

A blue-tinted photograph of a person's head in profile, shouting with their mouth wide open into a large, professional studio microphone. The microphone is mounted on a stand and has a pop filter. The background is a solid blue color.

**M+E**

**JOURNAL**

Today's localization challenges are enormous. The opportunities are unprecedented. Is the industry ready for the mayhem?

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# Giving Voice to Chaos

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## P. 20 Optimize Localization by Introducing Machine Translation During Production

There are not enough linguistic professionals to keep up with the insatiable demand for localized content. By introducing AI-powered machine translation earlier during production and post-production, media companies benefit from economies of scale, a seamless post-edit process, and better creative outcomes.

By Janice Pearson @ XL8

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Not likely.

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# FROM CHAOS COMES COMMUNITY

By Guy Finley, President, MESA



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No one could have predicted how this decade has unfolded. And we aren't even a quarter of the way there.

At the beginning of 2020 I was excited for the MESA Europe community to join the global MESA brand and integrate their meetings and mission into the broader association ecosystem. I knew a cornerstone of their community was the Content Localisation Council (and apologies, Europe, for all the z's you'll need to endure through this issue) which had been thriving out of London since 2016. They had been producing the premier localization event for media and entertainment (Content Workflow Management Forum) and that event helped introduce innovation and transformation to a growing community of passionate service providers. The Council was the perfect "vessel" to bring a group of technologists (customers, partners, and competitors) in front of decision makers and peers to demonstrate where our industry can go when faced with a common challenge. Working group sessions drive an open forum, no press event to accelerate efficiencies in the entertainment supply chain. The community mantra for MESA and what we are founded on. Easy. Win-Win.

## THEN CAME CHAOS

The pandemic hit. The Ides of March 2020 started a two-month lockdown. But we didn't stop working ... ours is the industry the world turns to in crisis. We needed to entertain! And never mind the fact that the streaming wars had begun which drove an already insatiable appetite for content into the stratosphere. We didn't slow down, we sped up. The entire work-from-home strategy for localization companies had to be reinvented and we had incredible challenges at the front end of the content supply chain. We couldn't stop for two days, let alone

*IF WE'VE LEARNED ANYTHING over the past 24 months, it's that we can't (and won't) stop. We need to use our community platform to be unrelenting in our approach to collaboration.*

two months, when it comes to production, location, and talent scheduling! And WFH/cloud/platform adoption (revolution) only complicated matters. And that was only 2020!

And the localization segment only mirrors the disruption across every facet of production and distribution. '21 and '22 saw everyone doubling down on strategies that sometimes seemed upside down and unoriginal. Ours has never been a business where we could pour billions of dollars into a "format" with no understanding of the true payoff. Hollywood mirrored Tech in fighting for market share and subscriber base which harkened back to the cable/satellite days while we struggle to find a true solution to windowing that retains theatrical as an experience. Things are tough all over!

What a long, strange trip it's been, and we aren't out of the woods yet. Our world has been rocked by almost three years of uncertainty. Everywhere we turn and in the simplest things there's chaos. Personal, political, business, family ... everything is impacted by the "COVID cray." But as we get through the final stages of the pandemic, and frankly the far less scary or worrisome parts, we need to look back at what we've gained during these troubled times while respecting and mourning what we've lost. And it's in these moments, the small triumphs, and tragedies in our lives, that we turn to community. Through good and bad the community is

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MESA is a community dedicated to shaping the media and entertainment industry's future. MESA's 150-plus members and content advisors collaborate to advance change management, new workflow solutions, and production/supply chain efficiencies. Launched in 2008 as Media & Entertainment Services Alliance, MESA produces quarterly events (in-person and hybrid), daily email newsletters, webinars, and the M&E Journal on behalf of its members. MESA is the management company responsible for the community efforts of Media & Entertainment Data Center Alliance (MEDCA), Hollywood IT Society (HITS), Smart Content Council, and Women in Technology: Hollywood (WiTH), as well as the business operations of the Content Delivery & Security Association (CDSA), the Entertainment ID Registry (EIDR) and the WiTH Foundation.

For more information, visit [mesaonline.org](http://mesaonline.org)

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# CHANGE IS THE ONE CONSTANT IN LOCALIZATION

By Caroline Baines, Senior Director, Client Services, MESA



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As I reflect on the last 12 months, I think it's true to say that change became the watchword for 2022. As the world emerged from the pandemic, we have seen the media and entertainment landscape witness a significant shift in direction, one unlikely to be reversed.

The new normal is no longer new, it is just normal. Hybrid working and greater reliance on video conferencing rather than traveling are now accepted by most organizations. Productivity is not being impacted and, in many cases, has increased.

And just as we have changed as employees we have also changed as consumers. Buying online was already well established, but the explosion in e-commerce during the pandemic is also here to stay, as are our changing viewing habits.

Our appetite for content shows no sign of abating, creating huge pressures on every aspect of the content supply chain. The constant launch of new streaming services across the globe means the localization industry is busier than it has ever been. The talent crunch is a phrase that has been well-used during 2022, along with capacity shortages and stories of dubbing studios being booked 6-9 months in advance. For an industry that often needs to work on a "just in time" basis, such issues are proving to be incredibly challenging and seem set to continue into 2023.

This increased demand for content has elevated the localization industry and created many new opportunities, such as English dubs, which would have been a rare ask just a couple of years ago. Market demand is also growing in countries such as India, with more and more languages being required, which is putting increased strain on the industry to fulfill these requirements.

While this increased demand is placing challenges on the localization sector it is putting it center stage. The theme of localization was more evident at IBC than

*THIS INCREASED DEMAND for content has elevated the localization industry and created many new opportunities, such as English dubs, which would have been a rare ask just a couple of years ago.*

it has ever been, and the Cloud Localisation Blueprint was a highlight.

The localization industry remains a core focus for MESA with the Content Localisation Council resuming in-person meetings at the end of 2021. Our most recent meeting was in October, hosted by Warner Bros. Discovery. This hybrid and in-person meeting saw close to 50 localization executives coming together to discuss several key issues, including the importance of diversity and inclusion and the role that technology plays within this sector.

Localization chairs Justin Walton, head of global content operations at ITV and Jan- Hendrik Hein, VP of media operations EMEA at A+E Networks, support us from the content owner side, while Nicky McBride, global business development and client relationships for Iyuno and Carlo Decianti, head of sales for Plint support from a vendor perspective. Having their combined expertise is invaluable at our meetings and in helping shape our events.

At the recent meeting, Nicky and Carlo provided their views on IBC for those unable to attend. They highlighted the increased focus localization played at this year's event and the fact that several freelance subtitlers were in attendance. Some of the key themes included the need for

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# THE INVISIBLE THREAT TO M&E TECHNOLOGY

By Eric Rigney, Vice President, MEDCA

What does the data industry know about filmmaking or broadcast?

No matter how cost effective the technology, whether a virtual production, SMPTE 2110, or even any of today's common digital equipment, processes, and workflows — whether supporting film, television, broadcast, or live events — data is the common denominator and all data travels over a physical foundation.

While every digital box and highway are internationally required to follow data industry standards, when it comes to the design, building, and maintenance of data's foundational layer, the entity that purchases the hardware, software, and plugs everything together, is not obligated to know or implement the data industry standards developed to support the purchaser. The disconnect between user and data industry standards in supporting the user's digital infrastructure is the threat currently invisible to media and entertainment (M&E).

Digital infrastructure is not governed by audio-visual (AV) standards bodies such as the Society of Motion Picture and Television Engineers (SMPTE) and the Audio Engineering Society (AES). A facility's or service operation's digital infrastructure standards are governed by relevant data industry boards like Telecommunications Industry Association (TIA), Institute of Electrical and Electronics Engineers (IEEE), International Organization for Standardization (ISO) and more.

Relying on an information technology (IT) department or AV engineer to design and build a facility's digital infrastructure or portable micro data center such as a DIT cart or virtual production server rack, demonstrates M&E's lack of awareness as to the extent to which it has entered the data industry's realm of expertise and 100 years of experience. Every digital hardware and software component driving media and entertainment, pre-production, production, postproduction, and broadcast processes are built to meet or exceed data industry standards. Every commercial carrier that connects one studio, service provider, or production to another follows data



industry standards. It's up to every facility and service provider to voluntarily elect to implement data industry infrastructure standards as they apply to their circumstance. Applying well established data infrastructure standards is a choice, not a requirement for any M&E operation.

## COST OF NON-COMPLIANCE

The lack of awareness, experience, and execution of data industry standards in M&E drives up costs: cost to productions, cost to service providers, and cost to manufacturers. Each vertical spends countless hours trouble-shooting problems that are often self-inflicted by M&E's lack of data infrastructure standards education and implementation. Habit and misguided reliance on standards developed outside the realm of the data industry is in large part to blame. For decades, M&E has successfully relied on audio-visual (AV) engineers and information technology (IT) technicians to design, build, and support its digital operations, delivering high quality digital media on time and on budget.

But digital demands are flooding M&E spaces. Currently AV engineers and IT specialists do not normally have the necessary background to design and build



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digital infrastructure, the physical layer that supports all digital processes. The Open Systems Interconnection (OSI) model used by the data industry to build the Internet and most all things data related breaks digital workflows into 7 layers. Layer 1 is the physical, or foundational layer. Layer 1, the Physical Layer, is not the realm of AV engineers or IT techs. Customers work in the Application layer, Layer 7. AV might work between Layers 4 and 7. Relying on AV engineers to set and test AV equipment is a round peg in a round hole. IT technicians, depending on their expertise, might work between Layers 3-5. Relying on IT technicians to set and test digital communication parameters is also a round peg in a round hole. M&E's reliance on AV engineers and IT technicians to design and build their digital infrastructure is a round peg in a square hole. It's worth noting that neither are digital product manufacturers of hardware and software solutions likely able to determine whether a user's infrastructure meets appropriate data industry Layer 1 standards. Layer 1 is not a manufacturer's OSI layer. OSI Layer 1 expertise uniquely rests with digital architects grounded in the standards developed by the data industry and other related boards' responsible for developing digital infrastructure standards.

With the invisible threat of non-compliance comes invisible costs. Non-compliant operations are more likely to experience poor performance, less security, and greater frustration. What does non-compliance feel like? Slower processing and render times, slower downloads and uploads, difficulty making and keeping reliable connections both wired and wireless, greater latency, file corruptions, micro brownouts, greater consumption of power and heating/cooling, and sometimes, just getting "it" to work. Down-time is the greatest cost. With the per minute total production cost to produce a scene on a virtual production volumetric stage ranging on average from \$9,000-\$16,000, excluding talent, how valuable is digital performance?

Studios, facilities, vendors, and service providers that design, build, and maintain digital infrastructure to meet data industry standards are rare. A walk around most facilities, one sees that their digital hardware such as computers, servers, and processors, even if behind a closed door, too often work as air cleaners, pulling electro-static dust through them, coating their delicate internal components, and reducing functionality and reliability. Interesting correlation, most camera operators know the importance of a clean lens before shooting and are trained to perform a basic lens clean-

ing. When it comes to optical cabling (fiber optic), most M&E digital technicians are unaware that they too should clean each optical connection before connecting it. And they typically do not know how to perform a quick, basic optical connector cleaning. There are 9 different levels of power protection. What are they and which ones might be important to protect a production? These practices, questions, and more are the realm of digital infrastructure architects and technicians.

The Media & Entertainment Data Center Alliance (MEDCA) advocates for additional awareness and education, supporting M&E's ever greater migration into the digital world of the data industry, making visible what is currently invisible to M&E professionals.

#### **M&E FACILITIES: DIGITAL INFRASTRUCTURE STANDARDS GOVERNANCE**

The M&E production environment is unique in comparison to any other industry. Reduced to data file basics, M&E production workflows capture, process, and deliver digital picture, sound, and/or metadata files. Because governance boards such as SMPTE create standards supporting A/V production data-centric workflows (formats, protocols, applications), M&E facilities managers may incorrectly assume that the same governance boards are responsible for creating digital infrastructure standards. They are not. Only the data industry is responsible for creating and governing digital infrastructure standards and practices. They do so for the entire data-sphere, supporting critical industries such as global banking, national defense, and M&E. Fundamental to any data-sphere is its infrastructure. Data center infrastructure supports all data gear and environments, data centric workflows, from on-prem asset management to the connected stage, visual effects, and other production and post processes, including virtual production and 2110.

#### **M&E PRODUCT MANUFACTURERS AND DIGITAL INFRASTRUCTURE**

Why should companies that offer data application and equipment solutions in the M&E space care to advocate data center standards within M&E? Software and equipment only operate as well as the digital infrastructure that supports them. Digital infrastructure, Open Systems Interconnection's (OSI) Layer 1, is the foundational layer upon which all other data layers are supported. Although the role of IT, AV engineers, and operators do not include Layer 1, they are supported by Layer 1. Promoting M&E facilities and services

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# THE LOCALIZATION FLASH MOB

By Hollie Choi, Executive Director, EIDR



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The process of localizing content for distribution internationally has charmingly been described as spaghetti-like. I prefer to think of it as a flash mob.

Do you remember flash mobs? The purpose is to initially confuse others, but then entertain them. There is an organizer, and dancers volunteer (or more often, are recruited) to participate in a choreographed routine performed in a public place. The internet and social media is used to coordinate the event. Then, they show up at the designated place and time and when the music starts, they bust a move. Spectators are in awe. And then they all go home.

As you think about localization, think of the studio or streamer as the organizer. The various dubbing studios, postproduction houses, and the myriad of other vendors, actors, and contributors participate while the organizer tries to keep them all in sync. The thing is, though, the organizer is operating somewhere between 40 and 80 flash mobs all at once. And they do not have in person meetings.

Let's take a single scenario and walk through how it happens today. A content creator licenses their episodes to a distributor, who has a streaming platform in multiple countries. From there, the distributing company must order localization. That could include compliance and other edits, subtitling, dubbing, captioning, etc. They need in-territory studios with native speaking translators and actors to ensure that the translations are clean and do not contain culturally insensitive phrases, things people in the territory would find offensive or ridiculous, etc. As the vendors and distributors do the work of preparing the content, the studio executive is eagerly awaiting status. They are flying blind and must rely on the excellent communication of others.

Imagine again that you are the organizer of a flash mob and you've sent out the choreography, but you cannot see if the dancers

*THE CLOUD LOCALISATION Blueprint is like a super-charged flash mob, except the dancers and choreographers are professionals, the best in the business.*

are doing it correctly. You would not know if Uncle Bob were doing the moves half a second later than everyone else. Uncle Bob could be messing up your entire plan. The studio has a similar experience when the localization process is taking place. They must trust that their massive team is dancing in time with the music - oh, the music! The music could be different depending on the territory too! Aye yai yai! You have to manage the rights too!

What is a 21st century supply chain to do? Well, if you are the team over at Fabric, you gather a small group of experts and ask them to solve the problem of deploying 60 flash mobs for every piece of content shared across borders. You give them 13 weeks and lock them up until they come out with a solution. To be honest, nobody was locked up, sequestered, or otherwise detained in the process of developing the Cloud Localisation (or Localization, depending on where you are in the world) Blueprint.

What is the Cloud Localisation Blueprint? Let's walk through the process of localization within the new model. You would start with your rights management system. We used Rightsline, but you can use any rights management system suited for media and entertainment. The scenario is: Pokémon licenses some episodes to Warner Bros. Discovery, which it then prepares for distribution via the HBO Max service.

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# STOP CHASING. PRIORITIZE THREATS BASED ON VALUE TO THE BUSINESS

By Richard Atkinson, President, CDSA



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In my many years in various businesses, one consistent thing I have seen — especially in the media and entertainment business — is a tendency for teams to be highly reactive and keep trying to address way too much. Especially in going after things that might have emotional aspects but mean little to the actual business. Certainly, in the areas of fraud prevention and anti-piracy, but in many other areas as well.

Before you call BS, let's talk about a few examples. I've consistently seen (meaning over and over and over, whether it is the in-house teams, or the vendors trying to support them and make a compelling difference) the situation where a team is trying to address all the geographies of the world. As if all the geos were worth the same to the business.

Letting specific markets like China or Russia or other small but problematic markets get way too much attention and resources is the issue. If we looked at the current revenue of your business by market, most will likely be about 33 percent domestic (USA/Canada) and the remaining 66 percent from other markets. If we looked at the top 10 in rank order, most likely it will be something like this: USA, UK, Germany, France, Canada, Japan, Australia, Netherlands, Nordics, Benelux ... or something similar. What is key is that the top five far outweigh the bottom five, and after the top 10 (or 15 if you have a strong level of business in countries like Mexico, China, Russia, New Zealand, Brazil) the rest of world is just noise.

You could spend huge resources trying to make a difference in a market, and even if you were highly successful, the business in that market might grow dramatically but would be a blip to the overall global business. Sure, at times the business is going to prioritize these regions and put very aggressive and demanding leaders in charge that pull on you hard to help them. But, again, for the overall

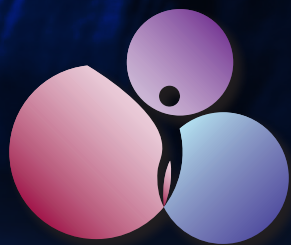
*YOU COULD SPEND HUGE resources trying to make a difference in a market, and even if you were highly successful, the business in that market might be a blip to the overall global business.*

business in terms of your value, you should focus first on those top five markets.

You say that the business already has those markets, so why spend time, effort, and money on a market that has low percentages of fraud/piracy when there are other markets with much higher need? The answer requires me to connect a few dots.

First, it is highly likely that your top three markets are all "mature," with relatively low fraud rates and a culture of higher brand trust and low aspects of black-market/alternative distribution. There is also likely a moderate amount of "customer-facing fraud" where customers are sold products and services that they believe are genuine but are not. If your team can address even a moderate amount of this activity, those customers — who are already paying for the product but just from the wrong people — will shift to legitimate business sales at high levels. Lastly, in terms of scale and opportunity, even though the rates of fraud are low the market/revenue is large. Meaning even if you can only impact a 15 percent rate by a few percent, it adds up to a LOT of value to the business. And, because these customers are already poised to pay, that revenue comes through existing channels and directly to the bottom line. You are a hero. But make sure you baseline things BEFORE you start ramping up. You want the results of your effort to

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# THE SECRET SUCCESS FOR STORYTELLING

By Mary Yurkovic, Director, Smart Content Council, MESA



*Mary Yurkovic is the director of MESA's Smart Content Council. She has more than 15 years' experience in the publishing, entertainment, and technology sectors.*  
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No one loves storytelling more than Hollywood. Actually, no one loves storytelling more than content creators. And how do global content creators create exceptional content that is localized for their audience?

## THE SECRET IS STORYTELLING WITH DATA.

If you want to create good content, you need to create content that not only has a good story but is also particularly relevant to those who are consuming it. One of the best and most accurate ways to understand your audience is through data. Because data can be complex, it needs to be reported in a fashion so it can be understood to create action. Creating the right, localized content requires data and insight.

Localization is about adapting products, services, or content to the cultural and linguistic specifics of a target market. It goes beyond mere translation and includes everything from translating your content into the local language to adapting your user interface, payments, images, formatting, and customer support — to name just a few elements — to local preferences, expectations, and conventions.

## THIS CAN ALL BE ACCOMPLISHED VIA DATA.

Take Netflix, which has used customer data to localize content for years. With a huge amount of data on its users, Netflix constantly uses it to improve the customer experience. This data is also used to inform localization decisions, such as which languages to offer content in and what type of content will be most popular in each market. This focus on data has allowed Netflix to create a localization strategy that is tailored to the needs of each individual market.

It's also no secret that Netflix employs many data experts. They are a true data-driven organization. And to be a true data driven

*CONTENT CREATORS NEED good storytellers. To be exceptional content creators, organizations need exceptional data storytellers to reveal the true action behind what is and what can be.*

organization one must go beyond merely analyzing data.

Organizations must have experts who can transform relevant data into compelling stories that key stakeholders can readily comprehend and leverage to make better decisions. This vital skill is known as data storytelling, and it's a key factor for creating content that is worthwhile to content consumers in their specific markets.

Data storytelling is a critical skill for data-driven decision-making. The data storytellers are always seeking to convey actionable insights from their data and must tell compelling stories with data, emphasizing context and narrative (internally), then act on this useful "information" to ensure their audience (externally) has the most pertinent content.

So, what does data storytelling entail and how can experts put it to work to make good on data's potential and make a profit?

Telling stories with data is difficult — very difficult. However, keeping it simple, the "story" begins with knowing your audience. Starting with who your main "characters" are, that is, the audience for your data story. What information is most important to them? Structure the data story so you anticipate the next question the audience will have by thinking like the reader of the story.

*Continued on page 131*



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# LOCALIZATION



The industry witnessed a silver lining in the cloud that was the pandemic: almost more localization work than the business could handle. Along with new safety protocols came new technologies to help handle the load. But are there enough linguistic professionals around to keep up with the insatiable demand for localized content? Get ready for a wild ride.

# OPTIMIZE LOCALIZATION BY INTRODUCING MACHINE TRANSLATION DURING PRODUCTION


 A hand holding a smartphone is shown in the background. Overlaid on the image is a semi-transparent rectangular box containing the word 'translate' in a white sans-serif font, followed by a toggle switch labeled 'ON' with a white circle to its right.
 

translate ON

**AI-powered machine translation may be the localization sector's best hope**

**ABSTRACT:** There are not enough linguistic professionals to keep up with the insatiable demand for localized content. Aggressive international expansion only exasperates this challenge. By introducing AI-powered machine translation earlier during production and post-production, media companies benefit from economies of scale, a seamless post-edit process, and better creative outcomes.

**By Janice Pearson,  
Senior Vice President,  
Sales, Strategy, XL8**

The media and entertainment localization community is experiencing growing pains due to explosive market growth for content across every platform and language. Note:

- More than 200 streaming services are available around the world. BlueWeave Consulting reports that the streaming market will grow annually by 21 percent between 2021 and 2028 with an estimated total value of \$330 billion by 2030.

- The global TV broadcast and media market is expected to grow from \$48.47 billion in 2022 to \$72.09 billion in 2026 at a CAGR of 10.4 percent, according to Reportlinker.com's "Broadcast and Media Technology Global Market Report 2022."

- The theatrical market has a market size of \$95.45 billion in 2022 and a revenue forecast of \$169.68 billion in 2030 at a CAGR of 7.2 percent, according to Grandview Research's "Movies and Entertainment Market Size Report, 2030."

ment Market Size Report, 2030."

- U.S. streaming platforms aggressively expanded into international markets to gain more subscribers, resulting in greater demand for original language content within the territories these platforms served. To fill this void, content was sourced through licensing and acquisition deals and localized catalog content.

There are no signs that the demand for content will decrease. It's in the interest of content owners to make streaming more appealing to customers, which requires continual growth in the amount and variety of content. Subscribers have an insatiable appetite for consuming content anywhere, anytime, and on any device and require compelling content to stay engaged, as well as an extensive library.

During the pandemic, consumer habits changed due to their exposure to great storytelling in foreign-language content provided by OTT services.



## *WITHOUT AI-POWERED MACHINE translation, the current state of localization is unsustainable. We run the risk of linguists leaving the industry due to burnout.*

Foreign language content offered new narratives that were captivating and original, resulting in subtitled foreign language content entering the mainstream. This phenomenon proved that audiences read when a story is compelling. Perhaps the greatest shift happened with younger consumers who spend more time on the internet and are more open to foreign language content. According to GWT's research, "In the UK and U.S., 76 percent of Gen Z/millennials watch foreign language TV shows or films, compared to 56 percent for Gen X/baby boomers."

Given the current volume of content being localized for streaming, linear/broadcast, and theatrical markets and the increasing demand for localized content, there are simply not enough qualified linguists to translate all this content. Additionally, content is being localized from more source languages and translated into more languages than ever before.

Being a linguist in media and entertainment requires creativity; storytelling capabilities; a deep understanding of cultural nuance, formality, and genre; and language fluency — all while complying with each content owner or distributor's unique technical specifications and profiles. Localization service providers (LSPs) are currently over capacity and can only rely on the capacity available within the freelance market. Even the freelance market is limited because all the LSPs are using the same people and pre-booking time. More linguists will need to be recruited from other sectors or universities and trained. It will take time to build up our human resources, especially when the Bureau of Labor Statistics predicts only a 2 percent year-over-year growth in translators entering the workforce.

With a tight labor supply, there are only three variables that can adjust to meet the current demand for localized content — time, money, and technology. But:

- Unfortunately, LSPs don't have the luxury of more time due to compressed timelines resulting from shrinking release windows and last-minute release changes.

- Spending more money isn't the answer. With hundreds of billions of dollars being spent on creating content and increased operational costs during a recession, content

owners and distributors are more cautious of the bottom line.

- AI-powered machine translation technology is the only effective option to help companies scale to handle unlimited market demand. By focusing linguists' valuable creative and technical skills on refinement tasks through Machine Translation Post Editing (MTPE), repetitive and tedious tasks can be done through automation and machine translation. Not only does this allow linguists to focus on what they do best, but it also provides more time devoted to translation accuracy while increasing the throughput of each linguist.

Without AI-powered machine translation, the current state of localization is unsustainable. We run the risk of linguists leaving the industry due to burnout. We also risk not having enough localized content to meet demand. Therefore, if we can start the localization process within the production and post-production window, it will provide additional time to complete localization with better accuracy, economies of scale, and creative outcomes.

Starting the localization process during production is crucial because the creatives are still attached to the project, including directors, editors, and most importantly — the actors. This provides a better environment for linguistic directors to collaborate with all parties and ensure that the creative intent is carried through the subtitling, captioning, and dubbing process. The following are some additional examples where AI-powered machine translation creates efficiencies that support the creative process:

- Speech-to-Text capabilities can support continuity during filming by capturing dialog that was "off script." This helps editors and directors choose scenes for the rough assembly and alerts script supervisors/screenwriters where adjustments need to be made to support dialog for scenes shot out of sequence.

- Speech-to-Text capabilities also create efficiencies for non-scripted entertainment where stories are crafted after the footage is captured. Human transcription is a laborious



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process that speech recognition technologies produce in minutes, helping producers craft storylines quickly before viewing the footage.

■ Machine translation can be used by screenwriters when writing jokes or punchlines. A quick machine translation job can indicate how the meaning may be perceived by their wider, international audience.

■ For pre-recorded broadcast television content where 20-26 episodes are shot within a nine-month period, machine translation paired with post-editing provides the level of scale necessary to offer the series day-and-date for a global release.

■ Synthetic dubbing is a cost-effective alternative that may be appropriate for some content. When actors are still involved with the project, it is much easier to conduct the proper voice sampling necessary to get a good outcome and negotiate their contractual requirements.

The main objections to starting localization earlier in production lie in two areas. First, the dialog or scenes may change after its first release (e.g., new theatrical release, streaming release of a feature film). The beauty of AI-based technologies is that engines can detect these changes. LSPs who worked on the original version can focus on the changed elements. The second and most difficult issue to address is the selling of rights. While a great deal of planning goes into determining where

the content owner will own and sell rights, rights are often negotiated at the last minute and translations may need to be rushed. Rights may transfer to a distributor, and the localization elements may not transfer in the sale because they were never created or cannot be found due to the age of the content. This results in unavoidable, redundant localization activities but machine translation can also support this challenge.

Given the localization community's current challenges, the most cost-effective way to keep up with increased globalization is by implementing the latest technological advancements. Statistics show that localization service providers using machine translation technologies increase their throughput by 30 percent or more and they achieve higher profitability through cost and time reduction. Using machine translation earlier in the content lifecycle would provide further efficiencies and could improve the creative process when used strategically. Before implementing AI-powered machine translation technologies, ensure that you are using a high-quality engine trained with media content that is 100 percent hand-curated by professional translators. This will produce better quality results than engines trained with imperfect data scraped from the web. Context awareness greatly impacts translation quality by using the information in surrounding sentences to inform the translation vs. translating word for word. By using specialized engines with these capabilities, your high-quality results will require less post-editing and time – ultimately improving throughput and scale. ■



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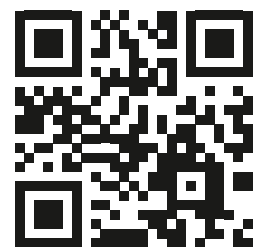
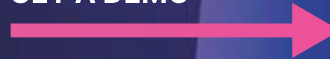
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# VIDEO LOCALIZATION TOOLS: THE ONLINE ERA



Adoption of online editors was accelerated by the COVID-19 pandemic

**ABSTRACT:** Never have we seen such an abundance of tools for video localization. The Nimdzi Technology Atlas lists hundreds of localization tools in the market, including well over one hundred for audiovisual translation and transcription alone. How far has the technology come at the dawn of the third decade of the 21st century and where is it heading?

By Alex Yoffe, Product Manager, OONA

Video localization technology first came about decades ago with the introduction of affordable desktop computers. These allowed a single person to carry out the entire subtitling process. These first subtitle editors were DOS-based, linked to a TV monitor and video cassette player with a jog shuttle. Desktop computers and company servers became the mainstream equipment for subtitle production in the 1990s.

Things changed profoundly with digitization. Subtitling software mushroomed in the noughties, freeware too. Word class subtitle editors were developed with features such as accurate frame timing, shot-change detection, wave bar, reading speed indicators, customizable hotkeys, automated backups, sophisticated quality assurance and assisted translation tools. They also provided the ability to use templates and presets, communicate between team members and convert between any of the myriad of file formats used in the industry. For live subtitling workflows, speech recognition software was also integrated in the user interface to allow for dictation-based workflows. In short: software tools could support practically anything a subtitler could ask for.

Translation management systems also made their appearance in the noughties. Content volumes skyrocketed and production was

centralized with the appearance of DVD. With cloud infrastructures increasingly adopted, it was inevitable that subtitling toolkits would move to the cloud as well. This took place the following decade as the streaming era caused another large increase in the volume of content which needed to be localized.

The primary factors for the selection of cloud infrastructures by businesses have always been ease of deployment and data security. The latter had been a prime concern for the media sector: multi-factor authentication, video watermarking, cybersecurity certifications, continuous pen testing and 24/7/365 technical support are now the norm for platforms used by language service providers wishing to offer video localization services to their end clients.

