

# How a successful system integration can elevate your OTT service



The spectrum of options in the digital entertainment space is widening, and on-demand and live consumption of content is reaching an all-time high. System integration in the complex and often difficult-to-navigate OTT and streaming sector is a key differentiator, integral to a successful service.

In this technical paper, we analyze the key aspects of the partnership between Simplestream and Unified Streaming. We examine how the integration of Unified Streaming's core products and solutions—namely Unified Remix, Unified Origin - VOD, Unified Origin - Live, Unified Capture, and Manifest Edit—enrich Simplestream's offering for out-of-the-box streaming and OTT solutions, serving a wide range of customers among broadcasters, content owners, children-focused channels, and operators in the news space.

**The document aims to provide a thorough overview on the portfolio of Unified Streaming, with a focus on how the company's products integrate with Simplestream's Media Manager, powering a number of aspects of the overall solution.**

## ▶ This white paper answers the following questions:

Why is it key for customers to choose a service provider that's able to integrate third-party products seamlessly, with the objective of creating an easy-to-use and highly effective multi-platform experience?

How does the integration of Unified Streaming's suite of products work within the Simplestream tech stack?

What does the future of integrated solutions look like for customers surfacing the OTT sector or existing operators wanting to deepen their owned and operated services?

Finally, the document provides an overview on real use cases from Simplestream's client portfolio, all gaining advantages from the integration with Unified Streaming's core products and solutions, with emphasis on GB News, BFBS, Digital Theatre, and Narrative's POP brand.

# Tech stacks: an overview

## Simplestream

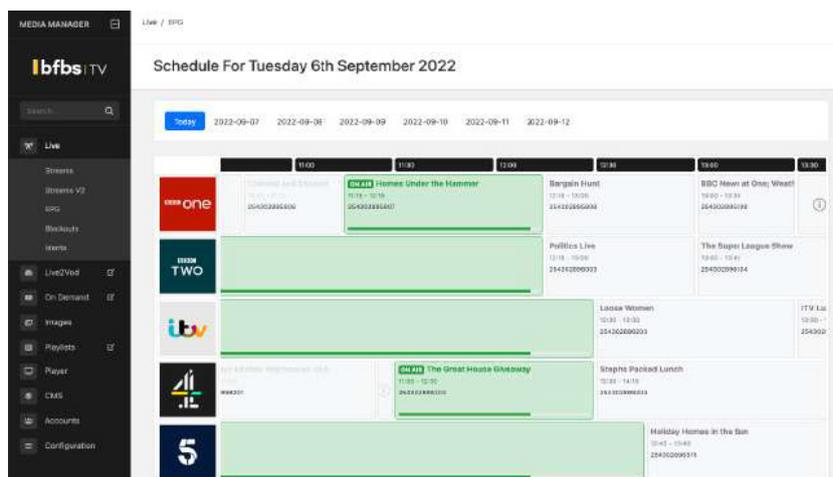
Simplestream is a best-in-class provider of next-generation TV solutions, covering a broad spectrum of sectors such as broadcasters, content owners, sports entities, teleshopping, kids channels, news channels, and other media brands. Listed below are Simplestream's solutions that support industry-standard playout formats across the most popular devices and platforms.

architecture, from a single source of truth. It supports the ingesting, encoding, packaging, storing, protecting, and streaming of both live and on-demand multimedia content. Enriched with data analytics, monetization, and user management modules, Media Manager integrates with a variety of third-party solutions to create the most effective environment for end-to-end content management.

## Media Manager

Media Manager, Simplestream's modular backend, manages content for distribution. As a cloud-based Online Video Platform (OVP), with integrated Content Management System (CMS), Media Manager lets users manage every single aspect of scalable OTT and streaming

Besides the core modules, a wide range of other services (complementary to Media Manager and its modular yet robust architecture) is available. Media Manager is the one-stop-shop of choice for customers wanting to strengthen their content offering across multiple touch points through an easy-to-navigate, cloud-based platform.



