SDKs and documentation to ease implementation
- Offer technical support/expert guidance to adopters
- Deliver best practices guidance to ensure consistency of operation

PROMOTION

- Continue to drive initiative with market leaders
- Speak at industry forums
- Publish impact reports including tangible metrics

TRANSITION STEWARDSHIP

- Develop transition plan to a standards body or group of stakeholders to maintain the system design and ensure continued progress
- Transition from a management position to advisors