Online subtitle editors are now used by most of the top media localization providers, typically integrated into a translation management system. The better ones lack none of the prime features of the best desktop software of the previous decade, such as automatic shot change detection and audio scrubbing, a sine-qua-non for frame accurate subtitling.

Integration to a translation management system allows the automatic handling of client orders, automated or bulk assignment of work to resources, live dashboards, file management and user metrics, as well as integration with finance tools for a complete end-to-end solution. Work allocation and completion are thus managed and controlled more effectively and transparently with in-built communication tools that facilitate remote and collaborative work. This cuts down duplication of effort, turnaround times and the potential for error. It also offers a seamless experience to users. Production can be scaled up easily as content volumes fluctuate and requirements change.

The adoption of online editors was accelerated by the COVID-19 pandemic. It created a surge in the development of professional online tools for revoicing purposes following the global closure of dubbing studios during the lockdowns. Dubbing had been a very local and fragmented industry for years with many family-owned businesses in the market which allowed manual prac-

***THE FORCED CLOSURES of studios all over the world provided the necessary push to reprioritize software development agendas. In the past few years, we have seen most top media localizers adopt their own custom-made platforms to enable audio localization work in the cloud.***

es to perpetuate. The forced closures of studios all over the world provided the necessary push to reprioritize software development agendas. In the past few years, we have seen most top media localizers adopt their own custom-made platforms to enable audio localization work in the cloud.

The benefits of fully integrated cloud systems used for subtitling purposes shone through the pandemic and provided inspiration to streamline all other media localization production in the cloud as well. Script editors are very much like subtitle editors in terms of functionality, with different settings relating to timing rules, line length, character limits and so on. The industry saw an increasing push to repurpose content and access file metadata as early in the process as possible, to inform technologies such as machine translation that are used downstream. It made sense for scripting production to move to the cloud as well.

“We have been working hard on developing our scripting tool further to accommodate our client needs best,” said Wayne Garb, OOONA co-founder and CEO. “Functionality such as ‘multilayers’, or the ability to display multiple tracks simultaneously, a must in Japanese subtitle production, has been available in our scripting tool too for a while,” he adds. “We remain customer-responsive in our development roadmap. A recent study of requirements from our client base indicates a strong demand in scripting and audio localization work, so it is our priority to develop such features to best support this market trend.”

The ability to record remotely combined with the

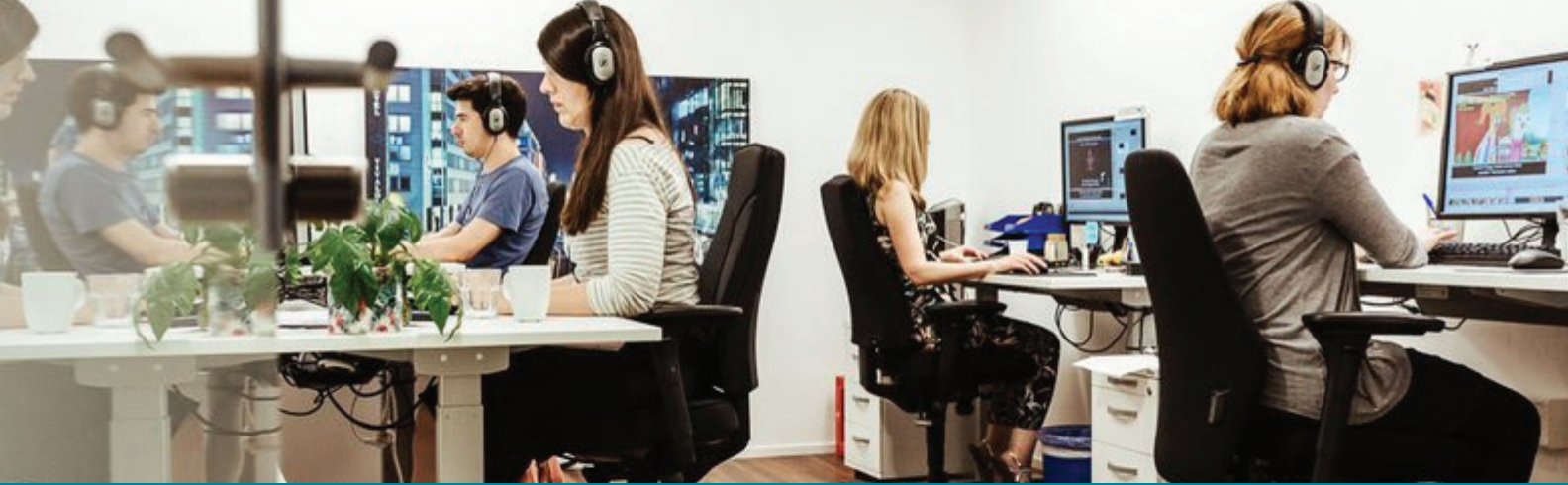
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*Alex Yoffe is the product manager of OOONA Tools, a suite of web-based localization tools for media content. Alex studied industrial engineering and management at Technion, the Israel Institute of Technology, and worked previously in media content management. [alex@ooona.net](mailto:alex@ooona.net) @Ooona13*

# EMBRACING THE NEW: THE RISE OF LOCAL LANGUAGE CONTENT

Is this openness and desire from audiences to watch non-anglophone content a recent phenomenon? Or was it always there?



**ABSTRACT:** What do you mean, it's not in English?! Local language content is currently popular with audiences and seems to be here to stay. What historical, social, and commercial factors have led to this sea change in commissioning and viewing habits, and what are the implications for globalization vendors? This article looks at the rise of non-English source language content, and the importance of the viewer experience when it comes to the localized versions.

**By Dr. Lindsay Bywood, Public Relations Officer, and  
Sarah Goff, Head of Marketing, VSI**

Something has changed in the world of media and entertainment. Audiences who already consume their content — dubbed or subtitled — in languages other than English might have noticed the change later than those who routinely watch anglophone content, but it is hard to ignore. When it comes to production languages, English now shares the limelight with a myriad of others.

Of course, local language content has always featured in most major content providers' offerings, but up until recently, it wasn't as widespread. This current increase seems to have been stimulated by streaming platforms: Netflix commissioned content from 28 different markets in the space of just one quarter in 2022 and other VOD platforms are clearly demonstrating a similar focus.

Starting with the launch of cable and satellite television and continuing with the advent of streaming

platforms, viewers have been handed the opportunity to access a wide variety of content. As a result, the delivery and consumption of entertainment on offer has changed. Non-linear viewing opened the door to new release schedules and the possibility of accessing back catalogues, which would have been unthinkable in the days of purely terrestrial channels. And audiences have enthusiastically seized the opportunity.

The modern world's connected nature and the improved facility for giving feedback mean that content providers are now much more in-tune with viewers' preferences and audiences can communicate directly with those responsible for choosing their entertainment. Viewers take to social media to discuss the quality of localized versions, including casting decisions, at times garnering the attention of the global press. The increased



**IT SEEMS THAT THE ENGLISH-SPEAKING** audience for local language content will continue to grow as the publicity around the high-profile releases snowballs and more and more viewers are exposed to a plethora of ideas and stories from across the globe.

focus on diversity and inclusion that we've seen throughout the industry over the past decade is also an apparent hot topic when it comes to viewing behavior. It is natural for individuals to want to see relatable people and cultures and the content producers are focused on this too, bolstering content that is more inclusive and representative of a wider cultural spread.

Some of the rise in local language content has also been a result of legislative pressure. EU regulations state that for broadcasters and streamers operating within the territory, 30 percent of the content they produce must be from EU countries to promote cultural diversity within the Union. This currently still includes the UK, but that may change when the rules are reassessed in 2024. Other countries, such as China and Canada, have similar requirements for local programming that may influence purchasing and programming decisions, leading to more culturally diverse content available in these countries.

The global shock administered by the pandemic rippled through the audiovisual content industry, as it did the world. As production slowed down, content owners were forced to innovate to keep their offerings fresh and varied, looking to their back catalogues for inspiration. Local content had started to be commissioned and produced in different territories and streaming platforms could now look to leverage this content in wider, global markets. This reinforced the ramping up of non-English-source content for localization and distribution in other markets.

Perhaps the most interesting question this development provokes, and the most difficult to definitively answer, relates to the social and cultural shift that it highlights. Is this openness and desire from audiences to watch non-anglophone content a recent phenomenon or was it always there? One of the most striking observations is the appearance of dubbed and subtitled programs

in English-speaking homes. Historically, there was understandably less need for localization in these markets since so much entertainment content was produced in the U.S. or UK. When it came to non-English content, the attitude was that these viewers were less likely to consume it as it wasn't something they were familiar with. Viewers could be put off by the atypical experience of consuming dubs or subtitles and would need to feel that the localized versions weren't a translation in order to enjoy it. At the same time, there appeared to be an underlying assumption that watching translated content was somehow inferior to watching it in the original production language. The current trend does not seem to bear those assumptions out, however, since dubbed and subtitled content such as "Squid Game," "Casa de Papel" ("Money Heist"), Parasite and "Deutschland 83/86/89" have proved highly popular and show no signs of waning in popularity.

While localizing into English is far from a new requirement, this change in attitude towards content produced in other languages has exposed a need to further ramp up the amount of talent and resources in the localization pool to support the continually evolving demand. Translators, and by extension subtitlers, into English have historically been thinner on the ground compared with professionals working from English. To ensure a seamless viewing experience, it's also key that dubbing adapters and directors are highly skilled, to produce a dubbed version that resonates with audiences unused to them.


At VSI, we understand that as the world continues to become more globalized and people more interested in different cultures, one thing is certain: international content will continue to seep into new territories. That also comes with a focus on diversity in representation, where different accents and dialects must be heard, and

*Continued on page 130*



*Dr Lindsay Bywood is a trained subtitler who has been working in the localization industry since the 1990s. She currently combines her role as public relations officer at VSI with lecturing in translation, professional development and audiovisual translation at the University of Westminster and elsewhere, with her research efforts focused on audio description for inclusive design.*  
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# IDENTIFYING INTERNATIONAL DATA PRIVACY RISKS IN LOCALIZATION OPERATIONS



Today's privacy challenges call for standardized industry controls and benchmarks

**ABSTRACT:** Localization workflows include processing high volumes of freelancer personal data (translators, adaptors, subtitlers, etc.) by the supply chain. The data is often subject to extra-territorial data protection and entire supply chains are co-responsible for each other's compliance. Data is shared, without monitoring, by all stakeholders. Shorter project turn-arounds make it difficult to verify and monitor resource/vendor compliance. Industry best practices haven't integrated data protection particularities of localization workflows. Service providers and their clients need global understanding to mitigate risks.

**By Nicole Quilfen, Chief Operating Officer, Mediartis, and Stephanie Iyayi, Senior Vice President, Legal, Privacy, Convergent Risks**

In today's increasingly digital and global age, many companies in the media and entertainment sector have embraced a critical strategy for capturing new markets worldwide: content localization. So, why are localization workflows the industry's modern Trojan Horse? For the simple fact that freelancer personal data and partner compliance are frequently neglected in data privacy strategies.

Since the European General Data Protection Regulation (GDPR) came into effect in 2018, many organizations have been performing privacy and security gap analysis assessments and investing in data security and privacy tools. Privacy policies have been adapted to secure the personally identifiable information of customers and in-house

personnel. Vendor privacy assessments are increasingly popular, often carried out as part of a due diligence process, in large part due to the regulation's notion of compliance co-responsibility. However, while the industry has made significant progress, the processing of freelancers' personal data in production workflows and the lack of standardized vendor privacy controls leave companies exposed to data breaches as these data are often overlooked in privacy strategies and unaddressed in policies.

### HIGH RISK AREAS: FREELANCER PERSONAL DATA AND PARTNER COMPLIANCE

Production workflows are particularly high risk as they involve processing high volumes of freelancers' personal data. Service providers have long considered the size of their talent database as a key business asset but are now considering the resources in a different light when the data relates to European citizens or residents.

Freelance contracting has become the norm in localization. During pre-production, all project stakeholders work together and share high volumes of freelancer personal data during a very concentrated period to agree on the best resources for a project: voice actors, translators, subtitlers, QA analysts, post editors, etc. Unsecured and unmonitored, personal data circulates extensively between internal services and production and dubbing companies, studios, agents, creative directors, and content owners. Resources are untracked and original data sources and privacy compliance are often unknown.

Data is shared physically via email, uploaded to FTP addresses and clouds, etc., with no visibility of how the data is being processed on the receiving end where shared data is often added to internal databases for future projects, thus exposing the data controller to data breaches. Further complicating data protection management, these databases are often maintained by individual services as talent contracting tends to be managed directly by the related service, and the data remains under the radar of data protection controllers and the data compliance is left unmanaged.

**COMPANIES NEED COMPLIANCE visibility across their global resources, the controls to meet the requirements of global, regional, and country compliance regulations and simplified partner compliance visibility to mitigate non-conformity risks.**

Compiled over time, these databases often contain outdated data, whose original source and compliance status are unknown. In fact, data subjects are often unaware their data is being processed and shared with third parties — regularly transferred across borders, and rarely secured or encrypted. Companies processing this personal data have specific legal obligations to respect, even if the data was collected before the legislation came into effect, and failure to do so can result in penalties of up to €20 million or four percent of their last fiscal year's global revenue, litigation from a high-profile individual or damage to a company's reputation, should a breach arise.

### WORLDWIDE DATA PRIVACY

The GDPR represented a landmark for data protection. Trading blocs, governments, and privacy organizations took note, and over the last four years, the regulation has inspired new data privacy legislation worldwide. Regulations like the European legislation are driven locally within Europe, but the scope of impact is global and applies to the processing of European residents' data, no matter where in the world the data processing takes place. Any business, no matter where they are located, that uses, processes, or controls data for European citizens and residents must meet all the requirements of the regulation. This responsibility flows from any entity processing data and the data controllers that provide that direction.

In its most simple terms, the legislation defines personal



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*Nicole Quilfen is the chief operating officer of Mediartis. She comes from a business development background specializing in international strategy, personal data protection, and accompanying media and entertainment localization partners with their operational privacy strategies.*  
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data as any information that can be used to identify an individual such as names, addresses, emails, telephone and social security numbers, etc., and provides specific guidelines for processing what is referred to as “special categories of data” such as data revealing racial or ethnic origin, religious beliefs, or biometric data like the voice which, in almost all circumstances, infers an individual’s identity. Voice data is particularly unique, given that a vocal recording may reveal, *inter alia*, the ethnic origin of an individual (through accent) or a potential health condition such as Parkinson’s which can affect speech. Sensitive personal data such as the voice, is subject to even more stringent protections under the regulation and must be encrypted in transit and at rest.

### OUTSOURCING AND PARTNER NON-COMPLIANCE RISKS

Security guidelines, detailed in industry best practices, provide standardized benchmarks that simplify vendor selection and monitoring. Vendor privacy controls, however, have not yet been integrated into the industry’s playbook, and without a roadmap or standards for evaluating compliance, vendor selection is risky, complicated, and next to impossible for organizations to monitor without third-party verification. Project-specific partner privacy assessments are crucial for content providers, creators, and owners for vendor selection and monitoring, and for service providers when subcontracting local projects.

Frequent outsourcing of projects by multilanguage vendors to single language vendors in each target country, who sometimes outsource externally themselves, multiplies data breach risks as project compliance is difficult to verify when tier two and three vendors contribute to projects. Supply chain compliance is critical because the European privacy regulation introduces the notion of co-responsibility, meaning that a data breach at any step puts companies at risk of administrative fines. While most regulatory action has been focused on controllers, the Commission National de l’Informatique et des Libertés, a GDPR supervisory authority, fined both a data controller and its data processor for breach of security in January 2021 because they failed to comply with their respective obligations.

### PRIVACY COMPLIANCE — WHERE TO BEGIN?

In short, all resources need to be compliant and workflows involving the storage or exchange of personal data should be adapted to comply with the European regulation and adapted for local and regional-specific legislations.

Data controllers must ensure that data on European residents is only exported to places with similar data protection rules, keeping in mind that if the shared data is biometric, additional security measures probably apply. Canada, Brazil, Japan, New Zealand and South Korea and many other countries have adopted measures modelled on the European regu-

lation. While there is currently no data privacy law applicable to all industries in the United States on the federal level, every state has their own data privacy laws for example, California’s privacy regulation overlaps with the European legislation in many areas.

Compliance documentation requirements are extensive, and some include keeping privacy notices, policies, operating procedures, data processing records, risk assessments, third party data processing agreements, government submissions, various consent forms, etc., which must be in line with local regulations. Procedures respecting data retention and processing should also be reviewed and updated to meet regulations, and personal data must be deleted where there is no longer a legitimate need for processing it. Companies should document and record all of this if any supervisory authority investigates a complaint or logged event.

Freelancer consent of processing must be 100 percent independent of any work contract, recorded and up to date. If the data is sensitive or biometric, explicit opt-in consent should be renewed every two years. Organizational processes and the infrastructures supporting them, human and technology, must be adapted to support data protection legal obligations. Even sharing or using the data between internal services can be risky if secure compliance policies and framework are not in place.

Successful internal compliance begins with third-party data protection impact assessments across all services. Audit and Gap analysis provide clarity on areas an organization needs to focus on. Organization-wide training and awareness is imperative for compliance success and regular privacy health checks will make sure your strategy is effective. Data breach plans should be as solid as security breach plans and ready for immediate deployment.

Organizations must ensure technical and operational processes are in place to ensure data subjects’ rights can be met, for example, right to be forgotten, data portability, the right to object and subject access requests, including access to voice recordings. Privacy compliance should be integrated into internal audit processes, identifying all cross-border data flows, reviewing data export mechanisms, developing, and rolling out training across all personnel to ensure an adequate understanding of data protection principles, responsibilities and internal and external risks.

In summary, the localization industry has complex challenges to meet which are driven by various global compliance regulations. Service providers and their clients face many different scenarios as each country they do business in may have different requirements for data privacy and protection. Today’s privacy challenges call for standardized industry controls and benchmarks. Companies need compliance visibility across their global resources, the controls to meet the requirements of global, regional, and country compliance regulations and simplified partner compliance visibility to mitigate non-conformity risks. ■





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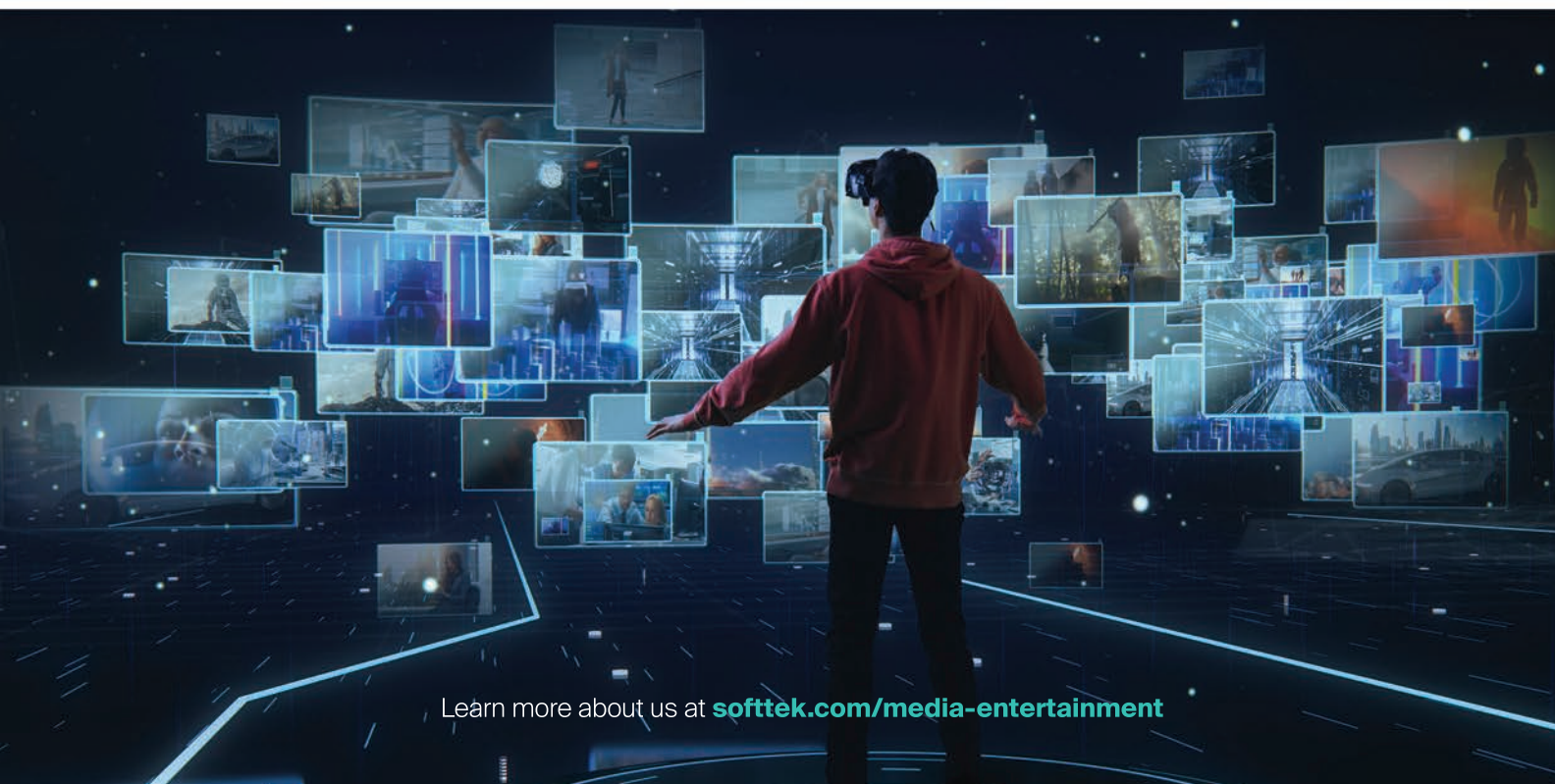
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# IMPERATIVES OF INCLUSION AND DIVERSITY IN MEDIA LOCALIZATION



**Major industry players are working to navigate this challenging terrain and overcome these challenges**

**ABSTRACT:** Making media content accessible and resonant to global audiences requires a multidimensional approach to inclusion & diversity. We propose a framework for exploring industry practices for accessibility and localization that centers the experiences and viewpoints of underrepresented groups and a diverse range of communities whose stories are reaching wider audiences.

**By Matteo Natale, Head of Global Accessibility, Localization Services, and Gustavo Marzolla, Director of Linguistics, Vubiquity**

When should a character's caste, ethnic, or racial identity be described in audio description? What role, if any, should race or ethnicity play in the casting of dubbing actors? How should a religious slur be translated into a language and culture where such a sentiment would be unfamiliar? Should American Sign Language be translated in U.S. English closed captions or subtitles for the deaf and hard of hearing? What languages, dialects, and accents are represented in localized versions of TV shows and movies? How can content localization respect the original intent and adapt to target audiences in sometimes distant cultures in accessible and inclusive ways?



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*TO MAKE THESE STORIES TRAVEL and resonate with new audiences and cultures, professionals need to navigate the challenges of discerning the intent and impact of the original on its intended audience — which itself may be diverse and may elicit a multiplicity of readings.*

### MODES OF ACCESSIBILITY AND TRANSLATION

The goal of content accessibility and localization, in its simplest sense, is to bring content to new audiences for whom the original version isn't accessible. This can involve the addition of captions, subtitles, or narration to translate dialogue, sounds, or visuals. It can also involve the full replacement of the dialogue in a new language. Unlike most other forms of translation, these accessibility and translation approaches weave text and/or audio into the fabric of the original audiovisual content.

Providing audio description (AD), closed captions (CC), translated subtitles, signing (such as British Sign Language or LIBRAS), and dubbed audio is an act of inclusiveness of more diverse viewers (or users, households, etc.) in itself, albeit usually one often driven by commercial goals or regulatory requirements. Creating these materials well and equitably, however, requires considerations of representation and participation (that is, of inclusion and diversity) in a range of areas — from the cross-cultural transference of meaning (or “filmmaker intent”) to the participation of diverse talent in the creation of AD, CCs, dubs, and subs.

### FILMMAKER INTENT

If content accessibility and localization are meant to bring stories to new audiences, the process inherently must start with the story itself. How are these stories told, who's telling them, and how are diverse groups represented — on both sides of the camera and in the boardroom? Across genres and around the world, more content is being created and localized than ever before, and there's undoubtedly an industrywide push for more

and better representation of and by underrepresented groups. Notably, these groups and their contexts in local histories, cultures, and societies vary greatly.

### TRANSFERENCE OF MEANING

To make these stories travel and resonate with new audiences and cultures, professionals need to navigate the challenges of discerning the intent and impact of the original on its intended audience — which itself may be diverse and may elicit a multiplicity of readings. They also need to adapt this intent and impact in a way that resonates in the target language and culture, all while weaving the audio or text within the time and space constraints of the original. These challenges inevitably require translators and other contributors to make trade-offs. Hence the saying “traduttore, traditore,” the translator is a traitor. Conveying socially ingrained constructs like race, gender identity, or sexuality in America to an audience with drastically different histories and cultural norms is fraught. Language sensitivity and voice casting guidelines aim to avoid the introduction of inaccurate or offensive representations in localized versions, but these are only first steps.

### CREATIVE TALENT PARTICIPATION

The participation of diverse creative talent is key to successfully creating compelling accessible or localized media

*Continued on page 120*



*Matteo Natale is Vubiquity's head of global accessibility and localization services. He has held various roles in the localization and entertainment industries over the past 20 years, with expertise in dubbing, subtitling, captioning and audio description. He was the inaugural chair of the Entertainment Globalization Association's Insights Committee. [matteo.natale@amdcs.com](mailto:matteo.natale@amdcs.com) @VUBIQUITY*



*Gustavo Marzolla is Vubiquity's director of linguistics. He has been working in content development and localization for more than 15 years and was instrumental in the process of regionalizing a major streaming platform's EMEA dubbing team. He now oversees the global pool of partners and freelance talent at Vubiquity, where inclusion and diversity are reflected as a core value in all projects and practices. [gustavo.marzolla@amdcs.com](mailto:gustavo.marzolla@amdcs.com) @VUBIQUITY*

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# SIMPLIFYING THE SEARCH FOR AN ACCESSIBILITY PARTNER



Ensure your content is hitting its accessibility mark

**ABSTRACT:** Though there are many components that make up good captioning, transcription, subtitling, and audio description, securing professional accessibility services doesn't need to be complicated.

By Louise Tapia, CEO, Take 1

Inclusion and accessibility remain important topics as businesses and industries around the world expand their focus on developing accessible products and solutions. The media and entertainment industry is no different as there continues to be a greater (and welcome) push for accessibility and accessible communications across the M&E landscape, including within the broadcast, cable, and streaming TV sector.

As viewer expectations evolve, captions, subtitles, transcripts, and audio description, among other access services, are no longer considered a luxury and now are an expected part of audio or video content.

Broadcasters, content creators, and production houses are finding that by making their content more accessible they not only satisfy government rules and regulations but also connect with more viewers, create a bigger buzz for their programs, and ensure that all viewers can enjoy their content.

## STREAMLINED ACCESS

Though there are many behind-the-scenes components that make up good captioning, transcription, subtitling, and audio description, securing professional accessibility services doesn't need to be complicated.



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A simple way to ensure that your content is hitting its accessibility mark (and its largest audience) is to work with a professional accessibility provider. Working with an experienced accessibility provider can save time, simplify workflows, eliminate stresses, and, in many instances, reduce costs.

Larger providers typically offer a broad range of services — captioning, description, subtitling, dubbing, and foreign language translation — thereby eliminating the need to go the piecemeal route and search for different services from different companies.

Getting all your accessibility needs from one provider means working with one point of contact and one billing department, and most importantly, receiving consistent quality in a single workflow from deliverable to deliverable and from project to project. Using one accessibility vendor often saves money, as many offer volume discounts for larger projects or when customers order multiple services.

Experienced providers understand the industry (and the shifting deadlines, quick turnarounds, and fire drills that go along with it), and often have answers to questions before they are asked. They work as a partner and can walk you through all the processes and requirements.

### THE RIGHT PARTNER

There are several video accessibility vendors out there, and you want to make sure to choose one that best fits your needs. Below are items to consider before signing your accessibility partner:

■ **Service offerings:** Does the provider offer a full range of services — captioning, audio description, subtitles, and transcripts? Do they offer captions for live and prerecorded content? Do they have industry experience?

■ **Quality:** Does the provider guarantee accuracy, and meet captioning standards and audio description guidelines? Are the captions created by human transcribers or by automatic speech recognition (ASR) programs? If human, what sort of training do captioners receive? If ASR, what sort of training does the engine receive? What sort of quality control does the provider offer? Do the captions include sound effects, lyrics, speaker IDs, and appropriate punctuation?

■ **Ordering:** It is important to understand how you send files to the vendor and how you receive the completed work. Can the files be uploaded or sent directly to the

**EXPERIENCED PROVIDERS** *understand the industry (and the shifting deadlines, quick turnarounds, and fire drills that go along with it), and often have answers to questions before they are asked. They work as a partner and can walk you through all the processes and requirements.*

vendor? Is the upload secure? Can you download the finished files just as easily? Will someone walk you through the process?

■ **Workflow:** How are the deliverables created? What is their process for creating captions and audio description? Can they deliver the finished files in different formats? For live captioning, how do they ensure uptime and resolve discrepancies?

■ **Flexibility:** Can the vendor work on tight deadlines and meet quick turnaround times? Do they have the staff and capacity to handle rush projects?

■ **Cost/billing:** Costs can fluctuate depending on the size of the project, services needed, and turnaround time, among other things. Are there any additional fees? How does the vendor handle its billing and invoicing?

■ **Customer support:** Will the vendor be available for technical support and any questions that come up during the ordering process or once the final files have been delivered? Is 24/7 customer support available? What's the best way to contact the vendor — email, phone, or online chat?

■ **Experience:** Has the vendor done this work before? Do they understand the industry? Are they familiar with accessibility rules and requirements?