## App Platform

App Platform is the out-of-the-box product designed to streamline the launch of premium video services, already in use with over 30 customers across the globe. Built on a powerful framework controlled via Media Manager, App Platform lets operators create feature-rich applications effortlessly, according to three key principles: reduced time-to-market, scalability, and enhanced monetization opportunities. It supports 13 platforms and operating systems, namely iOS; tvOS; Android; Android TV; Fire TV; Roku; LG TV; Samsung TV Plus; Playstation; and HbbTV platforms for big screens such as FreeView, Youview, Freesat, and Virgin Media.

## Fast Channels

FAST Channels enable you to leverage your existing backlog of video-on-demand (VOD) assets, repurposing it into 'live' linear channels that can grow revenue streams through targeted advertising. With VOD2Live service at its core, and Server-Side Ad Insertion (SSAI) as an option, the solution delivers a seamless playback experience. FAST Channels as a product lets you ingest content via multiple sources (S3/FTP, MRSS/RSS, or direct upload), leveraging remote locations for content, stored externally.

Ad-server agnostic, the advertising opportunities can be explored via pre- and mid-rolls, VAST or VMAP tags.



**Unified Streaming** is a video delivery technology company with best-in-class software and industry-advancing standards and specifications, and counts over 150 names among broadcasters, telcos, streaming platforms, content creators, and partners globally.

The thorough value proposition includes three products that are key to enhancing the video content delivery workflow and provide OTT operators with a stronger and more flexible infrastructure to deploy their services across multiple platforms. Listed below, Unified

Streaming's core solutions support all industry-standard playout formats, codecs, on-the-fly encryption, and all the major DRM systems (Adobe Access, FairPlay, Marlin, PlayReady, and Widevine) with multiple keys and key rotation.



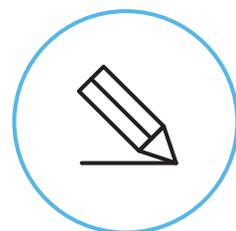
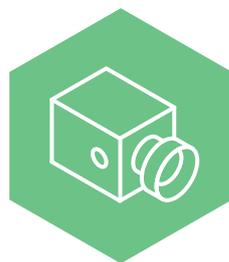
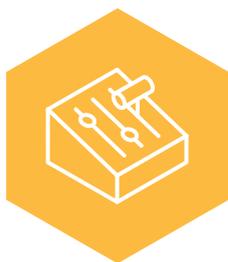
**Unified Remix** takes an innovative approach by “mixing” clips from one or various sources into a single stream. Use cases include virtual live streams, stream personalisation, pre-rolls, mid-rolls, post-rolls, and Network Personal Video Recorder (nPVR). Think of Unified Remix as a just-in-time video editing suite. Streams can be personalized in any arrangement: a stream for each viewer, streams to groups of viewers (for example, according to geolocation or subscriptions), or even a single stream for all viewers.

**Unified Origin - VOD** enables users to stream from a single source. They can package and secure a single VOD presentation just-in-time (JIT) into formats that reach any internet-connected device. A future-proof, highly resilient solution that scales to demand, Unified Origin - VOD meets the infinitely evolving needs of media companies looking to offer the most advanced, highest quality, personalized service.

**Unified Origin - Live** lets users package and secure live video just-in-time into all formats. Unified Origin - Live also offers users the possibility to live-stream flexibly with restart and catch-up functionality, and deliver 24/7 live linear channels, events, concerts, sports events, or breaking news. As with any Unified Streaming product, Unified Origin - Live offers the capability to deploy anywhere: bare metal, on-premise, containerized, or in the cloud.

**Unified Capture** allows users to capture video from a stream in a frame-accurate way. Capture is great for Live2VOD workflows, since clips are created from the same live linear channel available to viewers, and all bitrates are captured. This way, no separate processing or encoders are required. Capture is also used to enhance streaming services with catch-up, nPVR, and restart TV.