It is important to do your research when choosing an accessibility vendor. Choosing an experienced, reliable, and professional provider can go a long way towards creating peace of mind for you and ensuring your content reaches its entire audience. ■



*Louise Tapia is the CEO of Take 1, a transcription metadata company that provides transcripts, access services, translations, and post-production scripts to the global media and entertainment industry. She's a fluent Spanish speaker who splits her time between the UK and Chile and is happiest spending time outdoors with her husband and two grown-up children. [hello@take1.tv](mailto:hello@take1.tv) @WeAreTake1*

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# HOW FAR HAS SYNTHETIC SPEECH COME?

And does speech synthesis have a future in localization?

**ABSTRACT:** Speech synthesis, a technology that started as assistive to the blind, has entered our lives for good. As deep learning-based synthetic voices approach the naturalness of the human voice, new opportunities for the implementation of the technology are appearing. Digital assistants, web content, games and social media are now common ground for speech synthesis, but where else might we see it in the future?

**By Volker Steinbiss, Managing Director, AppTek GmbH**

Speech synthesis is a technology that has been in the forefront of many discussions recently in the media and entertainment industry, with a strong media presence and funding spree. It is already a large part of our lives in the form of Siri, Alexa, and other digital assistants, found in call centers, embedded in modern automobiles, or as assistive technology for the blind.

It is interesting then to understand what milestones the technology has undergone to reach the quality and the use cases for synthetic speech we are enjoying today, as well as think about where we might expect it to go in the future.

Originally synthetic voices did not sound natural as people tried to reproduce speech mechanically without much success. Computer-based approaches in text-to-speech began in the late 1960s and we can hear early examples of systems developed in the 1970s and 1980s here. Such systems were based on expert knowledge and explicit modeling of the vocal tract, and it was not until the 1990s that the first data-driven approaches were used: the concatenative approach and the statistical parametric speech synthesis, which utilized some machine learning in combination with Hidden Markov Models (also used in speech recognition at the time). Those voices were much easier to understand but still sounded somewhat robotic and were the norm for a long time, to such an extent that a large part of the public still associates synthetic speech with them.

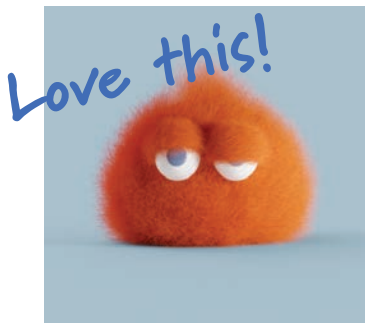
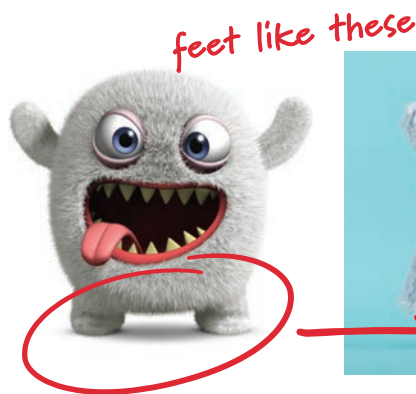
Things changed drastically when end-to-end deep learning approaches came along in 2016. Google's WaveNet (2016) and Tacotron (2017) models set the basis

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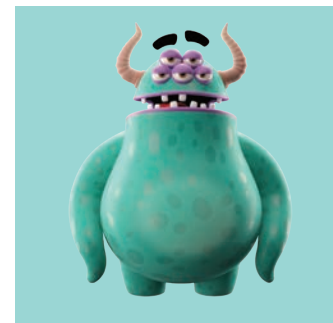
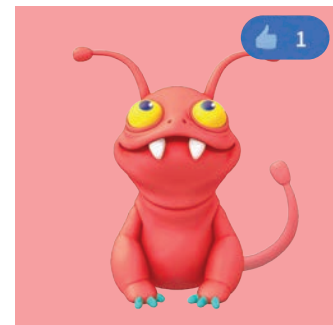
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***CLEARLY THE MAIN BENEFIT of the technology is audio accessibility in any language variant or custom voice at an exceptionally low cost which in turn creates the potential to apply it in much larger volumes of content that would otherwise not be localized at all in certain languages.***

of modern deep learning approaches to text-to-speech, which for the first time led to the production of synthetic speech models that could rival human speech in terms of naturalness.

Our imaginations have always been sparked by robots that can speak like us and even show emotion. From the voice of Hal in 2001: Space Odyssey, to C-3PO in Star Wars and many others, we have expected machines to be able to speak like humans long before this became a reality. Today they do — and they make our imagination run wild with more applications we could use them in.

The film industry is already making use of such technologies. Young Luke Skywalker's voice in the last episode of season two of "The Mandalorian" during Mark Hamill's cameo appearance was completely synthesized due to the actor's age. So was Val Kilmer's voice in Top Gun: Maverick, which was recreated for him from earlier recordings, as his vocal cords were permanently damaged after a throat cancer operation. An entire film, Salt, has now been released, produced entirely with synthetic media, including synthetic sound and speech.

What are the properties that we look for in synthetic speech for it to be considered a viable alternative to natural speech? Naturalness refers not only to the fact that a voice needs to sound human-like, but that it sounds human-like in a specific context. Hearing a flat but otherwise perfectly human-sounding voice when we see a person yelling does not sound natural. To achieve "naturalness in context" it is not only that the technology should be able to reproduce emotions, such as anger in this example, but that aspects of it can be controlled (manually or automatically) so that the right characteristic is used at the right time in the right context.

For this to happen, the first step is a wide range of languages and dialects for which the tech is available. To create such models, tens to hundreds of hours of carefully recorded and annotated data are needed — not an easy task or immediately available in all the world's languages

and dialects. The type of voice also needs to be controlled, so that it sounds like the high-pitched voice of a woman, the low-pitched voice of a man, or that of child. The same goes for speaking style, such as whispering, yelling, speaking like a cartoon and so on.

Controllability of the speech rate, i.e., speed, is an essential parameter for applications that involve time constraints, such as revoicing in video localization. On top of this, most types of revoicing require emotion, so it is also important to be able to control this too, so that a voice can sound happy or sad, or excited as needed, or display any of the range of emotions humans can express with their voice. It is the lack of emotion that makes us label a voice as robotic, or synthetic, even if it sounds perfectly natural otherwise.

Another advanced topic in text-to-speech research is adaptive speech synthesis, or in other words the ability to recreate a target voice that takes on the characteristics of a source voice one is trying to mimic, in terms of pitch, accent, pace, emotion and so on. The latest advancements in the field are closing the gap towards zero-shot speaker adaptation with great success, which makes one think of applications such as live automatic revoicing of news bulletins or any type of live event.

Clearly the main benefit of the technology is audio accessibility in any language variant or custom voice at an exceptionally low cost which in turn creates the potential to apply it in much larger volumes of content that would otherwise not be localized at all in certain languages. This is certainly the case for audio described content, a service typically addressed to a sight-impaired audience, who has benefited from the use of synthetic voices even in the pre-deep-learning era. Now it is possible not only to use AI to voice an audio description script, but to do so in an emotional voice if you so prefer, instead of a neutral voice that has been the case until now.

The quality of the technology today has reached a

*Continued on page 132*



*Dr. Volker Steinbiss is the managing director at AppTek GmbH and staff member at RWTH Aachen University. He holds a PhD in mathematics and worked on speech recognition at Philips Research in the late 1980s, before his interests broadened into more fields of human language technology, such as speech translation, synthetic speech, and natural language processing. [vsteinbiss@apptek.com](mailto:vsteinbiss@apptek.com) @AppTek\_McLean*



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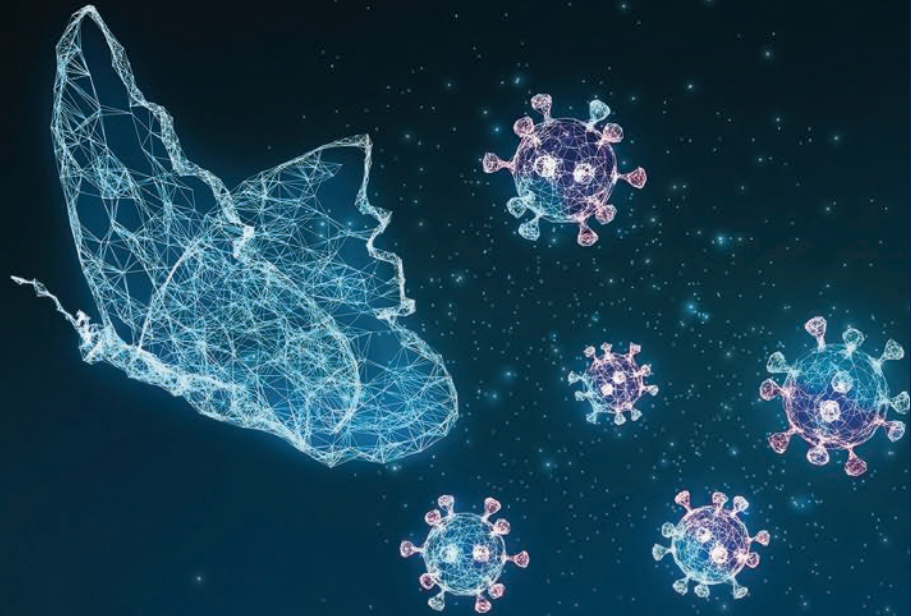
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# HOW COVID-19 CHANGED THE LANGUAGE LOCALIZATION INDUSTRY WORLDWIDE



**A combination of technology and better safety measures has made localization a pandemic standout**

**ABSTRACT:** Out of COVID-19 came a boon for the localization industry, with new technologies, new health and safety protocols, and a mountain of work for those who were ready for it. The only question is whether we'll ever go back to the way things were before. Not likely.

**By Deeny Kaplan, Founding Partner, Executive Vice President, The Kitchen**

There is no doubt that the past couple of years have been challenging, unusual, a learning opportunity and has taught us all a huge lesson that our industry, any industry, can be hit hard.

Whether you were in France, Israel, Brazil, Spain, Japan, or the U.S., almost overnight, you and your team were faced with events and decisions that absolutely none of us could have been prepared for.

Overnight, broadcast schedules were changed. Ballgames and in-person events were cancelled. Programmers at the networks were thrown into a head spin as commercials were pulled, along with anything featuring audience participation.

Some say that COVID taught us a lot. We tend to agree. And many of the pandemic procedures that were implemented overnight out of necessity, we believe, will most likely be with us all for the long run.

We do know that television viewership, around the globe, increased dramatically during the past two-plus years, as we were all obliged to spend more time at home. Some reports say that in-home viewing increased by greater than 75 percent. Many of the OTTs reported an increase in viewing time per household by nearly 50 percent. And we all know that increased viewing hours per household resulted in a demand for more programming of all kinds.

That this increase in global viewership has directly led to more work for the worldwide localization industry is quite positive for our end of the business, for sure. In fact, as a media provider, our home base studio

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in Miami was designated as a segment of the local business community that was permitted to stay open while other businesses were forced to shut down. We provided a service that was essential, as government regulators realized that TV and streamers were a necessity during the predicted long-term pandemic period.

Production globally was shut down immediately at the onset of the pandemic. Broadway closed. Movie theatres were almost all out of business and some first-run feature films were forced to make their debut on television. Award shows were reduced to Zoom calls. This was something we have never seen in our lifetime and which none of us could have been prepared for.

Technology, however, gave us our new reality. Zoom calls replaced in-person meetings and were the only road toward retaining any form of “teamwork” in any situation. Few of us had heard of Zoom before the pandemic set in. The company itself reports an 88 percent growth in 2020, and in 2021, Zoom’s revenues increased by 326 percent.

Remote recording studios, with a low-cost, but professional set-up that our engineering team constructed and tested, with similar set-ups popping up in closets around the world, were approved by clients to keep production alive, resulting in a great increase in the diversity of dubbing talent pools globally.

In-studio recording options were demanded by some clients however, amidst new protocols in procedures: temperatures were recorded daily, government-provided COVID cards confirming that vaccines were up to date were required, testing was needed and reported, hand sanitizers were everywhere, and changing mics, filters and cleaning of studios between sessions became a part of our day-to-day studio life. These new procedures were new to all of us, with adaptation to the newness globally being accepted quite quickly.

The protocols defined above pertaining to sanitation procedures in our studios are now a part of our culture worldwide. A good thing. Both clients and our talent look to us for protection, and we take the matter very seriously.

Streamers have been launched for all genres of programming, in every language. Demand for children’s programming, as more TV viewing time is permitted by parents, continues to grow. Day-time TV viewing, with higher-end programming, is in demand. Long-form series, to and from every language, in all territories, have become highly competitive.

*SOME SAY THAT COVID taught us a lot. We tend to agree. And many of the pandemic procedures that were implemented overnight out of necessity, we believe, will most likely be with us all for the long run.*

We are seeing catalogue programming, that many haven’t touched in decades, being localized into new languages.

What had halted production globally at the onset of COVID, no doubt has brought new challenges and new possibilities to those language studios providing dubbing or subtitling services globally.

As we were designated as an “essential service” by local government, at our Miami headquarters, we took the responsibility very seriously. We kept our staff and our talent working, amidst new pandemic protocols. We delivered all our work, on time.

Despite a changing global audience, with many requirements that were new to all of us, we delivered. Netflix led the way in opening opportunities for television viewers to look into all types of programming, in nearly every language. The influx of streaming services continues to add to the need for localization of programming and the demand of international versioning has grown by nearly 120 percent.

Streaming services are now generating more viewers than movie theatres. Smart TV purchases during COVID have risen by 56 percent.

In conclusion, our industry has brilliantly learned to live with the pandemic. Our health organizations globally are watching over us and providing medicine to combat the next generation of COVID. Home TV viewing has increased immensely, and we believe it will continue to do so, as the comfort and lower costs, as compared with a night out at the movies, may forever be affected.

For the world of language localization, we believe that the pandemic has made us stronger; it has taught us how resilient we all are; how alike we all are, as every country learned, lived, and adapted to our changing world. ■



*Deeny Kaplan is executive vice president and a founding partner of The Kitchen, a global language localization studio, with operations in 14 countries worldwide. [deeny@thekitchen.tv](mailto:deeny@thekitchen.tv) @thekitchenmiami*



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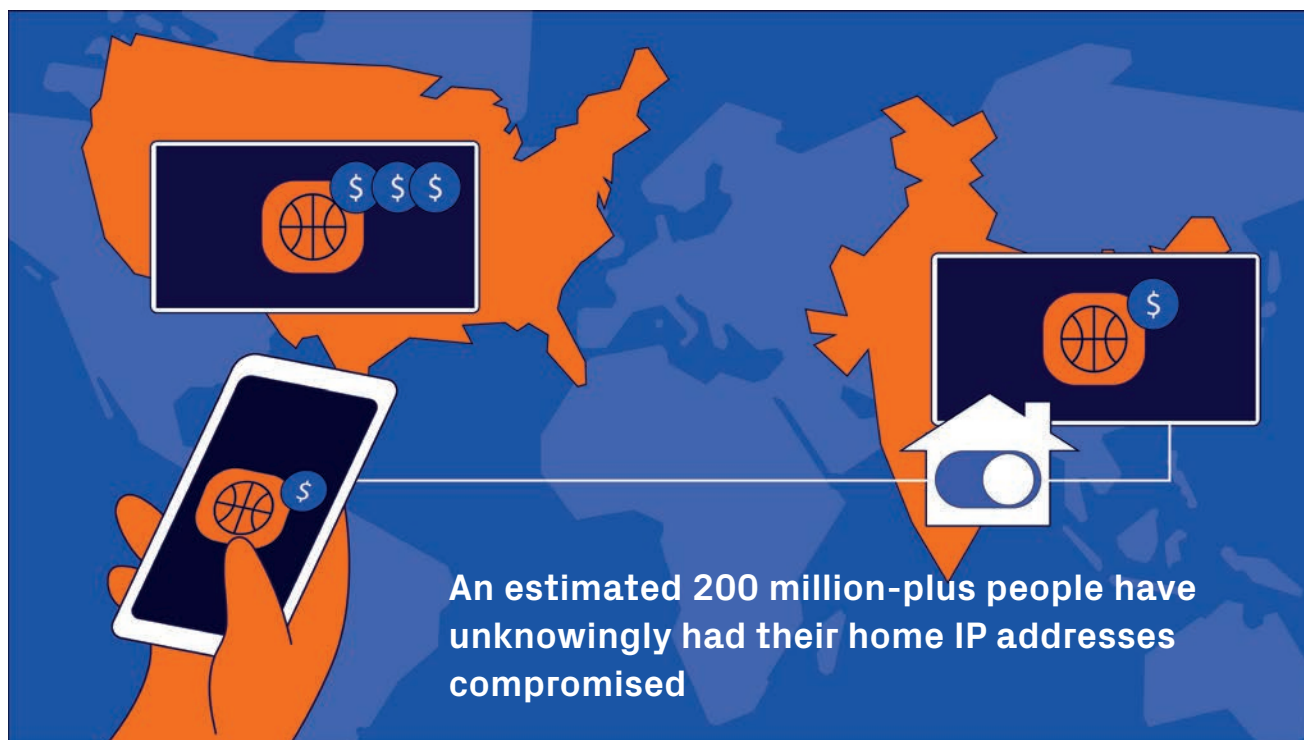
# SECURITY SOLUTIONS



Virtual private networks. Password sharing. Illicit live streams of sporting events. Oh, and your everyday content pirates selling Blu-ray Discs of your newly released theatrical content. The threats to our most valuable assets are many, and never-ending. Thankfully, media and entertainment vendors are on top of it, ready for anything the bad actors throw at content companies.



# HIJACKED RESIDENTIAL IP ADDRESSES: A RISING THREAT TO CONTENT EXCLUSIVITY



**ABSTRACT:** Pirate viewers use virtual private networks (VPNs) and proxies to access territorially restricted content. However, VPN providers keep unearthing sophisticated geo-piracy methods, such as selling hijacked residential IP addresses to rogue users. The technology required to pinpoint genuine subscribers helps streaming providers uphold territorial licensing and protect revenue.

**By James Clark, General Manager, Media, Entertainment, GeoComply**

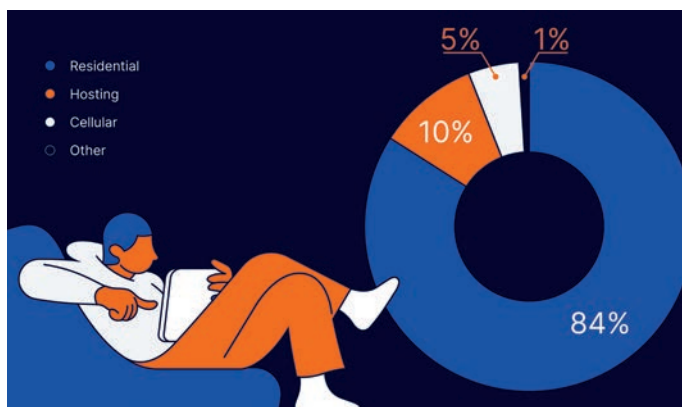
Today's viewers have an endless array of content at their fingertips. Unfortunately, many users circumvent VPN blocking controls to access territorially restricted content for free or at a lower price. For example, people in the U.S. who want to subscribe to the NBA's League Pass pay \$199.99 each year, while in India it costs 1,500 rupees, or a mere \$19.

In their quest for free or cheaper content, pirate viewers are getting more sophisticated. Their latest trick? Hijacked residential IP addresses.

## THE 200-MILLION-PERSON PROBLEM

We estimate that more than 200 million people have unknowingly had their home IP addresses compromised. A residential IP address is hijacked during a cyberattack or is harvested when users sign up for a free VPN or DNS proxy service without reading the terms and conditions.

This oversight allows the VPN provider to sublease and sell the IP address to an unknown person or entity. This stranger may use it for criminal purposes, like fraud, scams,



*A Kingsmead Security study found that 84 percent of IP addresses aimed at two specific OTT vendors came from residential IP addresses.*

or hacking – or for geo-piracy. By hiding behind a legitimate domestic IP address, viewers can bypass VPN restrictions because streaming providers can’t take the risk of blocking genuine users.

Yet the failure to stop this form of geo-piracy puts streaming services at risk for non-compliance with rights holders’ agreements for content exclusivity. It also erodes service revenue if the content is easily available from alternate countries with lower licensing costs.

### A HIGH-TECH GAME OF HIDE-AND-SEEK

Pirate viewers who lurk behind residential IPs have a partner in mischief: the premium VPN vendors who provide those IPs. These vendors are just as eager to evade detection as the pirate viewers themselves and are constantly finding new ways to do so.

One way in which VPN vendors attempt to thwart detection is by targeting “high-value” OTT services with service-specific proxy servers. This means only the targeted OTT service can determine the IP address of the proxy server. All other OTT services — and VPN detection vendors — can only detect IP traffic from the VPN server.

Re-routing specific OTT services through proxy servers is a widespread practice. A simple web search for “best VPN for streaming” gives insight into which vendors might be targeting a specific service.

In a new white paper, “Residential IPs: A Rising

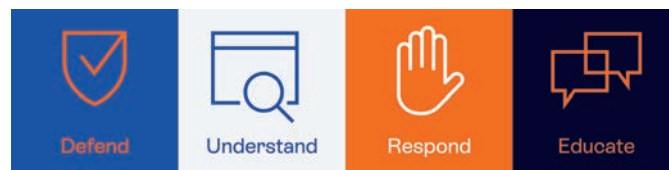
### Threat to Content Exclusivity,”

Content security consultancy Kingsmead Security analyzes these sophisticated techniques in-depth. The analysis found that 84 percent of the VPN IP addresses targeted at two OTT services were residential IPs.

Kingsmead notes its findings show that “leveraging residential homes is now widespread amongst VPN vendors, and hundreds of thousands of homes are now being actively used to route VPN traffic. This is an increasing threat to OTT services, who must be aware of the issue and take appropriate action.”

### FOUR WAYS TO COMBAT THE RESIDENTIAL IP THREAT

The use of residential IP addresses to bypass VPN detection may seem like a can’t-win situation. Detecting their use is difficult since they may be indistinguishable from genuine user traffic. And any attempts to block residen-



*The strategies for tackling use of residential IP addresses to bypass VPN detection.*

tial IPs runs the risk of excluding legitimate users, who may not even realize they’re hosting a proxy.

So, what can you do if you suspect residential IP addresses are being used to access your streaming service? The answer: quite a lot. No method of location masking — even hiding behind residential IP addresses — is 100 percent foolproof.

**Defend.** Make it difficult for a VPN vendor to target your streaming service with residential proxies. The Kingsmead paper describes several useful methods for doing so.

**Understand.** Gather information that is useful for

*Continued on page 130*



*James Clark leads GeoComply’s media and entertainment division, helping organizations use location to secure their services, reduce fraud, and protect their users. He has been involved with the ever-evolving challenge of secure media delivery throughout his career in the digital entertainment sector. James combines a technical understanding of security technologies with extensive experience working closely with businesses to fight piracy and fraud.*  
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# APPLES TO APPLES

The art of accurate comparison  
(of content security solutions)

**ABSTRACT:** When comparing vendors' services and solutions on a shortlist against each, a customer has a shopping list of the most important criteria. How they weigh each of these will ultimately decide the solution that they select. But where does the information come from, and how can they make sure that it's an honest and impartial representation?

**By Nik Forman,  
Marketing Director,  
Friend MTS**

The vendor selection process is something that organizations go through many times per year, each time they are looking to implement a new technology or service. In a B2B environment, the process usually involves a lot of research, and can take months or even years. The goal of the process is, of course, to find the most appropriate vendor of the solution being sought and consists of sequential whittling down of the list of potential suppliers until the most attractive remains. Are we sucking eggs yet, granny?

Throughout this process of whittling down, the buyer is making comparisons between potential solutions and suppliers, checking each supplier's offering against a list of desirables, which might include certain features, functions, pricing, ease of implementation, support capabilities, sustainability credentials and many more — these lists are usually long, and of course will differ depending on



***THE SLIGHT FLY IN THE OINTMENT (or maggot in the apple, in our case) is that not all questions can be answered in easily measurable terms; they may not have an answer that can be given in a specific unit of measurement. Some might require qualitative rather than quantitative data, for example when comparing reputations, or types of existing customers.***

the technology or service that the buyer is looking for.

Once you (the customer) have compiled the checklist, it should be just a simple task of submitting it to the various vendors you've shortlisted (this often forms the basis of a formal RFP process). They supply the answers to your questions, you compare how well each performs, and select based on that. Simple, right?

Well, yes. But no. To be able to make an informed decision based on the appropriate data, you must be sure that the answers you've received from all vendors are responding to the same question, using the same metrics. This may sound obvious, but technology solutions are multi-faceted, and different solutions may take a different approach to solving a problem. So, they may answer the questions positively (that is, they solve the problem you outline), but to reach that positive outcome, a vendor may be using a different metric, or a different scale, to another vendor.

As a content security example, let's use take-down of pirated content. Your RFP asks, "On average how many instances of pirated content that you discover does your solution disable/take down within 3 days?" (this is a simplified question for illustrative purposes).

Vendor A replies "100 percent." Vendor B replies "16,000." This might appear to be a tick in the box, for vendor A, of course, but how many streams has each vendor discovered and dealt with? Vendor A's monitoring technology might only uncover 20 pirated streams per event and disable them all, whereas Vendor B might discover 20,000, and disable 16,000.

In the example above the issue stems from using the most appropriate and consistent metric. This tells us that, wherever possible, it is important to quantify the

desired outcome for a given feature or service, then make sure that all vendors are responding on the same scale, in the same unit of measurement.

Of course, the customer might not always be aware of what is the best metric to use for a given problem, and this is where we as vendors should be able to help. While vendor honesty and transparency are crucial to helping the customer understand the full extent of their requirements, it goes without saying that vendors will try to frame their solution in the most positive light and may use the measurements that best enable them to do so; in an unsure situation, it's essential that the customer consults a range of suppliers, and uses the information they provide to form a judgement on the most suitable metric(s).

The slight fly in the ointment (or maggot in the apple, in our case) is that not all questions can be answered in easily measurable terms; they may not have an answer that can be given in a specific unit of measurement. Some might require qualitative rather than quantitative data, for example when comparing reputations, or types of existing customers. But even if an answer isn't given in numbers, it should be able to be backed up with evidence — and it's crucial that the customer does request access to this evidence as part of the process. Far be it from me to suggest that vendors might sometimes embellish or overstate, but ... suffice to say, it's important to always check and validate what you're being told.

#### **SOME OF THE CONTENT SECURITY APPLES**

So, apples to apples, like-for-like comparisons are critical. For video content security solutions, what might some of those apples be? Below are some real-world examples



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that we've encountered at Friend MTS during RFP response processes in the past:

**Robustness** (in particular watermarking). The very value of the content protected by security solutions means that pirates will do whatever they can to disable or circumvent this protection, and therefore the security itself has to be robust against attacks. When comparing robustness of, for example, watermarking, make sure that each vendor's solutions protect against all forms of attack: do they all protect against manipulation of watermarked content? Are they all able to track across stream switching? Are they effective against collusion attacks? Make sure that each vendor has a response to your full list of required protections.

**Watermark extractions.** There are many considerations around watermarking extraction — let's look at a couple we encounter quite often. The first is around volume: how many extractions do you require per month? This is a more complex question than it might seem, and the answer depends on the type of content you're seeking to protect, the value of that content (which impacts the amount of piracy you're likely to encounter) and the quantity and type of your distribution platforms. Low numbers (double digit) of extractions per month might be suitable for e.g., production content (screeners etc.) that are not likely to have significant amounts of source leaks. But we've seen vendors quote similar numbers for live sports environments, which, in our extensive experience, can require hundreds of thousands or even millions of extractions per month.

The second consideration in watermark extraction is duration. How long does it take to extract the watermark? This varies hugely with the different implementations of watermarking (e.g., A/B variant, client-side, client-composited), and understanding which will be most effective for your content, in your environment, is crucial. Likewise, the result of each vendor's extraction process is important: rapid extraction of a watermark is great, but is that extracted information viable enough to be used for subsequent remedial action? Again, we've seen vendors quote rapid extraction times, but the extraction is of insufficient quality to provide any further use.

Does it work, and does it work at scale? This question doesn't just apply to content security, it's a question we all need to ask about any solution we implement. Marketing materials and presentations are one thing, but they don't necessarily reflect usage. Is the solution already deployed at one or more customer sites? And are there customers using this solution who are of similar

scale and scope to you, the buyer? Ask for your vendors for reference customers that you can contact independently to see how they use a particular solution.

**Monitoring** — automated or manual? And what do I get for my money? Many companies offer content monitoring, and customers may also implement their own in-house monitoring systems. But the methods a vendor uses to search and locate infringing content may differ. Some are more automated than others, using technology to search and identify, others rely very much on manual methods, eyeballing content with large teams. Each has their pros and cons, but you should have a clear picture of the types of processes that vendors use to make a fair comparison.

In a similar fashion, the output from these monitoring processes may also be different. For a given price, how much feedback do you get? Will you receive regular reports? Dedicated resource to help you define business intelligence from the results? If a vendor comes in with a higher price than another, it might be that they offer a more comprehensive service.

**Pricing.** Finally, pricing. All the examples set out above will influence pricing. The more functions or services that a vendor provides, generally the more expensive it's likely to be. This doesn't necessarily mean that it's the right solution for you but knowing what you're getting for your money is key.

And what about discounts? We are all very fond of those, for sure. Are any services that you're investigating bundled as part of other services with a commensurate reduction in price? That's great of course, but if you're comparing this against a vendor who isn't offering a bundled solution, make sure you split out the pricing for this component so that you can compare specifics. And it's always worth asking, if a vendor is heavily discounting one component of a bundle to reduce the overall price, what does that say about how that vendor perceives the component?

These are just a few considerations in the weighing-up process. There are a huge number of others, and this makes it a tricky and time-consuming exercise. But these are generally expensive purchases, which affect operational margins, revenue, subscriber churn, brand value — in fact most aspects by which a business measures success. So, it's important to get it right, and this starts with knowing what you're asking (and why) and understanding how the answers of each potential vendor relate to those of others.

When you're shopping for apples, make sure you look closely inside every basket. ■



Media and game providers should consider security not only to protect their solutions but also to protect their users' privacy and company reputation.

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# TWO KEY TRENDS THAT WILL SHAPE THE FUTURE OF YOUR SECURITY TEAM

**Transition to a risk-based approach for security and focus on general scalability**

**ABSTRACT:** The world changed when the pandemic hit in 2020, leaving organizations unsure of how it would affect the future. Security leaders may have found themselves wondering if their long-standing business approaches, processes, and tools could withstand the changes brought on by the pandemic. Fast forward, and the answer to those thoughts is both yes and no. Yes — because they have helped organizations stay afloat as they navigated change. No — because the world continues to evolve, and we need to keep up.

**By Mike Johnson, Chief Information Security Officer, Fastly**

According to Verizon's 2022 Data Breach Investigations Report, compromised web applications were the primary attack vector of 2021, accounting for roughly 70 percent of security incidents. This is a huge jump from 39 percent in 2020. Attacks on web applications can be attributed to the use of stolen credentials, exploit vulnerability, brute force, backdoor or C2, explore data and much more — however, the use of stolen credentials accounts for more than 80 percent of these attacks. As Rapid7 author Jesse Mack summarizes in a recent article, this large percentage emphasizes “the importance of user awareness and strong authentication protocols at the endpoint level.”

This rise we are seeing in web application attacks is without a doubt directly correlated to the challenges we have been facing in our industry. While we can all agree this has brought uncertainty and a need to adapt, it has also brought unexpected opportunities for security leaders to pause and reflect on how our organizations were affected, and identify what changes are needed to be successful in the future.

After many conversations with fellow industry leaders and our own security team here at Fastly, I've found that there are two key trends we





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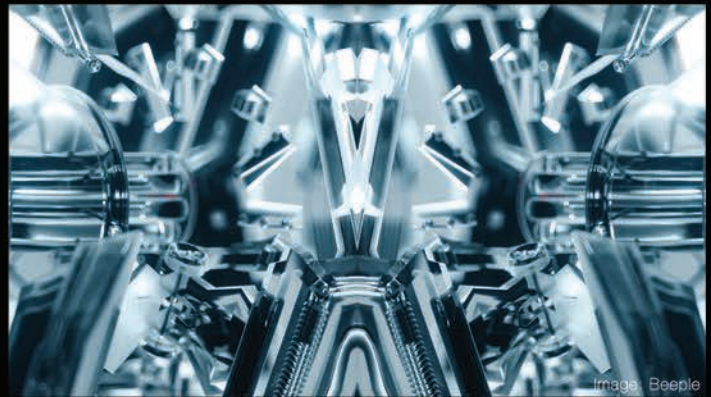


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all need to keep an eye on: transitioning to a risk-based approach for security and focusing on general scalability. In this article, I'll share my thoughts on how these two will shape the future of security in the next year.

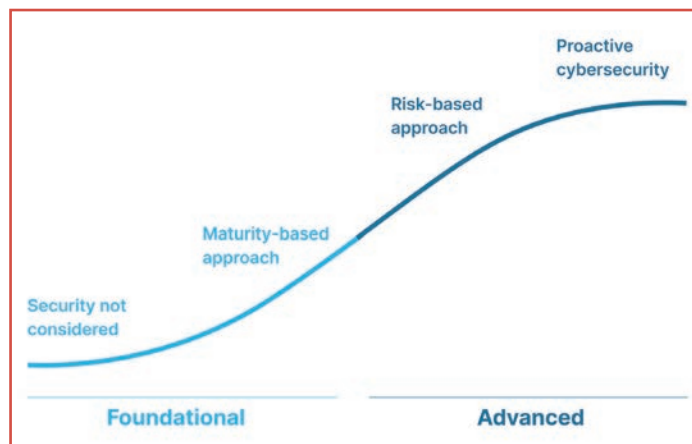
### THE CYBERSECURITY JOURNEY

A common question among my CISO peers in our secret squirrel communities is how we measure our security programs and report that out. Many of us will respond and say we use the NIST Cybersecurity Framework (CSF) and examine each function and assign a maturity score (using a simple 0-5 interpretation derived from the Capability Maturity Model (CMM)). This is an improvement beyond the way we used to answer the question with a "huh?" Moving from the old non-way of measuring our programs to using CSF was a positive step within an overall journey of how we think about our cybersecurity programs.

This first stage of the journey meant that security wasn't being considered. There was a lack of awareness and capability within the organization. From there, most organizations move on to what came before the risk-based approach: the maturity-based approach I mentioned. The good old maturity-based approach focuses on achieving a specific level of maturity by gradually building capabilities. We must acknowledge that the maturity-based approach is still being used and is considered the norm for some organizations. Looking forward, however, this will not be adequate, as it means security leaders are wearing blinders and focusing solely on meeting that targeted maturity score.

According to a 2019 McKinsey & Company report, "The most sophisticated institutions are moving from a maturity-based to a risk-based approach for managing cyber risk." While the maturity-based approach can work for organizations that need to build everything from the ground up, it will run into some key issues:

■ **Unmanageable growth of control and oversight.** *Organizations that grow organically will start to see their analysts become outnumbered by the volume of applications, resulting in unchecked monitoring.*



*The approach to cybersecurity has evolved.*

■ **Inefficient spending.** *Organizations attempting to track everything will lack the information needed to determine where spend should be properly allocated.*

■ **Demand overload for implementation.** *When team members are overloaded, their attention is spread across too many efforts, which leads to projects never being fully implemented.*

Therefore, we believe the next best step in the journey is to adopt the risk-based approach, which is a much more strategic approach and is vital to managing risk effectively and efficiently. This risk-based approach sets us up to naturally weave security resilience into our decision making, but we can't do that if we're not already baking risk into our thinking.

### TREND NO. 1: LEANING INTO RISKS

In the world of security, we're all familiar with and constantly talk about risk. But what we're now starting to see are security teams using risk to make decisions.

What exactly is a risk? The Cambridge Dictionary defines risk as "the possibility of something bad happening." As a security leader this definition pushes me to rethink all the shapes and forms risk could present itself in our industry. The OWASP Top Ten list of security risks immediately comes to mind, as it brings awareness to the most critical web application risks. In 2021, we



*Mike Johnson serves as the chief information security officer of Fastly, where he leads teams focused on the security of Fastly's network, products, services, and systems trusted by the world's leading companies. Prior to joining Fastly, Johnson served as the CISO of Lyft, and led detection and response at Salesforce. [info@fastly.com](mailto:info@fastly.com) @fastly*



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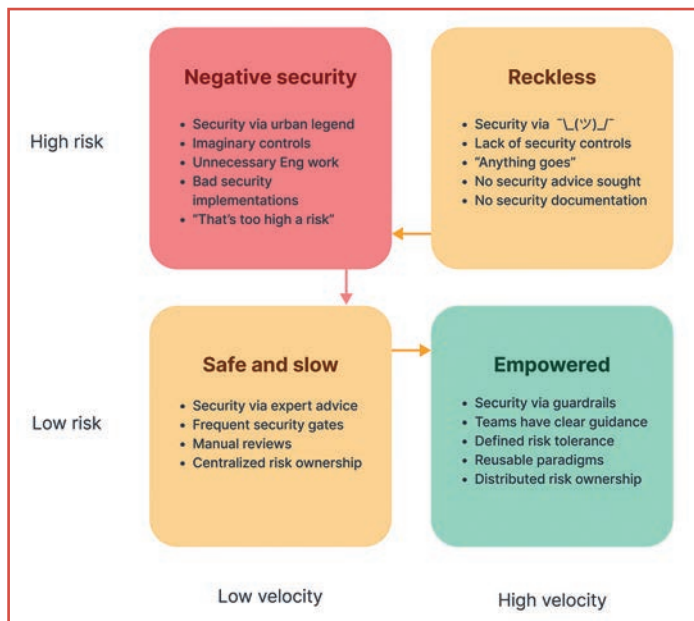
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*Don't be reckless with your security posturing.*

see everything from Broken Access Control rising to the top and Server-Side Request Forgery being added to the list for the first time. While risks will always be changing, we can be prepared to manage them better.

But why are security teams leaning into risks? It boils down to the maturation of the security profession itself. While security professionals have already been transitioning from an old school "department of no" mentality to a "yes, but" approach, there's more to it. As security leaders and teams, we regularly need to justify budget and why certain controls are required. This has led us to double down on the risk-based approach for security.

A risk-based approach helps solve two challenges that security teams face: prioritization and explanation. When looking through a risk-based lens, priorities quickly shake out and teams can decide what the most important work is. Our teams also need to be able to explain to our peer teams why a particular approach creates an increased probability of something bad happening. The OWASP Top Ten provides precise examples of where those bad things are happening and using those examples in discussions with peer teams helps reorient. For instance, Server-Side Request Forgery was not something many teams thought about a few years ago, but product security teams are certainly guiding engineering teams on weaknesses to watch out for.

Using risk for prioritization has become crucial to being efficient and successful within our team. When we have 30-plus different security issues to solve, risk will help us prioritize and understand which issue to solve first. This is true for not only security teams, but also

for the various other teams that we work with, such as engineering. We all need and can leverage security risk to help justify what needs to be worked on. While the risk-based approach to cybersecurity can be complex, there are many emerging best practices for successfully attaining it.

## TREND NO. 2: UNDERSTANDING THE POWER OF SCALABILITY

The second trend that I believe is emerging and affecting the future of security is around general scalability. When I ponder scalability in this context, I'm thinking about how a team's capacity grows to keep up with the needs of a growing company. Currently, there is a challenge around scalability and how security leaders will scale security (and non-security) functions and capabilities within companies. When it comes to scalability, security teams are faced with issues including:

- *Finding and retaining talent*
- *Hiring just to perform manual processes*
- *Keeping up with demand*

Achieving general scalability within a security organization helps us achieve two goals: outwardly to support the velocity of the company and inwardly to scale the functions of the security team. Let's dive deeper into each of these goals.

### LOOKING OUTWARD

To support the velocity of the company and maintain a decent risk profile, security teams' bandwidth must scale appropriately. Teams made up of subject matter experts are needed to maintain velocity but staffing up simply to turn the crank of manual toil will lead to an unsustainable team.

A scalability trick is to have your team focus on developing repeatable guidance that other teams can easily follow. With this guidance in hand, you now have other teams building securely from the beginning, allowing them to maintain velocity while reducing the likelihood of security issues or breaches. Empowering teams this way allows them to maintain team velocity, while companies maintain their security posture and the velocity of the company accelerates.

### AND LOOKING INWARD

We've discussed what attaining general scalability looks like when looking outward at the company, but

how does it look when you look inward? This brings us to focus on looking at ourselves and figuring out how we make our security teams more productive. To achieve this, we as security leaders must create meaningful work — which also reduces toil. As we continue to grow, we will be better able to support our efforts. With scalability as a first-class concern, we can prevent team burnout by ensuring our teams:

- *Actually, and realistically keep up with all of their work*
- *Aren't working extremely long hours*
- *Recognize how their work contributes to the overall goals of the company*

### VELOCITY VS. RISK

As we continue to look to the future of security, it is important to know that it is possible for teams to move both faster and safer. How is this achieved? - by understanding the interactions of velocity and risk.

At Fastly, we empower our company and all its internal functions by aiming for high velocity and low risk. With this goal, we enable teams by providing clear guardrails to work within (through clear guidance, as I mentioned earlier, as well as with reusable concepts to make things easier) and make sure that teams understand their responsibilities of risk ownership.

At a high level, we strive to practice our data governance and risk

ownership with the following, and we encourage you to refer to this when assessing your own practices within your company and security teams:

- *Data governance. A data governance program is key in assessing risk as it allows for informed decisions around risk tolerance*
- *Risk ownership. Clear security risk ownership along with defined tolerance levels enables distributed, educated decision making*

### HOW TO START FUTUREPROOFING TODAY

Preparing for the future can sometimes cause feelings of uncertainty and doubt. However, by understanding the tradeoffs between risk and velocity, you can redirect that into feeling empowered to shape your security teams for what's to come.

I hope that by sharing my thoughts and journey as an industry veteran and Fastly's CISO, I've been able to provide resources that will help you and your security teams as you continue to move along your cybersecurity journey.

Teams that evolve with a risk-based security approach and general scalability will be the leaders and faces of security in 2022, 2023 and beyond. Paired with the existing solutions today, your security teams will be armed with everything they need to provide safety and prevent attacks. ☒

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# SECURITY IS THE FUTURE OF BUSINESS GROWTH

**ABSTRACT:** Looking over the evolution of cybersecurity and technology, you can see how each major inflection point has produced required technology and with it, new security challenges. Just as old cash-based business models had their specific security challenges that were a requirement to function, now technology centric businesses have their own challenges to overcome.

**By Michael Nougier, Chief Information  
Security Officer, Director,  
Cybersecurity Services, Richey May**

 **MESA** Platinum Member

## Modern business must be secure on the consumer and B2B fronts

Since the 1990s, computers have become a requirement to enable a business to grow and be more effective and efficient business. Since the early 2000s, organizations NEEDED a website to drive growth. From 2010 on, social media drove growth in organizations and those that ignored it failed.

Fast forward to today where the average cost of a breach is roughly \$9 million in the U.S. Security is quickly changing from an expense to the bottom line to the enablement of growth for the future to, security is now becoming a core function to maintain trust in the modern business world.

The modern business needs to plan for security on two fronts: the consumer side and the business to business (B2B) side. Although it can be argued that today's consumer might be less security savvy given the sheer amount of spam opened, malicious apps installed, and the success of phishing efforts, they still do look for certain indications of security when buying online. Consumers identify retailers they feel they can trust and reuse them. Consumer trust is a combination of pricing/value, security of information, and confidence that if there are any issues the retailer will take care of them. These are the same things that B2B rela-



tionships are looking for: value for the money, security of any information, and confidence that any security issues will be handled quickly and properly.

Failure to build the right trust or a violation of one of these three items breaks that trust and impacts the revenue of the business in question. Take the highly publicized breaches by Lapsu\$. The entry point for these attacks was often through a trusted third-party vendor. Both the vendor and the target missed the compromise of a user account which allowed for the Lapsu\$ hacking group to gain access to company data. The data in question may or may not have been used for follow-on operations against other companies, but it was almost always publicly talked about by the Lapsu\$ group impacting trust for all involved. These situations were made possible by not having the proper security tools, controls, and policies in place to detect and quickly resolve an account compromise.

The Lapsu\$ attacks are a great example of how a lack of proper security can have a cascading effect on a business. It also highlights a shift in the need for security awareness to security culture. The typical internal phishing campaigns and annual security awareness trainings are just not enough anymore. This process has lost its luster as many employees just view it as a waste of their time and tend to get little to no value out of it. Instead, the concept of security needs to be ingrained not only as part of the business culture but also normal day to day activities.

Remember, you are also having to get rid of bad personal habits now. Most people have their own personal computer, smart devices etc. where security is approached with a view of “it won’t happen to me.” How they use those devices will translate to what they do at work; especially when it comes to mobile devices (the largest ignored BYOD segment). Getting them start questioning why an app needs the permissions it is asking for, why they would be getting a particular email (and looking for what is out of place) and knowing what to do when they get a multi-factor authentication request, they did not generate has to become a reflex

**ALTHOUGH IT CAN BE ARGUED that today’s consumer might be less security savvy given the sheer amount of spam opened, malicious apps installed, and the success of phishing efforts, they still do look for certain indications of security when buying online.**

and not just something they answer properly on a test once a year. Having this type of culture is not easy and it takes buy-in from the top down; everyone must be involved.

Security tools and the proper security culture, once implemented, can be marketed in the same way safety features are on a vehicle or business certifications are. They build a level of consumer trust (whether B2C or B2B) that can give you an edge over your competitors.

This is not to say that there is a need for a new certification or audit program to get another stamp on your website. This is more of a holistic approach. Once you build security into the basic framework of your business it can be leveraged as a tool to garner trust and increase your revenue (regardless of what you are securing). It is one of those items that can be brought up during new client communications and you would expect to find in the “about us” section of your website and the methodology portion of any proposals you put together. It lives there, because it is part of who you as a company are, and how you function as a business.

The overall effect of properly implemented and maintained security, when combined with a core security culture is significant. You end up not only reducing risks to your organization (and your customers), but also increasing market trust and your ability to not only sell your services, but the safety and confidence in their adoption. ■



*Michael Nouguier is the chief information security officer and director of cybersecurity services for Richey May. He has more than 15 years of experience providing enterprise information security and risk management services to various organizations, from mid-market to enterprise, with an emphasis on the media and entertainment and financial services industries. [mnouguier@richey.com](mailto:mnouguier@richey.com) @THENoogz*

# IS SHARING REALLY CARING?

The true cost of password sharing and what you can do



**ABSTRACT:** Netflix isn't the only streamer losing revenues to password sharing. In fact, the problem has intensified with nearly one in three users sharing passwords, a drastic increase in the last two years, according to Synamedia. This article will outline simple steps that can be taken to address the challenge.

**By Simon James,  
Senior Director,  
Product Marketing,  
Synamedia**

While Netflix continues to make headlines with its attempts to cut password sharing, it is certainly not the only streaming service feeling the heat from revenues that are lost because of credentials sharing. In fact, the problem is intensifying as users are tempted by the ease of sharing passwords to explore new streaming services and catch up with must-see content, whilst driven by financial pressures as steep rises in the cost-of-living force them to tighten their belts.

Recent research conducted by our piracy intelligence team found that each shared account serves approximately 2.75 households and can consume as much as 177 percent more content compared to honest viewers. This means shared accounts disproportionately weigh down on an operator's infrastructure costs as well as constraining their ability to invest in new content and remain competitive.

Over the last couple of years, the problem has intensified, with

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**IF VIEWERS CAN'T FIND A FRIEND OF FAMILY MEMBER** *willing to casually share their credentials, then they turn to purchasing stolen credentials from fraudsters through social media or online forums at a price that's well below the market rate.*

password sharing increasing from a previous average of 12 percent of viewers up to 30 percent now, according to our own monitoring of the situation.

For Netflix this translates into 100 million viewers piggybacking for free on paid subscribers. To turn these free riders into paying customers, in August 2022, Netflix started testing a new concept in five central America markets where it charges subscribers around \$2.99 a month if their account is being used outside their primary home for more than two weeks. It detects sharing using a combination of IP addresses, device IDs and account activity on mobile devices not through a VPN. After two weeks of sharing without payment, it restricts service access.

#### WHAT DOES THIS MEAN FOR THE BOTTOM LINE?

Variety has quoted analysts saying that Netflix could add \$1.6 billion in revenue per year by charging all password sharers additional fees, even considering the many illegal users who would instead choose an alternative free, ad-based service.

At Synamedia, we have built a calculator to help service operators quantify the positive impact of tackling credentials sharing on the bottom line, even assuming that not all sharers are willing to take out a subscription. For example, a provider with 1.7 million subscribers paying \$8 a month could increase revenue by \$1.6 million annually by blocking unauthorized users.

#### SO, WHY NOW?

The impetus for change is in part that shareholders expect streaming providers to continue to generate subscriber and revenue growth each quarter, but the

reality is that subscriber numbers are now flattening — or worse declining — in some markets. We're witnessing a saturated market in the grip of post-pandemic subscriber fatigue, where users are considering alternatives to paying for streaming services.

Ultimately, this is resulting in an increase in all forms of video piracy. Credentials sharing is easy and has not always been perceived as illegal since Netflix and others used it for years as a form of marketing. If viewers can't find a friend of family member willing to casually share their credentials, then they turn to purchasing stolen credentials from fraudsters through social media or online forums at a price that's well below the market rate.

#### WHAT CAN YOU DO?

While Netflix's approach has garnered headlines around the world, there are other actions that service operators and content owners can take...even simple ones to help save revenue and convert sharers to paying subscribers.

It's important to start by understanding the impact sharing is having on your bottom line. By figuring out the volume of illegal sharers on your service, you can measure the burden on infrastructure, the negative impact on reputation, and the number of lost paying subscribers.

One simple action that can immediately reduce sharing is resetting subscribers' passwords. One operator we work with proactively reset subscriber passwords and notified each subscriber of their new password. This action resulted in an immediate reduction in sharing of nearly 40 percent.

*Continued on page 126*



*Simon James is senior director of product marketing at Synamedia. Prior to Synamedia, Simon led product marketing and sales engineering teams at Applicaster and NeuLion (Endeavor Streaming) working with customers including OSN, UEFA, and the English Football League. to launch their direct-to-consumer OTT services. [sjames@synamedia.com](mailto:sjames@synamedia.com) @SynamediaVideo*



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# PATCH PERFECT?

Creating patches can be fast work. Deploying them in a timely manner, not so much

**ABSTRACT:** Two or three major cybersecurity breaches occur each month, e.g., Oktapus and Apple in August 2022. Creating patches can be fast, but the discipline of deploying them in a timely manner can be slow. Convergent highlights the speedbumps of rollout and why this is often an overlooked topic.

■ MESA Platinum Member

**By Mathew Gilliat-Smith, and EVP,  
Jason Shea, Senior Director App,  
Cloud Security, Convergent Risks**

Most of us are guilty of not having applied software updates on our Macs and PCs as soon as they arrive. Some updates contain a myriad of items including enhanced features, bug fixes and security patches. In the past, providers have been guilty of camouflaging security enhancements within a general update, hoping the recipient won't notice. Hopefully standards are higher now and reputable providers should be precise about what the update or patch contains.

Physiologically we assume that software updates are going to interfere with our work, cause unwanted downtime or even make us lose something we've been working on. This probably stems from the days when updates always required a full system reboot.



**AT CONVERGENT, WE FIND** *that in cloud security assessments we undertake for our customers common findings include no formal process for patching of virtual servers; or there is no vulnerability scanning tool in place to scan across the pipeline and hence no way to verify that build/patch security is taking place; or sometimes there is a patching plan in place, but the patches aren't being installed.*

There was never a good time to break into your current task and the update got pushed to the bottom of the to-do list. It's certainly still the case in the creative community that patches don't always get deployed in a timely manner. One studio confided that while they insist that their vendors deploy patches promptly, the studio itself doesn't always follow its own advice.

The implication of not deploying a patch can be significant. In the M&E sector, creatives can sometimes be working on older OS versions because the editing application being used doesn't support more recent versions, sometimes known as "technical debt." As a result, known vulnerabilities are not being remediated through the OS upgrade cycle. Productions have been known to use end-of-life unsupported versions of a best-of-breed video editing application because they are utilizing a plugin that is no longer supported on the current release version of the editing application. A production with a two-year life cycle could be stuck on an unsupported system for its duration, missing out on key compatibility fixes, and placing both the user and their data at risk.

Two or three major cybersecurity breaches occur each month. Oktapus, Apple and Uber are high-profile examples. When attempts to maliciously exploit an application or service takes place, the vendor is compelled to strengthen its defenses against potential vul-

nerabilities and issue a security patch. A critical patch update is often a collection of patches for multiple security vulnerabilities for both the product itself but also its third-party dependencies included within it.

For known security vulnerabilities, if a prominent business has distributed a critical security patch to its customer base, it is in effect waving a big flag advertising that vulnerabilities exist. Attackers will safely assume that some recipients of the patch won't get around to deploying it on their systems in a timely fashion. Furthermore, the issuing of a patch carries dire consequences for those who do not apply it. Exploit developers will use new patches to locate what has been patched in the older version of the software. This, more often than not, leads the researchers to discover vulnerabilities that may have been previously unknown to them, and then use this new information to develop devastating attacks. This can give rise to high profile targets to be exploited by attackers for the purpose of exposing private data, inserting malware, or conducting ransomware attacks.

The mass exploitation of Log4J was caused by the release of exploit code before a patch was available. However, a patch was quickly released, and it then became a race between malicious actors and organizations' abilities to patch all vulnerable systems rapidly and comprehensively. This enabled criminals to ac-



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tively exploit the high severity Log4Shell vulnerability on servers allowing them to gain full control of affected systems. The library is used in millions of third-party applications and websites which meant there was a huge base of vulnerable systems which were easy to exploit. While the time to deploy patches was fast for most businesses, it dragged on for many months with others.

At Convergent, we find that in cloud security assessments we undertake for our customers common findings include no formal process for patching of virtual servers; or there is no vulnerability scanning tool in place to scan across the pipeline and hence no way to verify that build/patch security is taking place; or sometimes there is a patching plan in place, but the patches aren't being installed.

### COMMON REASONS FOR POOR PATCH MANAGEMENT PRACTICES

#### ■ *Poor endpoint management/lack of accurate asset inventories.*

One example of a breach that was caused by poor asset inventory began due to a company having unpatched internet facing servers that were forgotten about and went unpatched for years. Malicious actors compromised the servers and obtained root access which allowed them to move laterally until they had acquired full administrative access to the cloud account where the servers resided. All the cloud infrastructure was deleted, and it took days to recover the services within the account.

Unmanaged and unpatched user endpoints are as big a problem as unpatched servers. This is an especially big problem now that we're in a work from home, hybrid model where user endpoints often won't connect regularly to legacy management services sitting on corporate internal networks. These workstations often go astray and unpatched which can lead to compromise. BYO devices that are entirely unmanaged also exacerbate this problem.

#### ■ *Inability to secure downtime approval for business stakeholders.*

Infrastructure teams face this challenge regularly, however the root of this problem is twofold. The first issue is having several legacy and poorly architected solutions in production, that either are unable to be configured with high availability or are not immutable designed services or applications. If systems were able to be patched without downtime, there would be no need for business stakeholders to worry about incurring interruption of their services. The second issue is often a lack of support from executive management teams that understand and support the importance of the need for downtime on systems to patch older systems that are not highly available. Closer synergy between infrastructure and management teams to secure the buy-in from all stakeholders who understand they too have a responsibility to ensure their services are as secure as possible.



■ *Over-leveraged technology teams.* Hard-working, well-intentioned technology teams are often severely under-staffed and faced with the capability of just keeping the lights on. Deploying, maintaining, and operating patch management solutions and operational services are often pushed way too far down the priority list to be effective.

### HOW TO BE PATCH PERFECT

Security best practices are there for a reason and you ignore it at your peril. Patch management forms a key pillar of most security standards. One should deploy a centrally managed patch management system which is achieved by establishing and regularly reviewing a process to patch endpoints, servers, applications, virtual machines, network infrastructure devices, SAN, and NAS. For cloud workflows, you should deploy a solution to patch applications and operating systems on virtual machines as well as deploy a solution for updating application frameworks and libraries within container images. Even better, work towards designing immutable systems that are deployed from regularly patched "gold images" and deployed with infrastructure as code.

A good partner will work together with business stakeholders and executive management to find a suitable window to regularly patch systems and gain their trust and buy-in; nobody wants to see their systems and services compromised. In working to understand the challenges business stakeholders face, it will allow you to find common ground and work towards a solution together.

Try and work to retire legacy applications, services, and operating systems. Modern applications that no longer require downtime can be designed and deployed.

Build and operate a robust asset lifecycle management program. If you don't know what you have, you cannot protect it. Even starting with a spreadsheet, and effectively communicated processes is better than nothing. Working your way towards an enterprise grade asset management system with automated discovery along with a strong asset lifecycle program and processes is the ideal goal, but incremental steps can begin to improve security posture immediately. ■



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# STAYING AHEAD OF THE CURVE

The options to secure content are vast.  
Make use of all of them



*Photo by Robin Pierre /unsplash.com*

**ABSTRACT:** The increasing demand for video content underlines the need for additional streaming flexibility. But with global piracy costs representing up to 24 percent of lost revenue, it is critical to focus on minimizing vulnerabilities. This article explores the secure workflows and protections content owners can employ to fully protect their titles.

**By Joanna Syiek,**  
**Senior Directing, Marketing,**  
**Vision Media**

Film and television content requires intense investment of time and funds. Once content is created, studios and content owners must contend with various market pressures (including shrinking windows, consumer demands, and the need for high quality playback and bandwidth) as they find the audience for their titles. These demands have led to an ever-increasing pressure to tighten security measures to protect high-value content.

As those in the media and entertainment industry know, video piracy is not a new trend. In recent years, increasing economic pressure and the COVID-19 pandemic amplified demands for both licensed and unlicensed content. According to NERA Economic Consulting and GIPC, digital video piracy amounts to at least \$29.2 billion and as much as \$71.0 billion annually in lost revenues, representing overall revenue reductions between 11 percent and 24 percent.

The increasing demand for video content underlines the need for additional



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**WHEN IT COMES TO THE QUESTION** of what's next for screener security, it will be necessary to consider the modes in which audiences will be engaging with content. AR, VR, and MR technology continues to become more mainstream for consumers and the metaverse's development is clipping along at an accelerated pace.

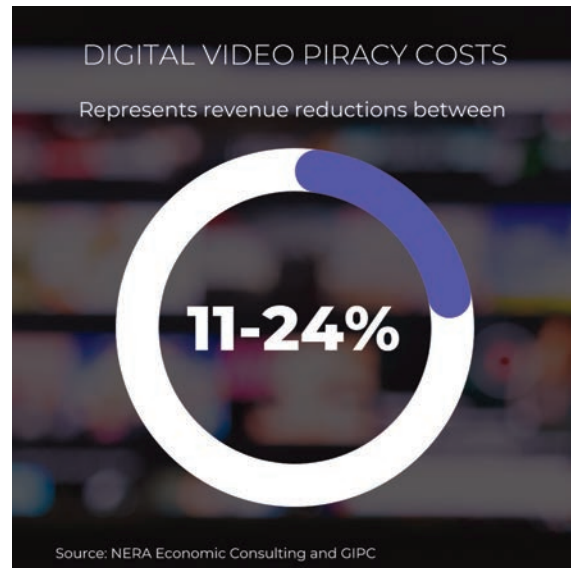
streaming flexibility. But with global piracy costs eating into content's revenue, it is critical to focus on minimizing vulnerabilities. Luckily, there are several secure workflows and protections content owners can employ in tandem to fully protect their titles.

### ROBUST DRM/CAS

One of the primary lines of defense against pirate attacks that video service providers need is either a strong layer of protection via either digital rights management (DRM) and/or a conditional access system (CAS). Both help prevent unauthorized access of video content from unauthorized users and hackers; CAS can be thought of as a transport protection mechanism while DRM is an asset protection mechanism. Many secure video solutions and OTT platforms are outfitted with protections that can perform both CAS and DRM functionality. Today, the differences between DRM and CAS are few, though it is likely that there will continue to be further advancements in CAS and DRM technology in the future.

### FORENSIC WATERMARKING

Session-based forensic watermarking helps protect content both before and after release. With this type of watermarking, each playback session features an embedded identifier which allows the content owner to establish a link between the playback session and the user. This level of additional forensic capabilities supplements security such as DRM or CAS by protecting decrypted content from escaping undetected, enabling identification and enforcement and makes it applicable to criminal proceedings should any illegal activity occur. And the appetite for watermarking has increased in



*The true costs of video piracy.*

recent years as well with more viewers watching at home and around the world, especially with the ripple effect from the pandemic. On Vision Media's platform, there was a 98 percent year on year growth in watermarking from 2020 to 2021 as studios adjusted to balancing viewer demands and security needs.

### RESTRICTED PLAYBACK WINDOWS

Another way to reduce unauthorized sharing is to establish strict playback rules when sending secure invitations to view content. This can include: 1. Limiting the viewing window during which a user can watch a title. 2. Establishing a set number of times a user can watch

*Continued on page 126*



*Joanna Syiek is the senior director of marketing for Vision Media. She has worked in the media space for more than a decade, helping to develop global marketing strategies and grow businesses at the intersection of entertainment and technology. [info@visionmedia.com](mailto:info@visionmedia.com) @jwsyiek*



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# ATTACKING REAL-WORLD APPLICATION OF TEE SECURITY



Most modern devices are equipped with TEE

**ABSTRACT:** In the last few years, Trusted Execution Environments (TEEs) have gained popularity in the Android ecosystem. Riscure analyzed the TEE security of a real-world application available in the market. For Samsung's TEEGRIS TEE OS as implemented in their Galaxy S10, we identify vulnerabilities and discuss techniques used by attackers to exploit them.

**By Jasmina Omic, Product Manager Services, Riscure**

The Trusted Execution Environment (TEE), a technology enabling developers to delegate security functions to a separate secure environment apart from the normal execution environment, has gained significant interest and is widely adopted by the payment industry, media, and entertainment as well as the Internet of Things (IoT).

Most modern devices including general-purpose computers, smartphones, and TVs are equipped with TEE. The main advantage of delegating such security functions to an isolated environment such as TEE is its logical and physical separation from the Rich Execution Environment (REE) which can be prone to insecure software. Developing secure TEEs is paramount for the secure application of TEE technology within the automotive industry.

Riscure experts and the rest of the security industry have investigated TEE security in-depth over the last few years. One of such investigations looked into how strong Samsung's TEE OS is and whether it can be compromised to obtain runtime control and extract all protected assets, allowing, e.g. decryption of user data. This research was conducted by Federico Menarini in 2019. You can find the full blog series named "Breaking TEE Security" on our website. All identified vulnerabilities were reported to Samsung and fixed at the end of 2019.

In this article, we share how we found vulnerabilities in TAs running in TEE-



The background of the entire image is an abstract, textured composition of green and blue particles, resembling a nebula or a microscopic view of a material. The particles are concentrated in the upper right and lower right areas, creating a sense of depth and movement. The overall color palette is a mix of dark teal, forest green, and deep blue.

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GRIS, and how we exploited one TA to gain runtime control and further escalate privileges and gain access to the full TEE memory. To start, let's understand what TEE is and how it works in OS first.

In short, there are three types of separations that a robust TEE is expected to implement both in hardware and software:

- *Separation between TEE and REE*
- *Separation between TAs and TEE kernel*
- *Separation between TAs*

The transition between secure/non-secure modes is managed by a component called “secure monitor.” This monitor is the primary interface between the TEE and REE and is the only component that can change the security state of a core.

While a fully isolated environment would be very secure, for it to be practically useful, it needs to communicate with other untrusted components running in Android. Communication between the REE and the TEE is done with the “Secure Monitor Call” (SMC). This instruction can be invoked by both worlds at EL > 0, which means that Android applications cannot directly initiate communication with the secure TEE. What normally happens is that the Linux kernel acts as a proxy and exposes a driver that can be used by apps to interact with the TEE.

The TEEGRIS kernel is a small component running in secure EL1. Even though it is small, it is not exactly a microkernel, and for instance, it integrates several drivers that can be used by TAs. Since the kernel is stored in plain text in the boot partition, it can be easily extracted and disassembled.

Although TAs in TEEGRIS can be easily disassembled to search for vulnerabilities, there are a set of protection mechanisms that prevent exploitation of those vulnerabilities some of which include ASLR, anti-roll-back and stack canaries.

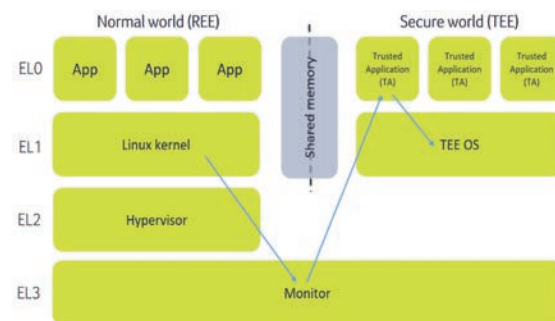
During the investigation, we overcame some used countermeasures in kernel and TAs. We found that by exploiting a type confusion in variable delivered to

**RISCURE EXPERTS AND THE REST OF THE SECURITY INDUSTRY** have investigated TEE security in-depth over the last few years.

TA enabled us to chaining three commands, we could obtain both read and write primitives in a particular TA which is a significant achievement since TAs are supposed to be secure and completely isolated from the untrusted Android OS.

### EXPLOITED MITIGATIONS XN (EXECUTE NEVER)

#### THE ATTACK WAS EXECUTED THROUGH MULTIPLE STEPS:



*The attack route.*

This countermeasure is used in both kernel and TAs, so data memory is never executable, and code is never writable. We, however, obtained arbitrary read using type confusion vulnerability, write, and code execution within the TA, but XN only allows reusing existing code.

### ASLR AND KASLR

We overcame this address space randomization of TAs and kernel by attempting multiple times as nothing prevents us from trying again to talk to the same TA, access the same random address, and see if we hit mapped memory. This can be repeated several times until the address we tried to access is mapped. Since the possible

*Continued on page 124*



*Jasmina Omic handles product manager services for Riscure and has worked in the security field for more than 14 years. In her current position she is driving security services, and focuses on providing guidance for Riscure customers, based on eight years of hands-on experience as a security analyst for IC and embedded devices, working under different certification schemes and testing approaches. [inforequest@riscure.com](mailto:inforequest@riscure.com) @Riscure*



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# PROTECTING LIVE SPORTS — TIMING IS EVERYTHING

Make finding and accessing  
live sports content easier

**ABSTRACT:** A perfect storm of economic challenges, growth in OTT streaming services and technological advances place our industry in the center of delivering live sports to consumers while protecting revenues and rights from piracy. Like any championship team, a collective effort is required to proactively protect valuable live sports content.

By Rafael Rivera, Solutions Marketing Manager, NAGRA

A recent Forbes article noted that the WTO, World Bank, and IMF have each revised economic growth expectations for the year. The economic environment is top of mind for consumers and major businesses around the globe, so it comes as no surprise that everyone is adapting accordingly.

Luckily, for a sports fanatic like me, the most wonderful time of the year is here and brings welcomed distractions. With the NBA and NHL seasons, college and professional football, World Cup football (yes! Costa Rica is in the field) — the choices are limited only to the amount of time I'll be able to dedicate to the couch.

With live sports playing an integral role in the day-to-day lives of people around the world, the business of sports cannot be ignored. From consumer behaviors and education to the challenges and solutions presented in live sports piracy, there is much to consider for a winning strategy.

## CONSUMER IMPACT AND AWARENESS

Given the economy and inflation, the reality is that consumer resources aren't endless. The number of streaming video services available to consumers continues to rise. A March 2022 Kagan Consumer Insights survey revealed that U.S. internet households now use an average of 6.8 streaming video services. At some point, even the most rabid fan base will have to make decisions on their subscription and live event expenses.

Compounding economic circumstances is the issue of consumer confusion. With league rights expanding to multiple content providers, it's becoming a pain for consumers to keep track of where each event is airing. It shouldn't be this difficult to follow your favorite team, but unfortunately, that's become an event itself these days.

And the harder it is for consumers to figure out where the big event is airing, the more likely they are to utilize



**IT'S INCUMBENT ON OUR INDUSTRY to make finding and accessing live sports content easier. We also need to educate consumers on the economic impact of piracy in terms of job losses and economic growth.**

search engines to find it. This opens the door to illicit services that often look genuine to consumers. Enticing consumers means they quickly adapt their consumption behavior, thus creating a perfect storm of business issues for content owners and distributors. And ultimately, when faced with a well-branded pirate service, who wouldn't take up a deal offering every live sporting event for an attractive price?

It's incumbent on our industry to make finding and accessing live sports content easier. We also need to educate consumers on the economic impact of piracy in terms of job losses and economic growth.

#### **PROTECTING LIVE SPORTS IS DIFFERENT**

Why do we love sports? Because the live action is unpredictable and immediate. These same qualities are what make protecting live sports difficult. As highlighted during a CDSA Content Protection Summit featuring NAGRA, live sports have a time-criticality component when it comes to protection. The key is to do something to stop piracy during the live window of the content; otherwise, all the value is gone. Sending a takedown notice after the event is over is a flawed process. You won't see the piracy 4-5 days after the fact, as it only happened for the 90-minute live event window. Immediate action is a necessity.

#### **TECHNOLOGY CAN BE YOUR MVP**

Technology is available to help tackle illicit sharing before the loss of revenue becomes critical compared to content license rights. For example, NAGRA has developed Active Streaming Protection, a framework providing a holistic approach to address security gaps open to pirates. End-to-end protection is assured by covering devices, applications, service platforms and content delivery networks.

**Consider building your protection barriers to make life difficult for the pirates.**

■ *Actively fight piracy, disrupting pirate services at their source with secure playback and compliance, which supports all market-leading DRMs and NexGuard Forensic Watermarking.*

■ *Ensure your service is accessed by legitimate users only and protects against cyber threats with Access Control and Service Protection.*

■ *Utilize intelligence as a critical component to help focus your limited resources on the main hubs of the piracy problem. Services such as NAGRA Anti-Piracy can help with IP blocking with local ISPs to disrupt consumer access to pirate services. Still, more critically, components such as our Threat Intelligence service crawls the Internet 24/7, 365 days a year, gathering intelligence to fuel your investigative efforts and help prioritize anti-piracy resources towards the most impactful targets.*

#### **DRIVE ENFORCEMENT**

For broader efforts, or where piracy is already identified, NAGRA can provide the full support and analysis required for legal action. If you don't have the in-house staff or your team is already over-stretched, NAGRA offers Investigation Services to help drive enforcement action against crucial content and service piracy targets. Our lawyers, investigators and technical experts deliver comprehensive, industry-leading investigation reports based on more than 25 years of collective experience, including a proposed enforcement strategy. Collectively, we can implement the right solution to protect your content, rights, and revenues.

Our mission is to help operators protect live sports content across the pay TV and streaming industry to secure services and revenues. This continual dialogue means we understand the market's challenges and are ready to help. ■



*Rafael Rivera is the solutions marketing manager for NAGRA. He drives various solution marketing activities for the company and in his career has driven multi-discipline efforts targeting consumer and B2B industries, including integrated and digital marketing, lead generation, creative and content strategy, and internal marketing communications for companies such as Cox Automotive, Georgia Pacific, and AT&T. [DTV@NAGRA.com](mailto:DTV@NAGRA.com) [@NAGRAKudelski](https://twitter.com/NAGRAKudelski)*

# PROTECTING ASSETS AT IDC



**How one postproduction firm secures clients' IP**

*John-Moeses-Rauan / unsplash.com*

**ABSTRACT:** To ensure client material is protected and safe, security must always be top of mind, in the office and at home. That means adhering to industry standards to prevent and defend against unauthorized or unintentional access to client's intellectual property.

**By Michael Tosti, Director,  
Production Engineering, IDC L.A.**

As a bi-coastal, world-renowned production and postproduction company, International Digital Centre's team of global experts is always ready to fulfill every creative vision, from media processing to localization to digital distribution.

Currently supporting more than 80 languages, IDC's culture is one of building and maintaining relationships with customers, while fostering professional development and growth among our employees. This blueprint affords our highly motivated staff to provide customers with a level of personal service and attention that is second to none.

And at IDC, we realize protecting assets is of the utmost

importance. We take security very seriously to ensure client material is protected and safe. We have worked diligently to adhere to industry standards for preventing and defending against unauthorized or unintentional access to client's intellectual property in this era of evolving cyber threats.

We have implemented content security guidelines to address security concerns regarding all electronic and physical information within the company. Information security is considered to comprise the following three aspects:

**Confidentiality.** To ensure that information assets and services are only accessed by authorized individuals. Each employee is given unique usernames and must adhere to complex passwords to authenticate access. Multifactor authentication is implemented for email and VPN access from outside the company.

**Integrity.** To ensure that information assets can only be modified by authorized individuals and only in authorized ways. One way to protect integrity is to implement yearly cybersecurity training so that individuals can easily spot a threat when it occurs.

**Availability.** To ensure that information assets and services are accessible to authorized individuals at the appropriate time.

IDC participates in cross-studio information exchange to keep informed of active and potential threats. This allows security leaders to know what might be happening to other studios and disseminate the information within the company. To guard against active threats, IDC is up to date on best security practices. Utilizing extensive firewall rules and air-gapping (the separation of networks to prevent a connection), we ensure that one breached network will not cross over into other networks. IDC has partnered with a security consulting company to assist in security standards across both our New York and L.A. facilities. They also perform

monthly external scans to detect outside exposure. This includes a yearly extensive penetration test for a more thorough inspection. Furthermore, IDC has formed a relationship with the local FBI cybersecurity team in case of a security event. This way, IDC has a contact to reach out to for investigation, remediation, and damage control.

Cybersecurity is not only about the workplace, as safeguards should also be applied to the home network as well. Your home network should be treated the same as the workplace environment. Anti-virus software helps protect your computer against known viruses, so you may be able to detect and remove the virus before it can do any damage. Since attackers are continually writing new viruses, it is important to keep your definitions up to date. For Mac users, this applies to you too, as more and more Macs are being compromised every day. Be sure to keep systems and software up to date. Operating system updates (patching) are very important as manufacturers are constantly addressing security vulnerabilities within the program. Software vendors release updates to provide, not only features but security enhancements as well. Hackers are constantly writing code to make use of these exploits to steal intellectual property, usernames, and passwords.

When connecting to a public Wi-Fi network be mindful of what activity you are engaging in. Do not conduct any sensitive transactions, including purchases, as there may be bad actors listening on public wi-fi networks and can capture the ethernet packets to harvest

*Continued on page 126*

**CYBERSECURITY IS NOT ONLY ABOUT THE WORKPLACE, as safeguards should also be applied to the home network as well. Your home network should be treated the same as the workplace environment.**

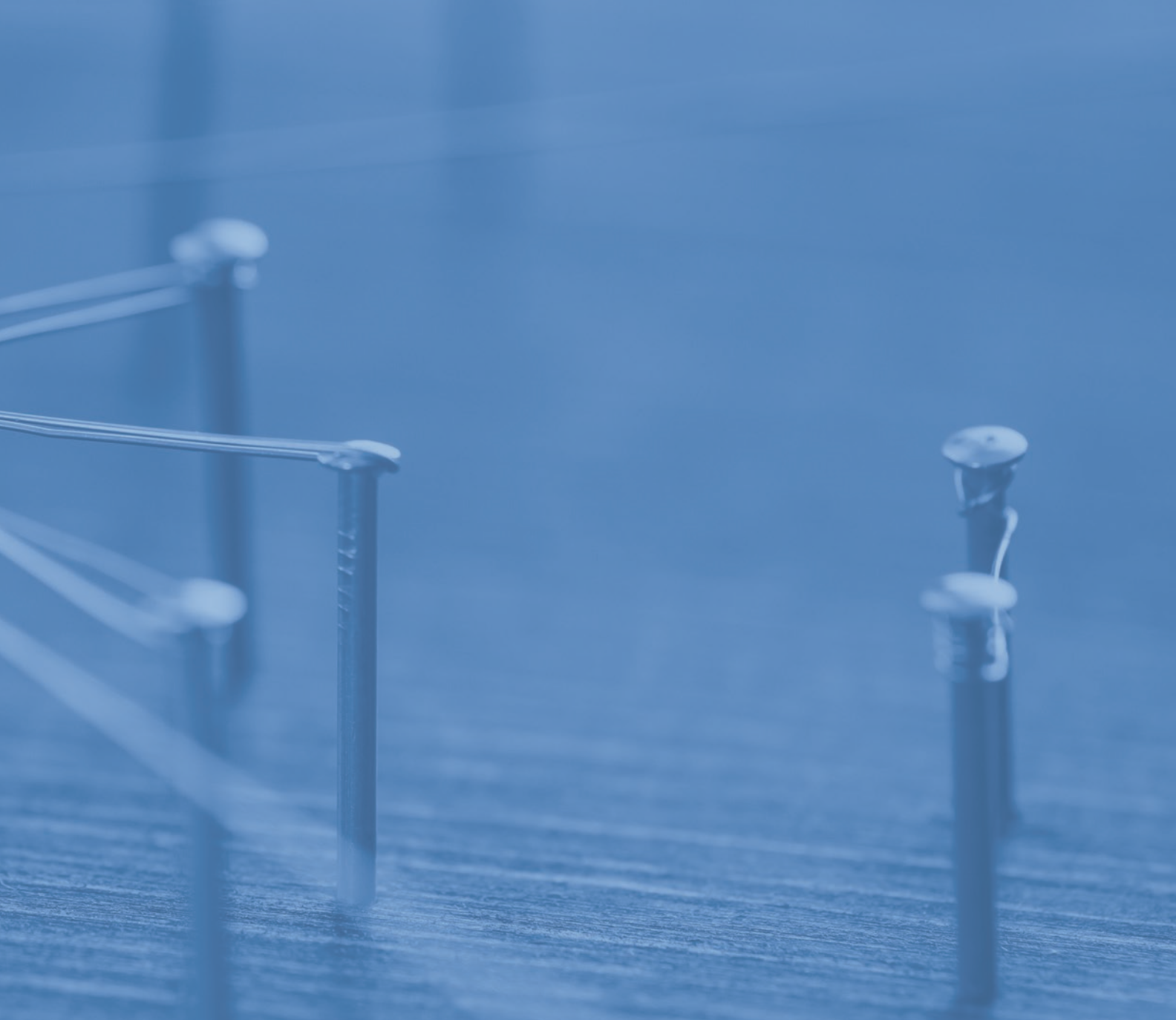


*Mike Tosti of the director of production engineering for IDC L.A. He is a production engineering expert with a demonstrated history of 31 years in the theatrical, broadcast, and streaming digital postproduction industry. Before IDC, Tosti spent 18 years as the manager of production technology at Technicolor Creative Services. [mike.tosti@idc-la.com](mailto:mike.tosti@idc-la.com) @mtosti*





# WORKFLOWS & THE CLOUD



Supply chain processes. Production workflows. Just getting through the daily distribution of digital entertainment content. Just in the past year much has changed in the way we track, access, move and store the mountain of assets we deal with in our industry. And the decentralization of workflows has leveled the playing field.

# TRACKING MOVING TARGETS: RIGHTS MANAGEMENT IN AN EVOLVING LANDSCAPE

**ABSTRACT:** It's hard to track a moving target. With today's entertainment industry and the distribution models that support it moving and changing at an unprecedented pace, how have the mechanisms we use to track rights and financials been impacted, and how will that shape the future of entertainment?

**Building tools to  
enhance creativity**



**By Jason Kassin, CEO, FilmTrack**

As humans, our ability to string together stories that captivate each other makes us unique among Earth's creatures. From the beginning of time to the present, people have needed to pass on events, imagined or real, and the medium, from petroglyphs to Netflix, has shaped how we tell those stories.

In a year or less, the pandemic has ushered in changes that otherwise may have taken years or decades to happen, specifically with the collapse of the theatrical window and how content moves to video on demand (VOD). Syndication is also no longer the holy grail in television as you can now conceivably make an eight-hour film by slicing it into episodes and making it a series.

The gap between episodic series and film is narrowing

to the point that the two are no longer separate industries. As a result, we now have A-list talent doing what was unthinkable just 20 years ago: migrating from film to television.

These changes not only impact storytelling but also affect how rights and the corresponding financials must be tracked.

Due to the rapid proliferation of platforms, an intense thirst for content has emerged. The scarcity of content has made the ability to license new and old content much more valuable. Consider what happened to the automotive industry during the pandemic – the supply dried up, used cars became expensive, parts were unavailable, and new vehicles sold above MSRP.



## *I DON'T WANT TO BE THE LAST GUY selling buggy whips, writing a rights management system for yesterday's distribution model.*

To understand the similarity with rights management, look at how the demand for video has exploded in just the past year or two:

■ *More than 80 percent of all U.S. households have at least one streaming subscription.*

■ The video streaming industry extended to \$72.2 billion in 2021 and is projected to reach \$115 billion by 2026.

■ Within one day of its launch in November 2019, Disney+ earned 10 million subscribers and, in three months, had 28.6 million users.

■ In 2020, over 500 hours of video were uploaded to YouTube every minute.

■ The global streaming market was worth \$372 billion in 2021 and is expected to grow nearly 20 percent annually until 2030 when the industry could be worth \$1.69 trillion.

In the olden days (three or four years ago!), you could license theatrically — onesies, twosies, etc. — but now you're licensing giant sets of content, maybe even your entire library. It's a fluid situation, and every single major player has its own platform. Those who are not creating original content are experiencing that thirst for acquisition.

As a result, knowing what's available and where the opportunity for profit is in your content library has become even more vital. For example, it was an easy question to ask whether some old film (or maybe not so old) was available in French for distribution in Europe. And that question was just as easy to answer. But now people are asking, "Tell me what's available for the French language across your entire library of a hundred thousand titles, and if they're not available, why aren't they, and when will they be?"

Those answers are not quite so easy since it requires a calculation of potentially billions of rows of data that need to be analyzed quickly, efficiently, and at scale. Add to that the increased complexity of episodic data, and

suddenly, there's a nesting hierarchy to the IP itself — series, season, episode, and maybe even clip. Moreover, with the proliferation of platforms, insight into what's available, when, and the corresponding financials becomes even more complicated.

Tracking all these moving targets with Microsoft Excel or a comparable platform built for yesterday's distribution model is absolutely impossible.

Licensing with these platforms is done at a vast and complex scale. As we see VOD platforms that are explicit to a particular language, territory combination, or type of content, we'll see an increased complexity of how those deals are structured. To manage this growing complexity, rights management systems must be flexible. Think of an accordion — sometimes, you need to roll it up, and sometimes, you must stretch it out.

How can we best manage today's distribution model from a financial basis? By using a system that serves as a general ledger that can accommodate all this complexity, track specific measurements, and tie it all back to a financial system. These modern mechanisms handle real-time information at scale, tie in the financial calculations, and efficiently communicate with accounting systems.

Storytelling has changed. The medium still drives the story, but consumers, not advertisers, drive the content. Subscriber counts, clicks, and views, not ticket sales, co-op advertising, and syndication are driving modern stories.

Broadcasting is now considered "last century." Today, we're microcasting, and there's a platform for everyone — animal lovers, chess nuts, and gamers who like to watch other gamers play.

I don't want to be the last guy selling buggy whips, writing a rights management system for yesterday's distribution model. Technology vendors must evolve with the industry and focus on solving tomorrow's problems. They need to provide systems that can handle the never-ending complexity of rights and connect directly to financial systems. ■



*Jason Kassin is the CEO and co-founder of FilmTrack. Since the company's inception, he has evolved it into an extensive ecosystem that encompasses content creation, distribution, rights management, and monetization. He is responsible for orchestrating the strategic development of FilmTrack products and solutions. [info@filmtrack.com](mailto:info@filmtrack.com) @filmtrack*

# MAY YOU LIVE IN INTERESTING TIMES

Streaming services have come to the realization that this is virtually a zero-sum game



**ABSTRACT:** The decline in traditional TV viewing, fueled by the change in behavior during the pandemic, has produced an unnatural rise in the number of streaming services launched in the last two-plus years. This, in turn, has accelerated the pace by which viewers are “cutting the cord” and reduced their time engaging with traditional/terrestrial TV.

**By Amos Biegun, Global Head, Rights, Royalties, Vistex**

Although the origin of this saying “may you live in interesting times” is debatable, this very overused phrase accurately describes our current climate. This phrase is very applicable to the media sector, which has been one of the most interesting. While I would love to share my analysis of the entire industry by its constituent parts, due to the brevity of this article I’ll focus on streaming services.

The decline in traditional TV viewing, fueled by the change in behavior during the pandemic, has produced an unnatural rise in the number of streaming services launched in the last two-plus years. This, in turn, has both accelerated the pace by which viewers are “cutting the cord” (disconnecting from traditional cable and satellite services) and reduced their time engaging with traditional/terrestrial TV. Initially, we saw a rise in the average number of services which households were subscribing to, but this was, in my opinion, a novelty bump and now we’re seeing that the true average is below three paid subscriptions per household, probably closer to two.

Where does that leave the streaming services, fighting for our attention and,

EMPOWERING ACCESS TO GLOBAL MEDIA

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more importantly, our wallets?

### SHOULD I STAY OR SHOULD I GO?

In a recent survey, the following three elements were at the top of consumers' minds when choosing to subscribe to, or remain with, a streaming service: affordability, content, and user experience.

#### Let's address each in turn:

■ **Affordability.** If anything, we've seen a rise in the cost of subscription fees from the major streaming services. This was either due to "teaser rates" going up after their launch (Disney+ being a prime example — launching at \$6.99 per month in November 2019 and due to increase to \$10.99 per month in December 2022 — an increase of more than 55 percent in two years); or the need to increase revenue (Netflix has increased its price by \$1 to \$1.50 per month yearly since 2019).

■ **Content.** Allow me to use another cliché: "Content is king." That's never been more correct than when services pull their content off rival's platforms to offer it exclusively on their own service. Which comes at a cost, as they forego revenue from a rival service whilst building up loyalty on their own platform. Additionally, content is very expensive, especially the kind that drives a consumer to jump from a rival service to yours. Some examples include Amazon's investment in the "The Lord of the Rings: The Rings of Power" series (\$250 million for the rights and \$750 million for the first series), and Netflix's ongoing investment in original content (2021 spend was roughly \$9 billion).

■ **User Experience.** This is a must-have feature, as finding content and recommendation tools need to be available for all to experience and utilize. It's also costly to maintain and adapt these features. However, I see this as the equivalent of online banking, meaning that I won't choose to work with a bank because it has online banking, but I will disqualify one from my list if it doesn't. The same applies to a good user interface.

One other key factor I shouldn't fail to mention is that mistakes by these services are being punished very

**STREAMING SERVICES HAVE COME to the realization that taking risks to increase subscriber numbers and revenue is lopsided in terms of risk vs. reward.**

heavily by the stock market. You only need look back at Netflix's Q1 2022 net loss of 200,000 subscribers (although not a true net loss as Netflix shut out 700,000 subscribers from Russia with the start of the war in Ukraine in the same quarter) which saw the stock tumble by 35 percent between two trading sessions.

Streaming services have come to the realization that taking risks to increase subscriber numbers and revenue is lopsided in terms of risk vs. reward.

### CHEERS FOR TIERS

So, what's next in the ongoing land grab for streaming customers?

One school of thought is that there might be consolidation, not in terms of acquisitions (services buying one another) but rather in subscription bundles. This highlights that the disaggregation of content by the services might have gone too far and the need to consolidate might be around the corner.

Another option is the introduction of ad-supported subscription tiers (both Netflix and Disney are well on their way to launching these tiers). These ad-supported options will address affordability, but will the user experience be impacted too much? We'll have to wait and see.

Additionally, the introduction of ad-supported tiers poses another headache for the streaming services, mainly in the procurement of third-party content. Up to now, streaming services have mostly licensed third-party material based on pre-agreed fixed payments (license fees) and no additional ongoing or residual payments. With the introduction of an unknown variable (ad revenue), it is likely that content suppliers will want a share of the potential upside that their programs

*Continued on page 120*



*Amos Biegun is the global head of rights and royalties for Vistex. With more than 25 years of experience in the enterprise software industry focusing on intellectual property rights management and royalties, Amos has led Vistex to be the largest supplier of rights management, licensing, and royalty processing software to the music, film, TV, brand, merchandising, and intellectual property industries worldwide. [amos.biegun@vistex.com](mailto:amos.biegun@vistex.com) @abiegun*

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# THREE REASONS A MULTI-CLOUD APPROACH IS A MUST



The new avenues for multi-cloud storage can yield immense benefits

By Whit Jackson, Vice President, Media, Entertainment, Wasabi Technologies

**ABSTRACT:** You may have heard reports that the production team of *Toy Story 2* almost lost the entirety of their movie footage due to accidental deletion, highlighting the importance of data backup in the media and entertainment industry. This article will explore new avenues for multi-cloud storage and infrastructure as well as the benefits of implementing it successfully.

In today's fast-paced, high-stakes world, productions can't afford to lose any raw footage, rough cuts or finished material before the final product is in the can. However, the media and entertainment industry is at increased risk for many reasons.

First, few industries store as much data as M&E given the sheer amount of video being produced at higher definitions and around-the-clock productions being kept on track. Second, most productions employ many people and contractors, have highly coveted digital assets being stored, and large budgets. All these factors make M&E ripe for theft, human error, and the steadily rising ransomware attacks we've seen in the industry, with notable examples.

You may have heard that the production team of *Toy Story 2* almost lost the entirety of their movie footage due to accidental deletion, or the ransomware attacks suffered by Sony, Netflix, and countless others. Even broadcasters can face serious legal and financial consequences — in the tens of millions — if a data breach occurs. All of this highlights the





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Traditional web application firewalls (WAF) rely on regular expression pattern-matching rules. They're difficult to manage and require never-ending rules tuning to eliminate false positives that can block legitimate traffic. The Fastly Next-Gen WAF leverages a fundamentally different approach, developed by Signal Sciences, that effectively detects and blocks malicious traffic without rules tuning, leaving your AppSec teams to focus on bigger problems. To learn more, [visit \*\*fastly.com/secure\*\*](https://www.fastly.com/secure)

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**4**

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importance of having a resilient data storage and backup strategy.

However, storing files on-premises can be limiting in terms of storage capacity and cost as well as time-consuming for companies to maintain and manage. M&E firms need a fail-safe backup strategy that ensures they can rapidly retrieve media work when things go wrong, effectively recover from attacks, and protect the property, and the bottom line.

To manage their data in a scalable and efficient manner, M&E companies should consider moving away from the traditional on-premise approach and toward the cloud — or multiple clouds. A multi-cloud approach combines public and private clouds to help minimize expenses, avoid vendor lock-in, protect their valuable content, and optimize performance and operations. Here's how.

### DIVERSIFYING BACKUPS

As part of a disaster recovery plan, M&E orgs can make themselves more resilient by having multiple backups of their content and data in the cloud. This often comes in the form of the “3-2-1” backup strategy which ensures that organizations keep three copies of data, with two on different media formats, and one of those being off-site. Immutable storage — in which data cannot be altered or deleted by anyone for a set period — is becoming a necessity as well but adds a critical layer of protection for valuable data.

By backing up content to the cloud, M&E companies diversify their backups and avoid a centralized “all eggs in one basket” content hub that makes it easier for a disaster to wipe out everything in one go. This ultimately helps mitigate the cost of a breach and helps companies continue to function during a data loss event, quickly retrieve footage and archives, and reduce downtime.

### RECOVERING LOST DATA

In the event of a ransomware attack, organizations that have their data backed up to the cloud can quickly eliminate ransomware by clearing its slate then restore and

*BY BACKING UP CONTENT to the cloud, M&E companies diversify their backups and avoid a centralized ‘all eggs in one basket’ content hub that makes it easier for a disaster to wipe out everything in one go.*

recover its data with minimal downtime. The cloud allows for simplified recovering testing by granting organizations easy access to their data, giving IT teams time to prepare and get critical intel into their security measures. Teams can quickly retrieve footage and archives should they lose any.

### MAKING THE MOST OF REMOTE WORK

Content and footage are shot all over the world, and as a result, there's likely an increasing need to transfer and store data at different locations to ensure it is rapidly accessible to everyone on the team working from home or on location. In this situation, storing data in the cloud is critical. While it is important for organizations to have the ability to store data locally, it can be very expensive and inconvenient to open multiple on-premises data centers in different locations. Moving data to the cloud enables organizations to run multitudes of data centers around the world due to its scale.

The best way to implement a successful cloud backup approach is to explore and consult multiple cloud options before making your selections to find the best fit for your needs. As the cloud industry has expanded, there are several storage provider options outside of the big-name players. This also means that there is greater diversity in what cloud vendors have to offer in terms of IT service packages. Take the time upfront to thoroughly vet your options and determine which provider offers the best mix of performance and cost to fit your specific needs. Doing so will not only protect your budget but give you the peace of mind that your valuable content and production information is safe, secure, and always available to you when you need it. ■



*Whit Jackson is the vice president of media and entertainment for Wasabi Technologies and has worked at the forefront of innovation in television production and distribution for 25-plus years. He's responsible for building out Wasabi's technology partner ecosystem and driving the adoption of the company's hot cloud storage service in the media and entertainment sector.*  
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# TRANSFORMATION IN MEDIA AMID A CHALLENGING INFLATIONARY AND RECESSIONARY ENVIRONMENT



This boon in content  
and services has  
only been made possible  
by massive investments  
in technology  
developments

**ABSTRACT:** As we look into the future, there is absolute certainty that further transformation and disruptions will take place in the content production and distribution business. This article discusses the recent and upcoming transformations in both content production and distribution; the business capabilities entertainment studios and distribution platforms will need to enable; and the SAP technologies that can help them succeed through the transformation.

By Jonathan Chen,  
Senior Director,  
Media Solutions,  
SAP

When Netflix introduced streaming video subscriptions (SVOD) 15 years ago, there were only a few competitors, primarily Hulu and Amazon. In the 15 years since, this segment of the media and entertainment industry has not only experienced tremendous growth, and change, but continuous innovation driven by technology to provide an ever-improving media engagement experience for consumers.

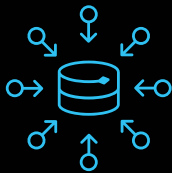
Today, consumers are spoiled with dozens of streaming services to choose from, can subscribe and unsubscribe with only a few clicks, can choose

between free, ad-supported, or paid services, and have access to a stunning volume of quality content. All this was made possible by massive investments in content production and technology developments.

What will this industry look like 15 years from now? Will everything move to the metaverse? Anything is possible. Competitors are already seeing the next trends. And they are already preparing and transforming to succeed (or survive) the next five years. Record high inflation, fear of deepening recession, consumer subscription fatigue, and a global



# Elevating the Value of Metadata



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of data and images from  
multiple sources



**Normalise, cleanse and enrich**  
data to enhance content discovery  
and viewer engagement



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**THE PAST 15 YEARS HAVE DEMONSTRATED** *that consumer behavior has driven media companies to transform and innovate. The cycle of transformation and innovation will certainly continue for the next 15 years: to create and deliver new media experiences, produce engaging content and IP, and enable new business models and monetization methods.*

push for sustainable businesses. Each studio, streaming service, or media platform will form their own strategy to address and tackle these trends, and with clear certainty, technology will be a key enabler of their strategy. At SAP, our Industry Cloud solutions for Media is ready to support and enable these strategies.

#### PRODUCTION INVESTMENTS AND FINANCIAL DISCIPLINE IN A HIGH INFLATION ECONOMY

According to Indiwire, the seven largest streamers will spend over \$50 billion on programming in 2022. In a high inflation economy, each film or TV episode will cost even more to produce. That \$50 billion might not get them as much as it did, compared to just one year ago. Focusing on financial discipline is imperative to maximizing media value. This entails investing (or betting?) on the right content that will engage with the broadest audiences and managing and controlling production costs.

While content decisioning can be informed by data science, there's still lots of art and gut feel. Technology can play a part to enhance the content decision workflow. From initial idea pitch to high level budget, to comparable analysis, SAP's Industry Cloud solution, Content Financials by Invenio, can capture all the data and enable the workflow of review and approvals for the greenlighting process. This captures all the data for the entire process, and for greenlighted projects, the data flows seamlessly to production finance project systems. And, even if the project is not approved, the data is still stored and easily accessible for query and analysis.

For production costs, do the studios and streaming platforms have visibility of where the money is spent? Do they have the ability to forecast, manage, and affect (reduce) that spend?

Additionally, more and more content is produced outside of the main studios, and across global territories to create international/local content. For these remote productions, the visibility of spend, and ability to manage

and forecast cash flow becomes even more of a challenge. The good news is that in the content production industry, there are specialized production solutions (EP and C&C) that can record and capture each dollar spent on payroll, goods, and services.

Furthermore, many studios run SAP's ERP systems (S/4HANA and ECC). Realizing that providing detailed production spend visibility is imperative to driving financial discipline, some content producers are already integrating their production solutions and S/4HANA finance ERP systems. This will give corporate executives additional data, insight, and visibility, in near real-time, to make decisions to manage the bottom line. Then, an additional step would be to leverage sourcing and procurement and spend management systems such as SAP's Ariba, Fieldglass, Concur, and SAP Business Networks. This would result in streamlined purchasing and payments processes, and drive cost savings by buying within the business networks.

#### CONSUMER SUBSCRIPTION FATIGUE IN A DEEPENING RECESSION

Across the macro economy, businesses large and small are already acknowledging and reacting to a slowdown in the economy — with hiring freezes, and for some with employee attrition. Consequently, consumers are also preparing. One area consumers are cutting back on is streaming services. According to Ampere Analysis, average U.S. households pay for between 3-4 SVOD services. Add to that streaming audio and other cloud enabled subscription services such as storage, the number and monthly spend really adds up. With a bleak economic outlook, consumers are starting to cut back. Streaming platforms will need to find ways to make their platforms more sticky: better value, better content, more choices.

The two largest services, Disney+ and Netflix, will both launch a lower-priced AVOD service tier. This achieves multiple benefits. First, it provides consumers with a



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lower-priced, more affordable service tier, potentially becoming more “sticky” and reducing churn. Second, as Paramount+ has proven, its ad-based service tier grossed higher average revenue per user (ARPU) than the ad-free service with a higher price point, ultimately contributing to a higher topline. Third, it diversifies revenues.

New service tiers with revenue streams from both subscribers and ad buyers require back-end technology that supports different revenue streams. The complexities around billing, collecting, and reconciling cash are driven by the scale of tens of millions, and even hundreds of million subscribers, across multiple service tiers, 100-plus countries/territories, and over a dozen currencies. For advertisement revenues, a different set of complexities exist around revenue sharing and paying royalties. Managing revenue streams generated from both businesses and consumers requires a robust, flexible, and scalable technology. As part of SAP’s Industry Cloud for Media, our Billing Innovation and Revenue Management (BRIM) solution along with Convergent Mediation by Digital Rout has been proven to overcome this challenge of scale and complexity. BRIM and Digital Route have been automating millions of transactions daily, generating invoice/billing documents, creating posting, and matching/reconciling transactions for some of the largest media businesses over the past decade. All this, and delivering results with practically zero revenue leakage, fully auditable transaction records, and compliant reporting, all enabled with a lean support team.

#### TRANSFORMING INTO SUSTAINABLE MEDIA BUSINESSES

Production of a blockbuster film emits an average of 2,840 ton of CO<sub>2</sub>, with 51 percent of emissions related to transportation. It takes 3,700 acres of forest to absorb the equivalent each year. Content producers

(studios) are driving towards “green productions” by following best practices and guidelines such as Green Production Guide, published by the Producer’s Guild of America and BAFTA’s Albert.

Example practices include: reusing and recycling building materials for sets and switching to solar panels and batteries for clean power. Larger initiatives include using innovative technology like Sony’s Crystal LED, to simulate on-location settings inside a studio sound stage. This results in massive reduction of carbon emissions by avoiding long-distance air-travel by the production cast and crew.

For each studio, its portfolio of sustainability initiatives and activities across dozens of productions and business areas all need to be recorded, accounted, and reported — business capabilities and processes that can be enabled with SAP’s Sustainability Control Tower, and integrated as a “green ledger” into the financial S/4HANA ERP system.

The past 15 years have demonstrated that consumer behavior has driven media companies to transform and innovate. The cycle of transformation and innovation will certainly continue for the next 15 years: to create and deliver new media experiences, produce engaging content and IP, and enable new business models and monetization methods. Technology will continue to be a driver and enabler of transformation and innovation. SAP has partnered the Studios to help them transform and innovate as the industry moved from physical to digital downloads, to streaming on-demand, as well as supporting different business models from wholesale distribution and rentals to electronic sell throughs and subscriptions. SAP has supported and enabled this industry for over 20 years, and we will continue to drive this dynamic industry with innovative technology and solutions to enable further sustainable transformations in business models and media experiences. ■



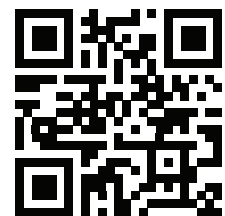
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# MEDIA PRODUCTION IS BEING DISRUPTED — IN MORE WAYS THAN ONE

And the reasons for this industry upheaval are different than any other business



**ABSTRACT:** The decentralization of content and workflows has leveled the playing field of the creative industry. This shift to the cloud has occurred in tandem with more affordable tools that are breaking open the floodgates for a new generation of creators, such as flexible SaaS cloud solutions replacing six-figure edit systems and servers; affordable high-speed internet unlocking unprecedented speeds for individuals; and modern 6K cameras debuting for less than \$3,000. The modern production industry is profoundly more accessible, diverse, and open than ever before.

**By Matt Cimaglia,**  
CEO, Co-Founder,  
Third Summit

In the past decade, numerous industries have been disrupted by seismic shifts in technology. Many of the emerging titans came with a single, often simple idea: Airbnb let everyday people rent out rooms, Uber allowed drivers to connect with people needing rides, Amazon delivered goods to your door within 24 hours. The elevator pitch was usually easy to grasp.

The media and entertainment world has arguably faced greater disruption than transit, accommodation, and retail — but there is no simple elevator pitch to explain how it changed. Nor is there a single

company that can take credit for revolutionizing the industry. Given how complex the professional creative process is, it's no surprise that the media industry was disrupted by a multitude of new technologies, opportunities, and players — seemingly all at once.

Reflecting on the shifts of the last decade, three pivotal trends emerge: the rise of cloud computing, mainstream high-speed internet, and affordable high-fidelity cameras. These can be thought of in terms of software, infrastructure, and hardware, respectively. The combined result has created a

## WHAT TECHNOLOGIES ARE NEEDED to facilitate today's productions? What transformations have occurred across content creation and distribution to facilitate globalization? What advanced workflows are being enabled by the cloud? And what are the data implications across this complex network of platforms?

competitive streaming industry, a massive spike in content creation and a greater emphasis on homegrown creativity and individual expression.

The rise of the cloud is perhaps the most impactful change to happen in the last decade — and it's also the slowest of these three pivotal trends, continuing today. Industrywide cloud adoption has taken two distinct shapes: asset storage and creative workflows. Cloud storage migration is an ongoing effort, as many professionals still rely on on-prem servers and mountains of hard drives to store and archive their content. Despite the obvious benefits of the cloud (security, scalability, flexibility, the ability to collaborate and share files quickly), convincing creators to change systems that seem to work is a hurdle.

From a workflow perspective, cloud computing has unlocked remote collaboration, taking the shape of software-as-a-subscription (SaaS) alternatives, including Slack, Zoom and content management systems like my company, Alteon.io. These applications form a critical bridge between users and the cloud: they are simple turnkey solutions that let content creators bypass cumbersome infrastructure setups and constant IT support. This marks a stark difference from the recent past, when servers required substantial upkeep and companies hosted their own email clients.

The result has been the decentralization of entire systems, pushing past geographic borders and physical limits. The pandemic exacerbated this shift, but the transition was inevitable. These cloud-based solutions are creating a more democratic, open, accessible world where creatives can connect and collaborate, while erstwhile maintenance costs are pushed where they belong — with the technology providers themselves.

All of this has been enabled by a pivotal shift in digital infrastructure: high-speed internet. As I write this, prewar apartments in New York City can hook up to fiber networks with gigabit speeds for less than \$100 a month. That kind of speed, at that kind of cost, was unheard of just a few years ago. While many parts of the country, and

indeed the world, still struggle with basic internet connectivity, the fact remains that a greater percentage of human beings are online — with remarkable speeds — than ever before.

From an industry perspective, the rise of high-speed internet, combined with the power of cloud computing, can redefine the entire creative process, leveling the playing field for smaller production companies and studios to compete with bigger fish. For consumers, both these technologies have given rise to the streaming era, which transformed the way we consume content—and the amount of content being created every year.

The third technological shift has been in hardware. This field has perhaps not been “disrupted” so much as it has evolved rapidly, delivering affordable 4K screens to households and 6K cameras to content creators for only a few thousand dollars. As with the shift in software, this upgrade has democratized the creative industry: movies are literally being shot on iPhones. You no longer need a \$10,000 camera and full edit bay to create an internationally distributed work of art.

It's easy to look at cloud-based workflows and fiber internet as keys to industry-wide decentralization, but hardware plays an important role as well. With affordable, professional-grade tools that address every aspect of the creative process, creators can bypass traditional avenues to get their work produced and seen. And they don't have to sacrifice camera quality for cost — unlike in the early days of digital cinematography, the results are stellar.

The key theme underscoring all these shifts is accessibility. By breaking old boundaries, inviting new creatives to share their stories, and offering a wider range of content than ever before, the industry is creating a more open, diverse and inclusive media ecosystem. Leaders in the media and entertainment space must embrace and support these changes — not just because it makes good business sense, but because it's the right thing to do, and the industry is better for it. ■



*Matt Cimaglia is the CEO and co-founder of Third Summit, whose flagship platform, Alteon.io, is an ecosystem for production professionals that simplifies cloud-based workflows, asset management and remote collaboration. An expert in cutting-edge and Web3 technologies with more than two decades' experience running an award-winning creative agency, Matt stakes his reputation on a relentless commitment to every project he takes on. [matt@alteon.io](mailto:matt@alteon.io) @alteon\_io*





# **SMART CONTENT**



Using artificial intelligence to address cultural sensitivities in content for global distribution. Employing cloud-enabled metadata processing to tackle content discovery and ad-insertion. The benefits of multi-lingual taxonomies in supporting localized concepts. The ways the industry is adopting new technologies to make content smarter are unprecedented. What's next?

# HOW CONTEXT PLAYS A SUPERSIZED ROLE IN SCENE ANALYSIS



**ABSTRACT:** Today's technologies that detect NSFW content in videos fall short in assessing film and TV for global distribution. General labels like gun, nudity, and alcohol lack specificity, context, and meaning. Spherex AI applies deep knowledge of cultural sensitivities and regulatory environments to move beyond content detection to content decisions.

## Technology and automation are necessities to meeting compliance for global distribution

By Teresa Phillips, CEO, Co-Founder,  
and Kira McStay, Senior Researcher,  
Spherex

Arguably, the most critical metadata signal for the distribution of film and television, content discovery, and ad targeting is an age rating. Local age ratings are required in most countries for distribution. Also, inaccurate age ratings pose significant legal and brand risks to content owners and streaming platforms when inappropriate content is made available to children.



**THERE IS NO ONE-SIZE-FITS-ALL APPROACH to compliance for global distribution. Despite the complexity that often requires human judgment, the sheer volume of content produced and distributed daily necessitates the use of technology and automation.**

Content classification policies, standards, and systems vary widely around the world. Regulators in some countries determine appropriate viewing age according to children's physiological growth and maturity. In other countries, decisions are based on moral, social, religious, or political interests. No two countries are the same.

Age ratings for film and television are determined by the presence of classifiable elements like alcohol and drugs, violence, sexuality, profanity, and more. But simply labeling a scene as violent or detecting nudity or other objectionable content is insufficient. Interpreting the context around these elements is often the deciding factor between two age classifications (e.g., PG-13/R or ages 12/15). Context is the circumstances that form the setting for a situation or event – and thoroughly explain it. Contextual cues for age ratings may involve the environment, the character's prominence, the plot's importance, and whether an objectionable event is glamorized or encouraged.

In assessing audience suitability for movies or TV shows, nowhere is the need for context more imperative than in scenes involving the use of illegal drugs. Unlike profanity or nudity, most countries consider all aspects of drug use, from cheeky references to vivid addiction imagery. Unlike the similarly universal category of violence, age ratings for drug use vary widely between countries: smoking a joint can result in a rating anywhere from All Ages to R21, depending on the country and the narrative. In the U.S., TV shows with drug use generally receive a TV-14 rating unless usage is explicitly disapproved, in which case, the TV show can receive a TV-PG rating if the scene is undetailed. Mexico does

not generally allow discussion of or references to drug trafficking, manufacturing, or selling until an age B-15 rating. Any approving references to the legalization of drugs or any of the above would raise the rating to C in Mexico. Denmark is the only country that does not rate drug use; it only considers addiction and whether it's encouraged.

Despite the various definitions and laws on illegal drug use worldwide, most countries agree that any encouragement to use those drugs merits an adult rating — or possibly a ban — for the movie or TV show. The range from “explicitly discouraged” to “normalized” parallels the age bands for most countries. Low age ratings are associated with explicit narrative discouragement, and higher age ratings are tied to either glamorization or normalization of drug use, depending on the country. The criteria for what counts as discouragement, some flavor of encouragement, or something in between does not stop at the individual scene of drug use: It encompasses the narrative as a whole, with consideration for immediate consequences of the drug use, the drug user's character arc, the ending of the work, and any moral messages implied along the way.

Whether explicit or implicit, discouragement tends to come as a consequence of drug use. If immediate and severe (e.g., an arrest for possession or an overdose), the discouragement is usually considered explicit, and the age rating can be lower. For narratives that borrow from traditional morality plays, dramatic, negative endings for the characters (see *Requiem for a Dream* or “Breaking Bad”) can also check the box for explicit discouragement. These works tend to be rated lower due to the

*Continued on page 120*



*Teresa Phillips is co-founder and CEO of Spherex, a global data and technology company revolutionizing the future of entertainment. The company's technology enables media and entertainment companies to culturalize their content to reach the largest audience possible, increase revenue and ensure brand safety. [teresa.phillips@spherex.com](mailto:teresa.phillips@spherex.com) @SpherexOfficial*



*Kira McStay is the senior researcher for Spherex. After starting out as a newspaper reporter, McStay spent several years in game development polishing release notes and squashing bugs. She started at Spherex in 2016 and has researched ratings rules in countries from Azerbaijan to Zimbabwe. [kira.mcstay@spherex.com](mailto:kira.mcstay@spherex.com) @SpherexOfficial*

# LOOKING TO OLD WAYS TO UNLOCK NEW VALUE

Attention to the metadata allows content owners and distributors to fulfill their true potential

**ABSTRACT:** As bundles and ad-supported services once again become the new normal for video distribution, the value of metadata cannot be ignored. Content discovery and ad-insertion are impossible without aggregated and enriched metadata. Cloud-enabled metadata processing is the key to ensuring video service evolution.

**By Peggy Dau, Marketing Director, MetaBroadcast**

The definition of TV continues to evolve as traditional broadcasters also make content available directly to consumers via branded streaming services. Pay TV providers deliver linear and streaming channels. Smart TV providers aggregate free ad-supported TV (FAST) channels. And some streaming services (e.g., Amazon Prime Video, Apple TV+) enable incremental subscriptions to other streaming services. Audience engagement is the name of the game and metadata is the key to unlocking value for the consumer.

As of early 2022, Nielsen listed 817,000 program titles across both traditional linear TV and streaming services in the United States. Many of these titles include hundreds of individual episodes. Now, expand that figure to reflect regional programming around the globe. The investment in content development continues to rise, but how do consumers navigate their video services to find the programs they want?

More importantly, how can video platform providers entice, engage, and retain subscribers as they all face the age-old challenge of subscriber churn. The current strategy is familiar: introduce bundles and advertising.

A Nielsen study indicates that 64 percent of global viewers want bundled streaming services. 46 percent say it is harder to find content because too many

services are available. The industry is responding by making bundles or the ability to bundle available to consumers.

By aggregating a variety of services, the provider hopes to appeal to the varied interests of the target household. For example, Disney's bundle leverages Disney-owned services to combine Hulu's variety of linear on-demand and streaming content, the branded assets of Disney's renowned vault, plus the all-important sports content of ESPN. The consumer household benefits from a cost-effective bundle and access to a wide variety of content.

Alternatively, Amazon Prime Video subscribers can add subscriptions to Amazon Channels such as Acorn TV, Discovery+, Paramount+, Showtime and more. In this case consumers benefit from consolidating subscriptions under one entity, Amazon, while building their own streaming bundle. In the UK, services such as SkyQ and Virgin Media TV enable similar bundles via their pay TV platforms.

The challenge in both scenarios is still federated content search, discovery and recommendation across the various platforms. The solution is the effective use of metadata. Metadata is used by platforms to classify content under different categories such as movies, TV shows, documentaries, etc. Further elements such as genre, artist, producer, and release date are added to help viewers search based on specific criteria. Video service providers must make use of metadata to enhance the way their viewers interact with their platform. When it comes to search, the platform's search engine will use the metadata information provided about each title to make it discoverable based on a viewer's search criteria.

Metadata is also the source for recommendation algorithms to identify a user's consumption patterns based on titles, genres, actors, and other metadata. With thousands of hours of content available, the goal is better and longer user engagement. This is an indication of the consumer's perceived value received from the video service.

The second business model being introduced by

**THE CHALLENGES OF search, discovery and recommendations still exist in this ad-supported business model, but a new challenge emerges. This is one of aligning the right ads to the right content and to the consumer's interests.**

almost every streaming service is that of advertising. While consumers once indicated that "too many ads" was one of the main reasons for discarding their pay TV subscriptions in the U.S., the aggregated cost of multiple streaming subscriptions is forcing consumers to rethink.

OMDIA research indicates that by 2027 revenue from online video advertising will surpass revenue from pay TV subscriptions, traditional TV advertising and online video subscriptions. It is no wonder that streaming platforms are pursuing ad-based models. There is also a belief that ads found in online video services will be more targeted, personalized and less frequent.

Consumer interest in avoiding increasing subscription fees in exchange for ads has given rise to free ad-supported TV (FAST) platforms. These services (e.g. Pluto, Roku, Crackle) are free to watch, providing both linear channels and on-demand programming in a single user experience. Revenue is derived from ad-insertion. The interest in FAST services has attracted new market participants to an increasingly crowded market — smart TV manufacturers. Vendors like Samsung and LG are integrating video services directly into the core of their user interfaces.

The challenges of search, discovery and recommendations still exist in this ad-supported business model, but a new challenge emerges. This is one of aligning the right ads to the right content and to the consumer's interests. Again, metadata plays a key role in enabling effective ad-insertion. The more robust the descriptive metadata about individual programs the more relevant

*Continued on page 124*



*Peggy Dau is the marketing director for MetaBroadcast and has been connecting the dots for tech companies enabling the media supply chain for 20-plus years. Her experience spans roles and projects with companies such as Hewlett-Packard Enterprise, Amino Communications, Avid, Grass Valley, Quantum Corporation and Microsoft. [peggy@metabroadcast.com](mailto:peggy@metabroadcast.com) @MetaBroadcast*



# THE WAY TO MULTI-LINGUAL CONTENT LOCALIZATION



Multi-lingual taxonomies can be used to support localized concepts

**ABSTRACT:** Content localization depends on language and imagery created specifically for regionalized markets. Localizing content text requires translation into one or more languages and possibly regional dialects. Managing concepts and textual blocks to serve to specific markets can be improved by using multi-lingual taxonomies to support localized concepts.

**By Ahren E. Lehnert, Senior Manager,  
Graph Solutions, Synaptica**

Marketing materials, quite simply, are a combination of words and images. As simple as this is, there is nothing simple about creating, managing, and retrieving unstructured and semi-structured content.

One way to add structure and information to unstructured content is to add administrative and descriptive metadata. Administrative metadata is typically applied to content to describe things like the creation date, the creator (author, photographer, etc.), and copyright and licensing information, just to name a few. Descriptive metadata tells us what the content is about, including things like topics, people, and things in an image, and other internal and external information providing additional information to text and images.

*TO HELP INFORM CONTENT STRATEGIES AND TACTICS, enterprises throughout the media and entertainment ecosystem are leveraging a wealth of data from different sources to achieve success in the face of competition.*

One of the fundamental challenges in managing content, including its metadata, is the human factor. Even a single content creator and manager is inconsistent, writing text using different terms and applying various metadata values from day to day. This challenge is compounded when content is multi-regional and multi-lingual. Because human content curators are inconsistent, one answer may be to automate content creation and metadata application. While automated techniques are improving, there is often no substitute for human-made content, or, at the very least, human-in-the-loop content creation and maintenance.

What can we do to add structure to content in a more consistent and manageable way?

### CONTROLLED VOCABULARIES AS METADATA

Controlled vocabularies have a long history in information management as sources for consistent terminology values. We see this in library catalogs, such as the Library of Congress Subject Headings (LCSH), and in science and educational fields, such as the NASA Thesaurus and the ERIC Thesaurus. Some publicly available and useful multi-lingual vocabularies include the General Multilingual Environmental Thesaurus (GEMET) and the UNESCO Thesaurus.

Controlled vocabularies can include flat lists, taxonomies, and more complex thesauri and ontologies. Controlled vocabularies are not just for academic and scientific publication, however. Hierarchical taxonomies have a place in the enterprise for content navigation and as sources for consistent metadata values. More pertinent for marketing content creation and localization are multi-lingual taxonomies supporting structures in one or more languages as a single source of truth.

Much like automating content creation and metadata tagging, automatic language translation has improved greatly. Despite these improvements, creating a one-to-one relationship between concepts in different languages isn't always possible, especially when trying to fit these concepts into hierarchical nestings which are equally sensible across languages and cultures. Because of these differences, taxonomy management systems do not typically support automatic language

translation. What they do support is the ability to create a taxonomy in a base language and allow the addition of labels in other languages.

For example, a single concept in the GEMET Thesaurus includes multiple concept labels (also called a preferred label) in several languages as indicated by the two-letter abbreviations. We can see the concept label

preferred label (SKOS) +	
وسائط سمعية بصرية	ar
audiovizual vasiṭələr	az
Аудио-визуална медия	bg
mitjans audiovisuaes	ca
prostředek audiovizuální	cs
audiovisuelle medier	da
Audiovisuelle Medien	de
οπτικοακουστικός τομέας	el
audiovisual media	en
medios audiovisuales	es
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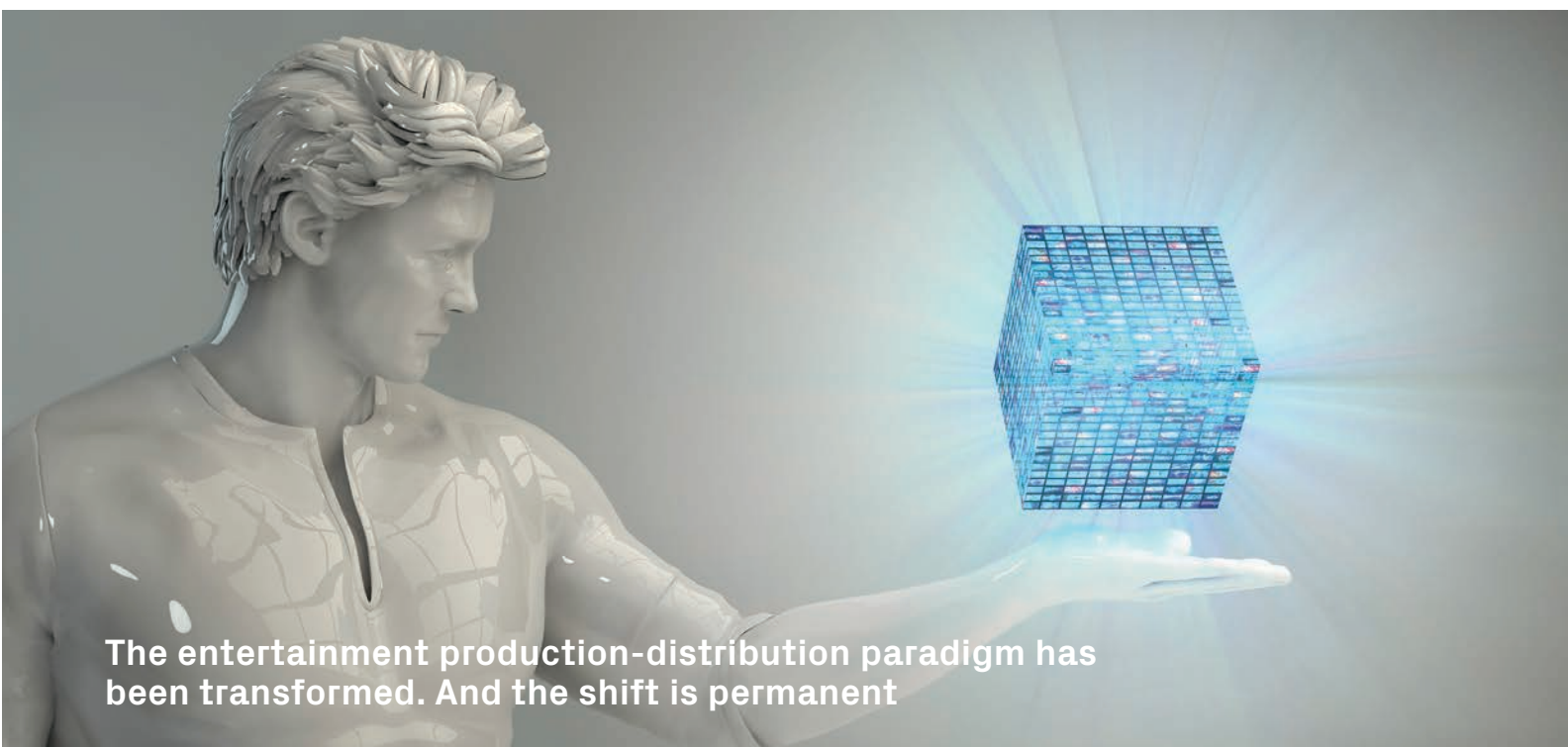
*Two-letter abbreviation labels for languages in the GEMET Thesaurus.*

*Continued on page 131*



*Abren E. Lehnert is senior manager of graph solutions with Synaptica and an information and knowledge management professional with more than 20 years' experience in taxonomy, text analytics, search, and content and records management. He has developed enterprise taxonomies and knowledge development and retrieval strategies as a consultant and full-time employee in a broad range of industries. [abren.lehnert@synaptica.com](mailto:abren.lehnert@synaptica.com) @abrenlehnert*

# THE NEXT WAY WE DO ENTERTAINMENT PRODUCTION



The entertainment production-distribution paradigm has been transformed. And the shift is permanent

**ABSTRACT:** Profound changes in the distribution model, coupled with significant advances in creative technologies, both accelerated by the COVID-19 pandemic, pushed the old paradigm to the brink and over the edge.

**By Daniel Kenyon, Co-Founder, Perception Grid**

The filmed entertainment Industry has been through many changes over the past 125 years; however, recent changes have reshaped the industry permanently. It's safe to say that the recent shift over these last three "pandemic years" represents the most significant change in the history of the entertainment industry.

A shift of this magnitude necessitates an immediate reassessment of the entertainment industry's "tried-and-true" creative and production processes. For years entertainment producers have been relying on outdated

business models and legacy audience consumption models for a little too long.

## INDUSTRY IN TURMOIL

Variety reported on a recent study that highlights the paradigm shift in stark terms. While the survey, taken at the height of the pandemic, revealed a dislike of public venues, it also highlighted some surprising changes in popular taste.

Additional evidence of the shift was highlighted in a recent article by Christopher Palmeri, writing for



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SCAN ME

*THE CURRENT PARADIGMATIC transformation is on another scale altogether, and the changes that have already taken place are profound. The emerging generation or next target demographic may never fully embrace, big-screen, lean-back viewing in the same way as previous generations.*

Bloomberg, which states that a “a multiyear boom in film and TV production, driven by media companies racing to sign up subscribers for their new streaming services, has come to a painful halt, giving way to firings, introspection and handwringing.”

While seemingly unprepared for this recent shift, the winds of changes have been evident for more than a decade.

Hollywood has always found a way to weather these massive shifts in the past. For instance, TV broadcasting once thought to be a death-nail for Hollywood’s feature films, eventually become another channel for feature length films, eventually driving cable subscribers to save Hollywood’s feature film industry through the long tail exploitation model. Digital cameras, initially seen as substandard, now afford creatives new capture luxuries that make for more flexibility, creativity, and better overall productions.

The current paradigmatic transformation is on another scale altogether, and the changes that have already taken place are profound. For instance: the new viewing audience is very connected to their content through their mobile devices. The emerging generation or next target demographic may never fully embrace, big-screen, lean-back viewing in the same way as previous generations. In fact, the next generation of big-screen, theatergoing movie-buffs may never materialize.

#### IN OTHER WORDS, AN INDUSTRYWIDE SHAKE-OUT IS UNDERWAY.

While seemingly unprepared for this recent shift, the winds of changes have been evident for over a decade. Procrastination, pervasive industry norms and a lack of Industry data intelligence all contribute to the slow pace of entertainment industry change.

This transformation, however, comes a massive, new

opportunity to engage viewers with highly immersive entertainment.

In 2009, the Virtual Production Committee was formed under the American Society of Cinematographers (ASC), the Art Directors Guild (ADG), Visual Effects Society (VES) and Previsualization Society, to explore how live-on stage computer graphics will change future movie production.

Production companies that have predicted and embraced the shift have already pivoted. They are benefiting from the increased creativity, viewer consumption pattern changes and most importantly, a better final production product.

One hidden benefit of the new approach is the generation of a dynamic foundation that includes automatic and repeatable processes, reusable assets, and improved data metrics or KPIs — all beneficial for future projects.

In addition, the explosion of spatialized 3D assets comes at a time when Hollywood and other studios are facing with declining revenues from theatrical, intense competition from streaming platforms, and, once again face disinter-mediation from data about “how viewers watch” their content, which the producers created.

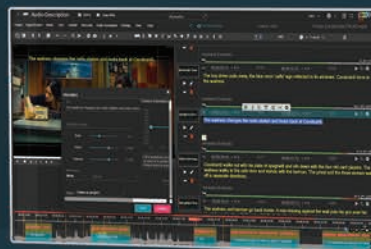
Viewer consumption habits, distribution model changes and production advances combined to drive this revolutionary, ongoing paradigmatic transformation. By paying close attention to what changed and what is working now, entertainment producers who embrace the shift and progress their business models, highly advanced production techniques including virtual production, and embrace the next generation of viewers, where and how they consume their content, will thrive.

The fallout for those production companies that don’t pay attention to the shift and respond immediately; will be

*Continued on page 128*



*Daniel Kenyon is co-founder of Perception Grid, a new type of asset management system for the next generation of media and entertainment. Kenyon has more than 25 years of experience in executive management, strategic innovation, and award-winning product strategy. He is a member of the board of directors at the California Film Institute-Mill Valley Film Festival.*  
[daniel.kenyon@perceptiongrid.io](mailto:daniel.kenyon@perceptiongrid.io) @daniel\_kenyon

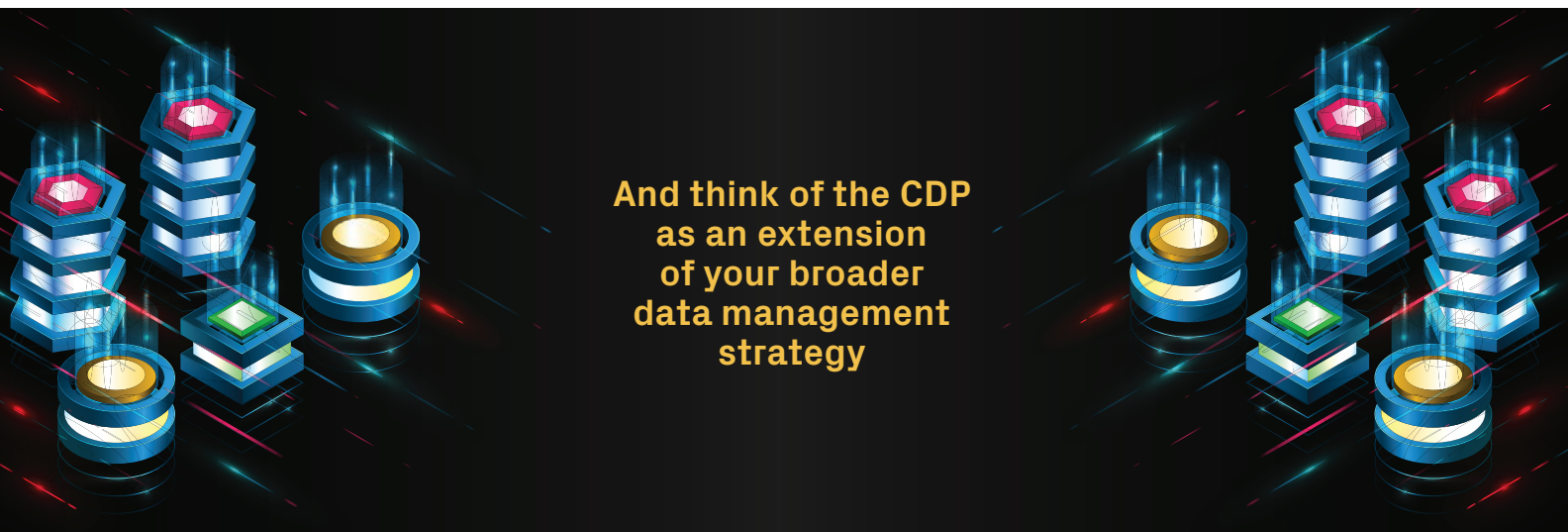


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# INTRODUCING THE COMPOSABLE CUSTOMER DATA PLATFORM (CDP)



And think of the CDP  
as an extension  
of your broader  
data management  
strategy

**ABSTRACT:** As we move toward a cookie-less world with customer expectations that entertainment will be available everywhere, companies that want to engage their customers effectively must build actionable intelligence on top of their first-party data. There are three challenges to achieving this, all difficult: build a rich, behavioral data set of customer interest and intent; then use that data to make meaningful inferences and predictions about individual customers at scale; and activate that intelligence across a myriad of customer touchpoints and marketing channels. As a result, many companies are turning to composable customer data platforms (CDPs) to bridge these gaps and overcome these significant challenges.

**By Dan Morris, Senior Industry Solutions Director, Databricks**

There has never been more competition than there is today when it comes to the war for attention. Whether it's video, news, games, audio, or even in-person experiences, consumers have more choice than ever before.

As a result, as companies vie for consumer attention, it's essential that they remain hyper focused on managing all aspects of the customer lifecycle, delivering an extremely personalized and relevant user experience, and ultimately meeting fans wherever they may be. That makes first-party customer data one of the greatest assets for a modern digital organization. Compounding the value of this data, the rapid rise of the privacy-centric consumer has led to a monumental shift away from third-party tracking methods. Organizations are now scrambling to implement a data infrastructure that, leveraging first-party data, can enable the personalized experiences that customers expect with every interaction.

Recognizing this need to use first party data for competitive advantage, many organizations have sought out a customer data platform (CDP) to construct a “single view of the customer” that they could then use to boost engagement and retention. These CDPs have traditionally included the following components:

■ **Data collection.** CDPs are designed to collect customer events from several different sources (onsite, mobile applications and server-side) and append these activities to the customer profile. These events typically contain metadata to provide detailed context about the customer’s specific digital interactions. Event collection is typically designed to support marketing use cases such as marketing automation.

■ **Data storage and modeling.** CDPs provide a proprietary repository of data that aggregates and manages different sources of customer data collected from most of the business’s SaaS and internal applications. The unified database is a 360-degree view of each customer and a central source of truth for the business. Most CDPs have out-of-the-box identity stitching functionality and tools to create custom traits on user profiles.

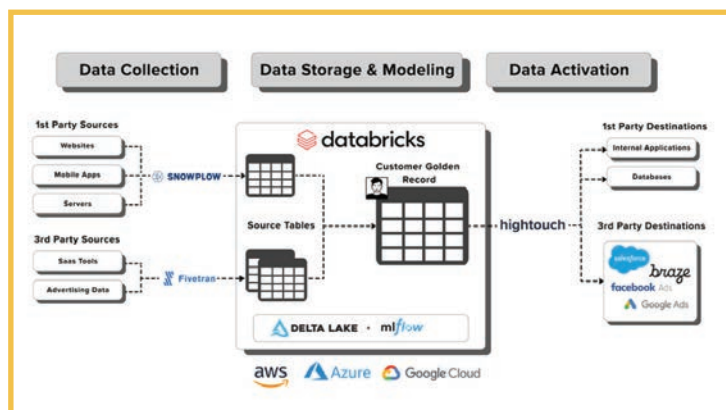
■ **Data Activation.** CDPs offer the ability to build audience segments leveraging the data available in the platform. Thanks to a wide array of pre-built integrations, these audiences and other customer data points are then able to be pushed both to and from various marketing channels.

Many companies continue to struggle with their CDP implementation, which in turn prevents them from maximizing the return on their investment. The root cause for many of the challenges that these companies face stems from treating the CDP as a standalone solution, off to the side of the organization’s data and tech stack. As a result, data engineers express concern about having to use ETL tools native to the CDP, analysts fear having to manage audience segment defi-

*RECOGNIZING THIS NEED to use first party data for competitive advantage, many organizations have sought out a customer data platform (CDP) to construct a ‘single view of the customer’ that they could then use to boost engagement and retention.*

nitions in multiple places, and data scientists question how they will use the data for use cases adjacent to the CDP and/or integrate their machine learning models.

The solution is to think of the CDP as an extension of your broader data management strategy, not a system that sits off to the side, disconnected from the organization’s core data platform.



## ENTER THE COMPOSABLE CDP

A composable CDP consists of the same components as a traditional CDP but is “composed” using the best-in-class product for each component, opposed to relying on a single solution for it all. Using this architecture there is no need to start from scratch. Instead, you start with the data that you already have in your Lakehouse and then use that data directly for activation with a tool like Hightouch. Additionally, using a tool like Snowflake, you can easily add in high quality, first party data for robust audience segmentation, and with Fivetran,



*Dan Morris is senior director of industry solutions for communications, media and entertainment at Databricks, and is charged with solution development, customer and partner engagement, and account support for some of the world’s most prominent organizations. Prior to joining Databricks, Dan was VP, Data Platform at Viacom, where he built and managed the data infrastructure used for addressable advertising, video quality of experience monitoring, product analytics, and marketing analytics. [dan.morris@databricks.com](mailto:dan.morris@databricks.com) @databricks*

importing return path data from marketing platforms is turnkey, making it easier than ever to monitor campaign performance.

#### BENEFITS OF A COMPOSABLE CDP

By harnessing the power of best-in-class tooling to create a composable CDP, there are four key benefits over a traditional CDP.

■ **Better data governance.** In today's privacy-conscious world and with ever-evolving data legislation, taking ownership and having full control of your customer data is paramount. A composable CDP provides you with full transparency, assurance, and auditability at each step of your customer's data architecture.

■ **Better results with better data quality.** Advanced personalization and segmentation of your campaigns rely on a consistent source of well-structured, reliable, accurate, explainable, and compliant behavioral data describing what customers are doing minute-by-minute. With a composable CDP, you can determine the events and entities that match your business and decide how your data is modeled for activation.

■ **Future-proof and modular by design.** Composable CDPs are future-proof by design. With every element in a composable CDP modular, you can choose the best-in-class collection, storage, modeling, and activation tools that fit the requirements of each of your teams. As the requirements of the business evolve, you can easily augment your existing architecture to meet the emerging needs opposed to implementing a new stack from scratch, which has high risk and cost to the business.

■ **Single source of truth across marketing and other teams.** With the lakehouse as the single source of truth for the composable CDP, all teams have access to the most comprehensive customer profiles and insights from across the business and can activate it through Hightouch with an easy-to-use UI and workflow. ■

*Want to learn how to effectively implement a CDP in your organization? Read the whitepaper: [dbricks.co/3mEQ2V](https://dbricks.co/3mEQ2V).*

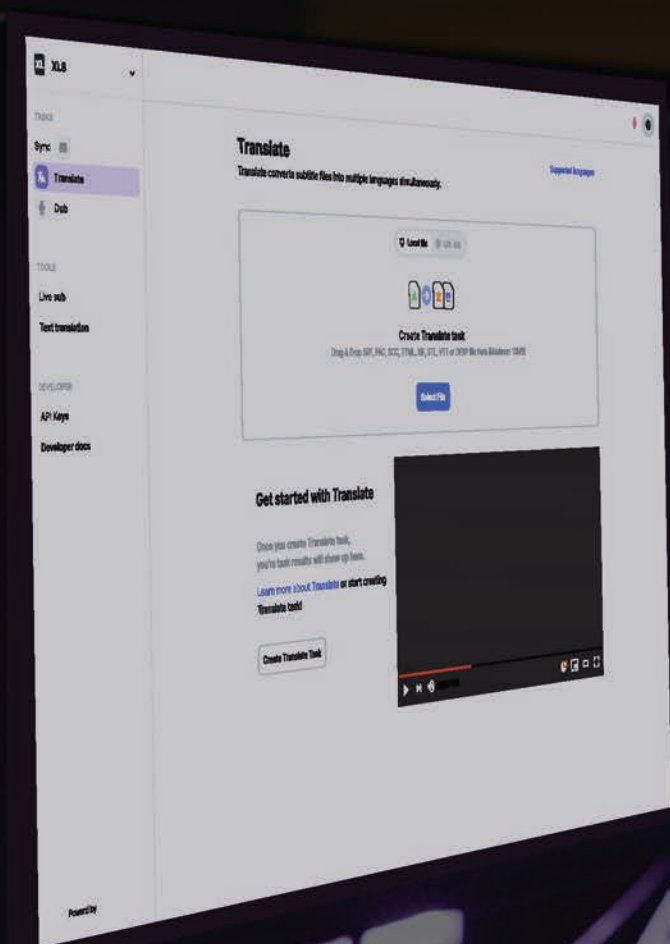
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Amazon Web Services .....	71 .....	aws.amazon.com	OTOY .....	57 .....	otoy.com
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Databricks .....	65 .....	databricks.com	RSG Media .....	47 .....	rsgmedia.com
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Digital Silence .....	59 .....	digitalsilence.com	Signiant .....	2 .....	signiant.com
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Metal Toad .....	17 .....	metaltoad.com	Zendesk .....	43 .....	zendesk.com



When cost, speed and scale  
matter as much as quality

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or just give Bente a call +44 (0)7483291034



content experiences. This can start with involving the most self-identified groups in accessibility and localization processes but should also go further. Include the deaf community in guiding the creation of closed captions and subtitles for the deaf and hard of hearing (SDH). Involve blind narrators and QCers in audio description. Seek feedback from monolingual viewers on dubbed and subtitled versions. Expand talent pools and pipelines to include marginalized and underrepresented groups. Build bridges and opportunities to foster talent in new places.

### IMPACT ON THE AUDIENCE OR VIEWER

In addition to adopting a more inclusive approach to the creation of AD, CCs, dubs, and subs, focusing on the experiences and reception of end viewers is also crucial. Various sources report that up to 80 percent of viewers who use closed captions or SDH are not deaf or people with hearing loss. But the primary audience — those who rely most on this mode of media accessibility — may have different needs and preferences than this majority of CC users. Looking to the deaf community for feedback and active input in the production of CCs can only help. Providing separate subtitles, without speaker identification and sound cues, for hearing viewers would be a natural choice to cater to these viewers. But this also poses a user experience challenge. How would the average hearing viewer know which menu option to choose?

### CHALLENGES IN EMBRACING INCLUSION AND DIVERSITY

There are several challenges and areas of disagreement in how best to improve inclusion and diversity in media accessibility and localization. Some see voice casting guidelines that rely on ethnic, racial, or gender identity as limiting and ultimately leading to tokenism. Regulations and laws enacted to protect personal data and integrity can prevent AD and dubbing producers from asking the very questions that could enable accurate and diverse representation in voice casts. Guidelines limiting voice casting options narrowly by gender identity, sexuality, ethnicity, or race can be divisive and lacking in consensus even among some underrepresented groups. Languages and cultures are constantly evolving, often with competing ideologies of individualism vs. universalism. Local economies and inequities can sway business decisions in ways that do not offer equal access or opportunity to creators or consumers, certain language variants are seen as inferior to others.

### PROGRESS OVER PERFECTION

Major industry players are working to navigate this challenging terrain and overcome these challenges. It's not just the right thing to do, it's also imperative to business success and subscriber growth. As an industry, we must not make perfection the enemy of progress. From the dawn of the motion picture and into the future, our industry, however imperfect, has always been fueled by embracing new voices and viewpoints, experimenting with innovative and unconventional approaches, and celebrating the unfamiliar. ■

strong discouragement of drug use. When consequences are less sensational, more like a bad trip than dying, the discouragement is considered implicit, and the age rating will be slightly higher.

Drug use without positive or negative consequences within the narrative is considered neutral, which is most often seen with softer drugs, e.g., marijuana, used as characterization. Because the story's focus is not on drug use and it functions more as a prop than a plot point, age ratings are lower than they would be if the drug were being actively normalized or glamorized. In *Knives Out*, for example, drug use is treated as incidental; there is a brief, comedic focus on smoking a joint to relieve anxiety — but it is not a significant plot point, and the scene is short. This is the drug use most seen in the 13-16 age range, with more sensitive countries suggesting higher age ratings and less sensitive countries, lower.

When drug use is shown throughout the narrative to be cool, desirable, useful, or helpful, content regulators consider it to be encouraged, glamorized, or normalized, and it results in a high age rating. Specifics of this vary by country but usually involve drug use by heroic or admirable characters, drugs used during fun party scenes without consequence, or drug use that is rewarded by the narrative. For overly sensitive countries, this can include documentary content, like cooking shows that feature marijuana or discussions about the benefits of MDMA treatment for PTSD.

Laws, rules, and methods related to content regulation and censorship vary significantly around the world. There is no one-size-fits-all approach to compliance for global distribution. Despite the complexity that often requires human judgment, the sheer volume of content produced and distributed daily necessitates the use of technology and automation. Humans alone cannot accurately and consistently apply thousands of rules to millions of titles on a recurring basis. As a result, Spherex has pioneered the use of state-of-the-art machine learning (ML) and artificial intelligence (AI) to meet the demands for global content compliance. ■

### VISTEX *Continued from page 90*

might bring to the service. The services will therefore need to pay some form of royalty payment based on ad revenue, subscriber numbers or some other measurable parameter.

### INCREASED OVERHEAD REQUIRES ROBUST ENTERPRISE SOLUTIONS

This additional royalty will increase the overheads of the services as the appropriate software will need to be in place to provide such calculations, as well as the skilled resources to manage the additional administration of the contracts and royalty payments.

In conclusion, living in interesting times is not always that much fun, as highlighted above. As the streaming services come to the realization that this is virtually a zero-sum game — one service's gain is another one's loss — and that consumer wallets can only be spread so far, it will still be interesting to keep an eye on developments in this space. I know that I will. ■

# Serving the Industry 2011 - 2022



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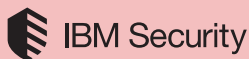
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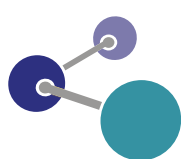
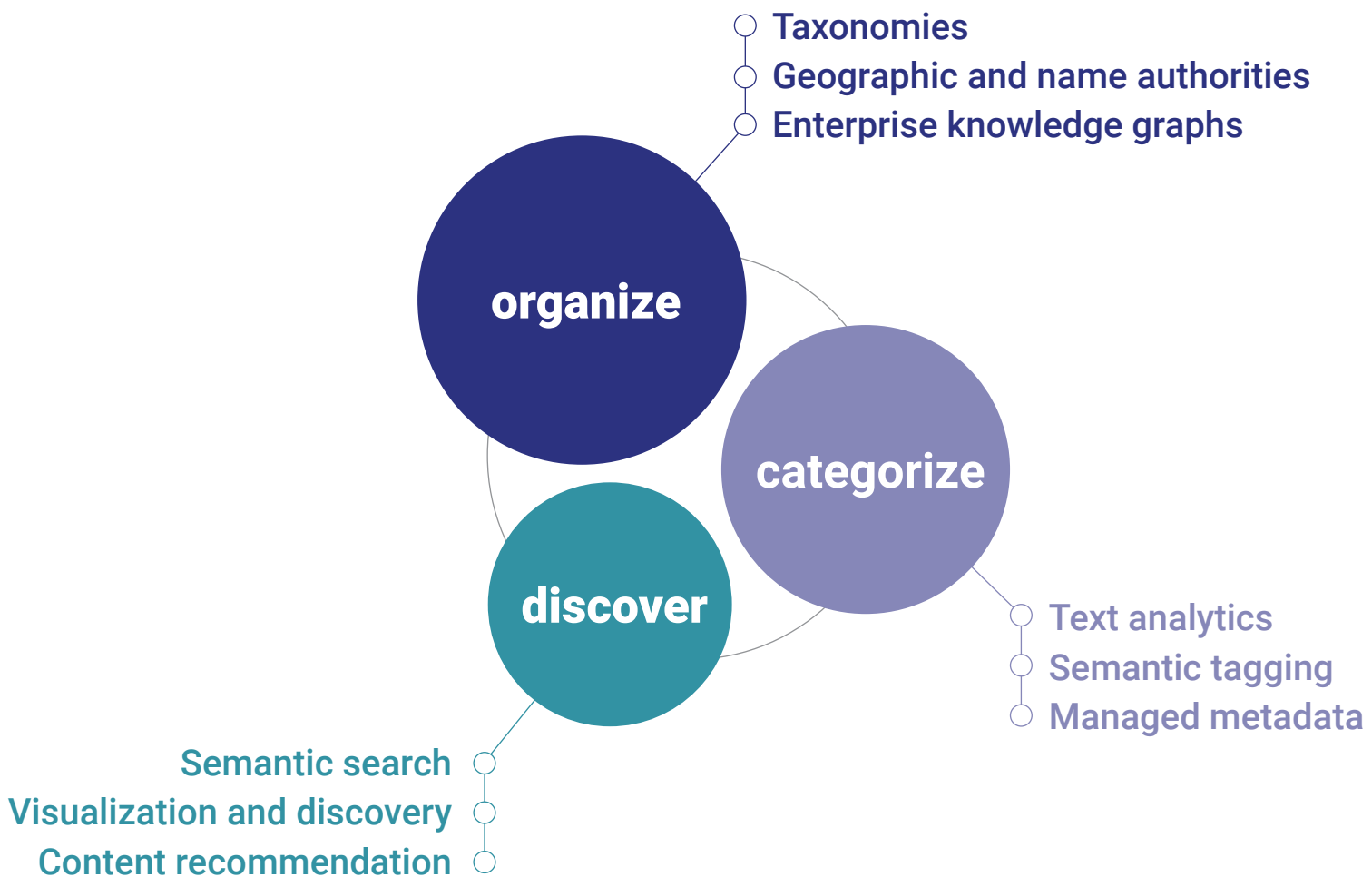
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# Enterprise taxonomies and metadata that drive content discovery



**synaptica**

increase in quality and customization of synthetic voices has made tasks such as audio description, which consists of a complex scripting but straightforward recording process, prime candidates for fully online workflows. “This is the reason behind our partnership with Veritone whose 100-plus synthetic voices are now available through the OOONA Integrated platform and already used in production by end clients,” Garb said.

At OOONA we make sure to listen to all our users’ needs. “We ran a contest earlier this year,” said Shlomi Harari, OOONA global account manager. “We wanted to collect ideas from our users on functionalities they think we need to focus on.” The results of the #OOONA2022 contest have included many of the features translator associations have been vocal about, such as concordance and termbase searches, predictive typing, and dictation support.

More automation is certainly on the roadmap for OOONA Tools, made possible by solid API connections to third party tools and software that can further facilitate the localization workflow. A selection of speech recognition and machine translation engines have already been integrated so OOONA’s clients have the option of selecting the right engine for each language they work in. A deeper integration of these tools is envisaged, with support for customized solutions and toggles for the use of metadata collected upstream to inform the system output. This will provide solutions tailored to the workflow, be it a subtitling or revoicing one. ■

the inserted ad. For example, understanding the program genre helps platforms align complementary ads, while metadata related to specific scenes allows for greater accuracy in ad-insertion.

The importance of metadata and its ability to differentiate video services is clear — particularly as bundling, aggregation and ad-based models evolve. A persistent issue is the quality of the metadata residing within platform content management systems. Most platforms enable ingest of metadata from a single source. However, there is no one source that provides the depth and breadth of metadata needed to support the analytics and algorithms needed for federated content discovery or dynamic ad insertion.

The answer is in the aggregation and enrichment of the metadata describing the content assets. By consolidating structured, semi-structured or unstructured metadata from multiple sources, content management systems become more valuable. Enriching existing metadata with complementary data that provides the who, what, when, where of a program makes content libraries more accessible and monetizable.

The evolution of TV is ongoing. The technologies enabling creation, distribution and consumption will continue to advance and challenge the status quo. However, without attention to the metadata describing the content we all crave, content owners and distributors cannot fulfill their true potential. ■

random numbers are only 32k, finding lucky random can be usually achieved within less than one minute. PAN and PXN are in place to prevent the kernel from accessing or executing user-mode memory.

### STACK CANARIES (IN THE KERNEL AND TAS)

Stack canaries protect against buffer overflow vulnerabilities. We found a textbook stack-based buffer overflows, in which we control the size of the copy and the buffer contents. In total, up to 1275 bytes can be copied, enough for storing shellcode. However, the TA uses stack canaries, therefore exploitation of this vulnerability is not trivial. Since we have arbitrary read and ASLR bypass, we can simply read the value of `__stack_chk_guard` and fill it in our shellcode so that the canary verification succeeds.

### PRIVILEGE ESCALATION AND ACCESS TO FULL TEE MEMORY

We take our investigation one step further to gain runtime control of the TEE kernel. Historically, exploit mitigations in TEE OSes have been lackluster compared to other modern OSes. However, for our attack success multiple vulnerabilities in TEE need to be exploited.

The kernel exposes a driver that can be used by privileged TAs to map physical memory into the TA memory space. We will leverage this driver from the hacked TA to map secure registers and unprotect the TEE memory. Finally, we use the same hacked

TA to modify the hypervisor page tables and allow Android apps to map the (now unprotected) TEE memory with complete read/write access.

We focused our attack on registers since they contain all the configurations of peripherals, including the ones used to secure the TrustZone. The two registers that are commonly used for configuring TrustZone are TZASC and TZPC. If a TA could access any of them, it would be possible to read the contents of such registers but also write to them, removing the protection of TEE memory. In principle, modifying any of the two could allow the REE to access the TEE, effectively compromising the security provided by the TEE. We decided to target the TZASC using our exploit and remove the protection of the TEE memory space. We managed to map all the TEE memory into an Android application, meaning that we can:

- *Modify the code of TAs and TEE kernel since the permissions restrictions do not apply to the Android application;*
- *Bypass countermeasures implemented in the kernel such as KASLR, PAN, and PXN;*
- *Gaining full TEE control and performing attacks like modifying the phone unlock functionality implemented in the TEE (fingerprint or face recognition) to bypass the screen lock. ■*

# SAVE THE DATE!

In-person, in London, 28 February 2023



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## **DETECT AND DISRUPT**

Our Credentials Sharing and Fraud Insights product (CSFEye) is a predictive analytics solution and a popular choice for service operators looking to identify credentials sharing activity and trigger and measure a response at scale. It does this without disrupting the viewing experience for honest users.

Combining behavioral analytics with cyber, network and human intelligence, CSFEye not only quantifies but also pinpoints the immediate threats resulting from sharing activity across your user base. It then helps operators deliver the right marketing and security response to the right users.

The response to casual sharers can often be a soft marketing response such as targeted promotions, higher concurrency limits, or discounted packages. In contrast, the response to fraudulent sharers would be to set device restrictions to limit or discontinue usage, or initiate password reset requests that force illicitly shared accounts to log out and reset their credentials.

## **TIME FOR ACTION**

When you're ready to start building your own plan of action, we are happy to share our experience to help you build a future-proof, anti-piracy strategy that has the maximum impact. Building on our 30-year heritage in security, our forensic-based, intelligence-led approach combines human insight with AI to deter, detect and disrupt piracy. ■

clear text usernames and passwords. Users should create a strong and unique passphrase for each online account and change those passphrases regularly. It is imperative that users set up multi-factor authentication on all accounts that allow it by using a reputable authenticator app (such as google authenticator) or text messaging. This is the best defense against password hacking.

When looking at emails, examine the email address in all correspondence and scrutinize website URLs before responding to a message or visiting a site. Most tooltips will show the URL or email message as a popup, without having to click on the link. Don't click on anything in unsolicited emails or text messages. Be cautious about the information you share on social media accounts. Sharing things like pet names, schools, and family members can give scammers the hints they need to guess your passwords or the answers to your account security questions. Regretfully, you did not win an overseas lottery. Never engage unknown people in conversations about forwarding money or any banking information to receive or send money. Don't send payments to unknown people or organizations that are seeking monetary support and urge immediate action, especially if it is from an unknown SMS number, claiming to be a boss or high-level employee in the company. When clicking on search results, check for the lock next to the URL, which means the site is secure. If the site is not secure, there will be a circle and slash around the lock.

And, as always: "If you see something, say something!" ■

the title, 3. Restricting playback by device-type or IP address. IP restriction is popular for being one of the more cost-effective ways of protecting content, but title owners must be aware of the risk of IP spoofing as a potential workaround to this level of security. Each of these restrictions allow content owners to control how users interact with a title, especially pre-release, and helps to deter viewers from sharing with additional users.

## **HTTPS VIDEO DELIVERY AND TRANSFER**

When it comes to data that needs to be kept private, HTTPS offers a level of web encryption that provides security by preventing tampering when the video file is in transit. While moving from file location to file location, encrypted data cannot be changed without destroying the data completely. It also offers authentication and peace of mind as data sent via HTTPS connections can verify their source location.

## **PASSWORD PROTECTION**

When sharing video internally or with external stakeholders, VIPs, or wider audiences, password protection still is a powerful and essential method for protecting content. As always, changing passwords every couple of months is recommended for additional security. Additionally, content owners can integrate with a SSO tool to help

ensure additional protection on content invitations.

## **DETECT AND DETER CONCURRENT STREAMS**

While credential sharing can lead to simultaneous logins from multiple locations, programs that allow content owners to see and investigate any unusual password activity can be key to cracking down on illegal sharing. Content owners can benefit from tools that allow them full transparency into users logging in from various IPs. If a user logs in two locations that are thousands of miles apart from each other in less than 1 minute, they can review and restrict that user from access.

## **STAYING AHEAD OF THE CURVE**

When it comes to the question of what's next for screener security, it will be necessary to consider the modes in which audiences will be engaging with content. AR, VR, and MR technology continues to become more mainstream for consumers and the metaverse's development is clipping along at an accelerated pace. According to BCG and Mordor Intelligence, the current market value for AR/VR/MR is around \$30.7 billion, and the market size worldwide of the AR/VR/MR market is to rise to \$300 billion by 2024. Content owners will likely want to select screening partners who are ready for and adapting to the changes ahead. ■

INTRODUCING...



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technology  
hollywood



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**MAKING A DIFFERENCE**

Lifting the aspirations  
and careers of one,  
raises all

**BELONGING**

Celebrating and respecting our  
differences while making space where  
we can unleash our unique genius

**CURIOSITY**

Exploring paths to fuel  
learning and growth

**LEADERSHIP**

Blazing new trails to  
confidence, courage, vision,  
and joy

**THE PILLARS OF WiTH**

Where WiTH members get into action:

- **Professional Development** — leverage our resources to broaden our collective expertise
- **Mentoring and Networking** — connect, inspire, and encourage each other while fostering growth in our professional network
- **Community Engagement** — be avid ambassadors of technology by encouraging youth to pursue careers in our field

**WiTH EVENTS**

The members of WiTH gather\* at these events:



- **WiTH Leadership Awards** — honoring contributors who serve as role models and mentors and who empower women to be bold leaders



- **SoCal Women's Leadership Summit** — designed to inform and inspire members around issues vital to the community



- **WiTH Workshops** — periodic educational and interactive events featuring keynote speakers and round table discussions with industry leaders

\*In-person and online



For more information, visit [withhollywood.org](http://withhollywood.org)

WiTH is a 501(c)3 charitable organization

higher costs, smaller audiences, and lower revenues.

## SOLUTIONS

Viewer consumption habits, distribution model changes and production advances have combined to drive the paradigmatic shift in entertainment.

However continuous improvement requires production companies to take a hard look at how and what they want to create based upon the new target demographics' preferences.

To create new types of entertainment products and entice the next generation of entertainment viewing consumers, production companies must improve ideation, creative development, incorporate virtual production techniques and expand their business models to include interactive extended reality storytelling.

Visualization of creative ideas is already a given. More realistic visualization, through spatialized, simulated, extended reality (XR) can significantly improve the creative development of productions and provide ongoing roadmaps to new storylines that emerge through better interactive ideation.

## XR AS A TOOL FOR BETTER PRODUCTIONS

Utilizing XR technologies to enable a true spatialized form for visualization, (e.g., user interface or UI). Along with interoperable asset management technologies, XR will benefit production creatives to communicate ideas, concepts and changes to their collaborative teams more efficiently, thereby improving production development.

Through simulations that presents data and information in a more realistic manner — drives better perception amongst creatives: specifically spatialized visualization. Specialized visualization is a more natural — intuitive way to engage with collaborative teams.

Specialized visual representation works to enhance, and trigger improve the cognitive processes of perception, creativity, memory, attention, problem-solving, and learning for anyone involved in the

creative aspects of storytelling.

For forward-thinking leaders in the entertainment the next way we do entertainment production will be through reality simulations, XR special visualization, asset manipulation and management.

For the industry, a new, form of asset management with an extended interoperable framework can help usher Production companies, and other entertainment entities into the immersive space with an easy-to-create visually intuitive solution — that works to drive repeatable interoperable interaction for creative to produce better quality productions.

Production advances and viewer consumption patterns have driven the paradigmatic shift in Entertainment. These Industry “hot buttons” are also the keys to the future success of the entertainment industry.

Perception Grid is building a flexible, new, interoperable creative management system to help production companies create, and interact with their collaborative teams, source assets, as well as engage to test in new and better ways.

Perception Grid's objective is to simplify and improve the process of producing, manufacturing, and assembling media content for entertainment production by accelerating perception through improved interoperability, content organization, visualization, and agile process.

**noun: perception; plural noun: perceptions**

- the ability to see, hear, or become aware of something through the senses. “the normal limits to human perception”
- state of being or process of becoming aware of something through the senses. “the perception of pain” cognizance, awareness, consciousness, knowledge, acknowledgment, grasp, understanding, comprehension, interpretation, apprehension, impression, sense, sensation, feeling, observation, picture, notion, thought, belief, conception, idea, judgment, estimation. 田

## MEDCA *Continued from page 11*

to implement data industry standards and practices in designing, constructing, securing, and maintaining the foundational layer of their data driven operations supports a better client use experience for any given data-centric equipment and application solution. Encouraging proper facility digital infrastructure in the M&E space advocates for a better customer experience with digital applications or data equipment, supporting performance, reliability, security, and sustainability.

## MEDCA: BUILD IT AND THEY WILL COME. BUILD IT RIGHT AND THEY'LL STAY

Digital infrastructure is the foundation of all data transport. Bringing data center infrastructure standards awareness to the M&E industry is MEDCA's mission. Understanding firstly size, that data centers are not only the hyper-scale (cloud) centers seen at AWS, Azure, or Google. Data centers come in all shapes and sizes; inhabiting pre-production, production and postproduction service operations; from production offices, stages, DIT carts, cameras and light-

ing, to broadcast booths, virtual production equipment, on-prem servers, and more. Without a baseline understanding of the digital world's existing infrastructure standards and practices, reliable transport of data can suffer and/or can fail completely, in any data driven application. Secondly, support, data center infrastructure is the foundational layer upon which all data-centric workflows rest. A poorly formed infrastructure ensures poor performance.

Data center infrastructure design, construction, and maintenance standards are set by the data industry. Implementation of such data center infrastructure standards and practices provide M&E facilities and service providers technical alignment and performance, interoperability, risk mitigation, and customer service. Lastly, nothing new, the standards and practices that support proper data center infrastructure already exist and are governed within the data industry. Bandwidth demands of M&E technologies are increasing exponentially. Only digital infrastructure built to data industry standards can support digital workflows to their full potential, be it the technologies of today, or of tomorrow. 田



there for each other. The bonds that are built between colleagues and peers drive the collective energy behind any industry. It's a common bond that we're all doing our part in a global machine that satisfies a consumer or a customer. And "we" are the people who inform and entertain the world! Media & Entertainment has a certain glitz and gloss that brings our comparatively tiny industry the international spotlight. So, our community is influential and, back in the physical days, entirely unique. No one, literally no one, could produce content like Hollywood.

At the dawn of the new era of ones and zeroes Hollywood is no longer unique. We look to other industries to accelerate our transformation. MESA's made a point of this since our first Entertainment Supply Chain Academy (ESCA) events in 2005. How we build and operate technology stacks of cloud-based SaaS solutions inside our data centers isn't what we're about. We're about providing a vessel to creatives, whether in the production or distribution process, that allow them to build their art, do their thing, and contribute to

the company's bottom line. Where, when, and how we do that is constantly being reimaged and rebuilt so we can further the limits on our creative possibilities ... that's where innovation and transformation shines.

But if we've learned anything over the past 24 months, it's that we can't (and won't) stop. We need to use our community platform to be unrelenting in our approach to collaboration. The transformation of our industry began over a decade ago and our communities have fostered visionary ideas that have become standard practice around the world in every part of the supply chain. By shining the light on our global needs in accessible, localized content we are shining the light on one segment that has come together organically and grown together to where we are today. MESA will continue to produce events and media that nourishes your soul but know that this content, this magazine, the newsletter, the events, the vision ... it comes from the community and you're a big part of it. ■

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**BAINES** *Continued from page 8*

more directors and voice talent in the dubbing industry, and they cited the importance of building more of a community to help with this. Some of the concern felt amongst the freelance community was also shared, with the growing use of AI and automation seen as a potential threat. It is clear, however, that from a localization perspective, automation and integration is a major focus to enable greater efficiencies and to allow the talent to focus on the creative aspect of their role.

This need to drive efficiencies is the major reason behind the Cloud Localisation Blueprint (CLB). This project, which formed out of the IBC Accelerator program, brought together collaborators from across the industry who spent 13 weeks devising a proof of concept which is built on an AWS backbone.

The localization supply chain is often described as "spaghetti-like" and lacking visibility and, with the vast number of vendors, studios and service providers involved, it is perfect for innovation, transformation, and disruption. Since the initial discussion at IBC, MESA has spoken about the CLB at two events, Languages & The Media in Berlin and at the British Hollywood Innovation & Transformation Summit (BHITS) in London.

MESA has long been a supporter of Languages & The Media and is an association partner. We were thrilled to be back in person in Berlin after a four-year absence due to the pandemic. There was a real buzz at the event and a strong feeling of community which was great to be a part of. The freelance community were there in force along with academia, language service providers and several major content owners. There were many standout sessions around diversity, accessibility, freelancer conditions and AI and machine learning.

The MESA panel comprised experts from across the industry (Fabric, Iyuno, LinQ, SDVI and Sony Pictures). We spoke at length about the challenges the industry is seeing and the extreme pressure everyone in the supply chain is facing right now. One key piece of advice was to talk more about the issues and to continue to elevate the critical role that localization plays. Maybe this way

we can help encourage more people into the industry who are currently in other roles and have never even considered localization as a career option.

The requirement to find any time savings led us to discuss the CLB and the four key aspects that the Blueprint is designed to help solve: capacity, infrastructure, visibility and standards. Capacity to deal with the huge volumes of content in multiple languages and versions and to help plan ahead more effectively; infrastructure to create scalable, interoperable systems that work together, and which replace old and outdated legacy systems; visibility to provide accurate, real-time data on a unified system; and standards the absence of a unified identifier standard is a clear obstacle which is where the Entertainment ID Registry (EIDR) and Language Metadata Table (LMT) come into play.

The conversation around the CLB continued at BHITS, led by Hollie Choi, managing director of EIDR. Choi told the audience: "For me, the Cloud Localisation Blueprint project was a modern approach to a localization workflow that automates the process and allows visibility into the process all the way through". The panel session "The Cloud Localisation Blueprint (and Why Does it Matter)" talked in depth about why the blueprint was needed and how more companies can get involved. While the key purpose of the CLB is automation and efficiencies, McBride from Iyuno made the point that "80 percent of what we do is still basically human beings in a studio acting and translating and performing work" and until artificial intelligence takes on a more significant role, "we still have to schedule those human beings to be in that room at a certain time to perform that role and deliver materials back."

The human element of localization is of paramount importance and while tools are vital in aiding the process and enabling efficiencies, we must not forget the need for creativity. We will see continued evolution in software, AI and machine learning as progress never stops, and change is the one constant in localization. ■

## **GEOCOMPLY** *Continued from page 51*

detecting VPN activity, such as regularly reviewing the VPN market for vendors claiming to avoid detection by using your service. Internet searches for “Top VPNs for Streaming” or “Best VPN for Your Service” will give insight into those vendors targeting you.

Respond. By increasing the blocking rates on your service with a reputable VPN and proxy detection solution. If you do block a connection, provide the users with clear messaging and a way to report issues — mistakes do happen.

Educate. Teach consumers the risks associated with hijacked residential IPs. Most consumers will not even be aware of unwanted VPN or proxy traffic being routed through their home IP address.

We help rights owners around the world protect against VPN abuse. As part of this, we have investigated the digital risks of so-called “free” VPNs to consumers. The demand for these free services has been rising and therefore the pool of available residential IP addresses for sale will also grow.

We can — and should — apply the best technical strategies to thwarting geo-piracy threats. However, it’s an obvious plus if we can get a customer to think about the personal privacy and security risks associated with using a free VPN. After all, one less customer who uses a “free” VPN is one less residential IP address for sale. And that’s a big win for us all. ■

## **VSI** *Continued from page 27*

race, ethnicity, disability, sexuality, and gender identity are better reflected. We’ve been here from the start, not only pioneering English dubbing from our studio facilities in Los Angeles and London but leading the way in multilingual localization from our global studios. We know that the audience experience is key and for more than 30 years, we have developed a strong talent pool, be it voice artists, directors, adapters, translators, graphic artists, transcreators and more, so that we can quickly move with the changes in the market but also ensure we deliver the highest-quality localized versions for our clients and their global audiences.

We are living in exciting times. It seems that the English-speaking audience for local language content will continue to grow as the publicity around the high-profile releases snowballs and more and more viewers are exposed to a plethora of ideas and stories from across the globe. Other territories have embraced content that is not originally made in English as long as it is well localized. It is likely there will be a knock-on effect in the wider industry, with more subtitlers and dubbing professionals localizing into English. One thing is for sure, this phenomenon acts as proof of that oft-repeated adage: the main thing the audience cares about is the story. For today’s audiences, it is paramount that their experience of that story is authentic, something that is only possible through top-quality localization. ■

## **ATKINSON** *Continued from page 14*

be attributed properly, and not attributed to a marketing campaign or other activity.

The example I gave was specific to geos/markets, but this approach to linking your efforts to those most valuable to the business also include channels, products, or other aspects. You will not have to make these up, just go see your CFO and tell them that you want to link your activities to the areas of the business that are most valuable and

therefore you can actually contribute the most (note: I expect that you will have to educate them on this approach as it is totally logical but counterintuitive since they tend to think that your efforts should be focused on high-piracy but low value markets).

So, get focused. Even if you just focus on one top market to “prove you can make a real difference,” I am confident from my own experience and others I see doing this, that it works. ■

**M&EDCA**  
MEDIA & ENTERTAINMENT  
DATA CENTER ALLIANCE

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310-968-8061

**Bringing Data Industry  
Standards to the Land of  
Make Believe**

[www.MEDCAonline.org](http://www.MEDCAonline.org)

The first hurdle most data storytellers face is gaining acceptance for the validity of the data they present. The goal of the storyteller is to clear up all questions as to the source of the data, the age of the data, so that in subsequent views of the data, the storyteller isn't continually defending the data.

The hurdle is ensuring that the data storytelling consists of visualization, narrative, and context. With visualization, a picture is worth a thousand words. The visual component of data helps people who do not understand technical data maps see it in a more simplistic way. Data scientists are not that great about helping end users visualize what the data is about. Therefore, to assist with complex visualization methods, it is important to add a narrative and context to the data being presented. The narrative is the story itself — the who, what, where and why. It's the emotional arc. The context is what the people hearing this story need to know.

Overall, data storytelling is about "action," helping people create those narratives, providing more of the context, and allowing people to see the clear line between the data, the insight, and the action to come. In this story, what the data storyteller hopes to reveal will help bring insights and hopefully "action" to those producing or transforming content that is relevant to the respective local market. And there are many local markets on this planet.

The internet has blurred geographical boundaries, access to products, information, services, and content has become universal. The globalization of markets has created both opportunities and challenges. There has never been a better time to share content with foreign markets. However, the task of making your content relevant, unique, and tailored to local markets has become more complex than ever. Content consumers expectations are higher than ever, and they demand a seamless and personalized experience — no matter where they are in the world.

Data-driven insights for localization is a must-have. As data enables stakeholders to define priorities based on real-life and real-time (true) usage it must put and keep localization processes on the right tracking mode. If so, localization effectiveness generates a circular flow of data as it is driven by what customers do and like as much as it helps the whole business grow (with a laser focus on features and content that make a difference in a geographically diverse environment). Data storytellers translate all this data into information which, if acted upon, can magically create content to match a specific consumer.

Content creators need good storytellers. To be exceptional content creators, organizations need exceptional data storytellers to reveal the true action behind what is and what can be. ■

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## **SYNAPTICA** *Continued from page 109*

in English (en) and supported language characters, such as Arabic (ar) and Bulgarian (bg).

An organization may create a taxonomy (or multiple taxonomies used together) in a base language such as English and then invite taxonomy editors to add labels in other languages. Each English language concept is mapped to one or more concept labels in other languages and the taxonomy can be displayed to content creators in a language of their choice.

### **TAXONOMIES WITHOUT BORDERS**

Taxonomy management systems usually include the option for on-premise or cloud deployments. In today's remote work world with teams which may be situated in centralized and home offices across the globe, access to cloud-based content management systems is becoming the norm.

Applications used for content creation, management, and retrieval can easily pull multi-lingual taxonomy values from a taxonomy management system, allowing users to use consistent terminology values within the body of text or as typeahead values for metadata tagging. Because these values are consistent, content is then easier to gather by topic, author, or any other applied metadata value.

Behind the scenes, the mapping between language values also allows content creators to search for content tagged across languages. That way, a search for a subject in one language can bring back content tagged with the same subject in many languages. Grouping content in this way can reduce the amount of content recreation when appropriate content can't be found (even though it probably already exists) and facilitates content discovery across languages which the searcher may or may not speak.

### **SINGLE TAXONOMY BENEFITS**

The overhead of a good deal of translation work is shifted to a single point in the content creation stream in the single source of truth taxonomy. To be clear, taxonomies won't include every possible sentence in every language to be used in marketing content. What they can include are the main marketing terms and phrases determined to be important by the business. Since these concepts change over time, they can be added, updated, or deleted quickly in a single location and made available for use globally across users, systems, and countries.

Using one or a few taxonomies supporting multi-lingual labels for content authoring and tagging reduces the complexity of developing many taxonomies in a single language for use in each regionalized content-producing location. Mapping separate taxonomies every time content is created (or not at all) creates a fragmented and chaotic information landscape in which it is difficult to find content and leads to time spent recreating content which already exists.

Mapping separate taxonomies in different languages once is time-consuming but can then be used with fewer changes over time. Creating a single taxonomy from existing vocabularies in one or more languages and using multi-lingual labels may require up-front effort, but the creation, maintenance, and governance reduces greatly over time.

The delivery of multi-lingual, localized marketing content supported by a single source of truth taxonomy on the back end streamlines the content creation and management process for better delivery to end users. ■



Rightsline publishes a notification in AWS Event Bridge. The Fabric system recognizes the notification and automatically adds the title, looks it up in EIDR, then pulls in the EIDR ID. A user in Fabric places the order for localization and publishes an event in AWS Event Bridge, which is seen by Iyuno, Codemill, Vidispine, and SDVI. This is a very short list; it could be seen by any number of vendors and partners who would then kick off work orders and/or automated processes to complete the order. As each of the vendors and systems finish a step, it is registered to the AWS Event Bridge, and other automated processes are started. New EIDR IDs are requested by Fabric as new edits are generated, and our studio executive sips their coffee (or tea depending on where they are in the world and their personal preferences) while viewing the dashboard in AWS. They know exactly what work has been done and what is still outstanding the entire time. It's like a supercharged flash mob, except the dancers and choreographers are professionals, the best in the business.

If you'd like to know more about the Cloud Localisation Blueprint, or you want to develop one of your own, the plans are available at [cloudlocalizationblueprint.com](http://cloudlocalizationblueprint.com) or [cloudlocalisationblueprint.com](http://cloudlocalisationblueprint.com) — depending if you speak American English or if you speak The Queen's English/BBC English. Is it still the Queen's English or is it the King's English? May she rest in peace either way. ■

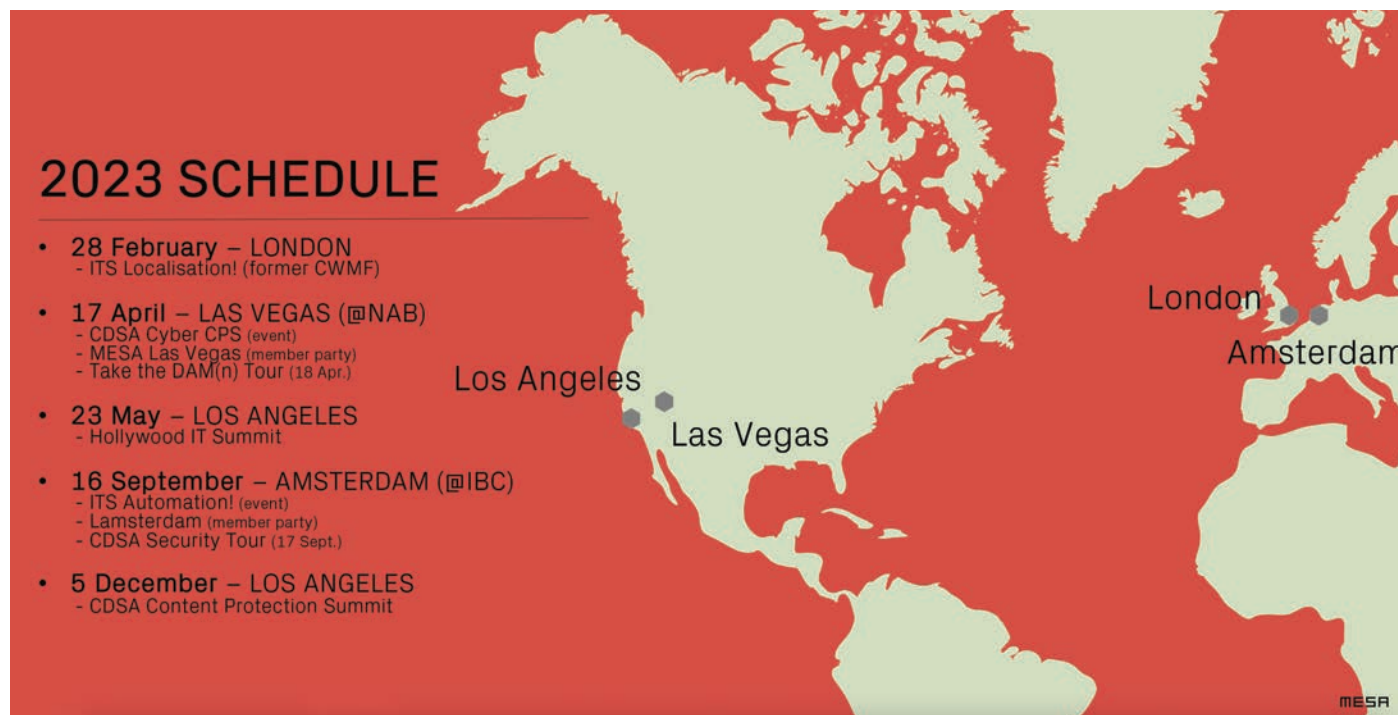
level that opens a new world of opportunities. Auto-narration by an artificial voice is a service that publishers already use in some cases, which recently caused a stir in the audiobook arena. One of the strongest arguments in favor of auto-narration is the possibility it offers to convert into audio a great list of titles that would otherwise have never been voiced. Earlier this year, a Chinese video game producer replaced the voice of a popular game character with a synthetic version of his voice when the actor was no longer available to go to the recording studio.

Any content owner could have their own bespoke voice created, for use in their content with no issues over ownership and IP rights or risk of a contractual period ending. Synthetic voices have the potential to become famous brand voices. What it takes, for now at least, to make them indistinguishable in context to human voices is a 'proof listener' who will fine-tune the output of the machine, its pace, pitch, intonation, emotion, etc. via an interface that facilitates such synthetic speech editing, until the machine performance is sculpted to perfection.

Similarly to how audio experts create sound effects, could the ability to give birth to performances out of synthetic speech "actors" result in "synthetic speech director" being one of the new jobs that will emerge in a brave new era of storytelling? ■

# MESA

# UPCOMING EVENTS



## 2023 SCHEDULE

- **28 February – LONDON**  
- ITS Localisation! (former CWMF)
- **17 April – LAS VEGAS (@NAB)**  
- CDSA Cyber CPS (event)  
- MESA Las Vegas (member party)  
- Take the DAM(n) Tour (18 Apr.)
- **23 May – LOS ANGELES**  
- Hollywood IT Summit
- **16 September – AMSTERDAM (@IBC)**  
- ITS Automation! (event)  
- Amsterdam (member party)  
- CDSA Security Tour (17 Sept.)
- **5 December – LOS ANGELES**  
- CDSA Content Protection Summit

MESA



# TIMING IS EVERYTHING WHEN IT COMES TO CONTENT PROTECTION



Why do we love sports? Because live action is unpredictable and immediate. These same qualities make protecting live sports difficult. The key is to do something to stop piracy during the live action; otherwise, all the value is gone.

NAGRA Active Streaming Protection is a solution framework designed to meet streaming piracy head on.

Get end-to-end protection today across devices, applications, service platforms, and content delivery networks.

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## Streamline. Simplify. Scale.

Our SaaS platform combines automation and insights allowing entertainment companies to reduce costs and improve content monetization for today's increasingly complex challenges



LICENSING  
CONTENT PLANNING  
FINANCIAL OPERATIONS  
CONTENT & AUDIENCE INSIGHTS

**Content Value Management™**

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