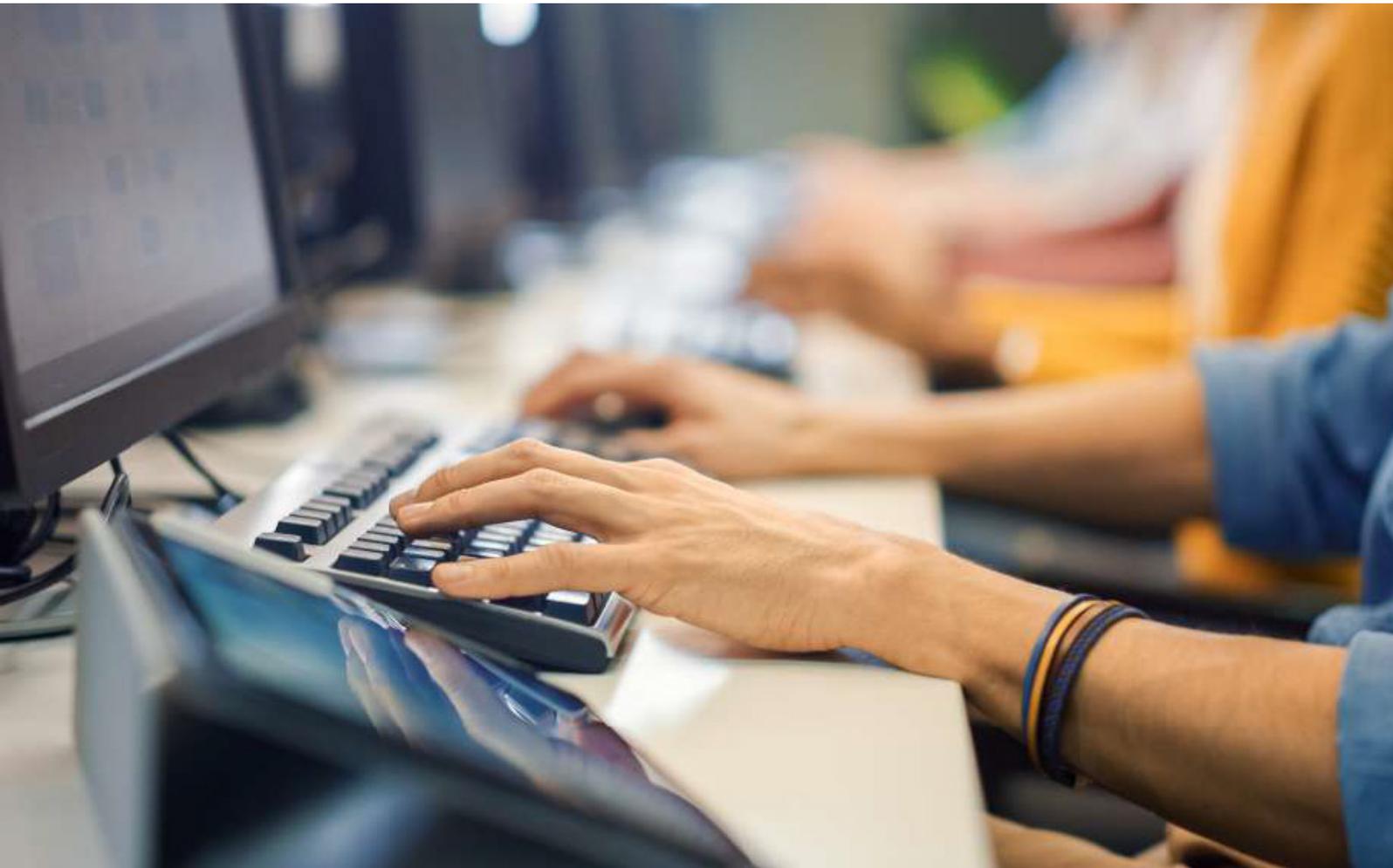
Finally, **Manifest Edit** is a tool for users who experience difficulties using a single manifest to meet the needs of every device. Closely tied to Unified Origin and Unified Packager, the feature boosts device control and compatibility, making it possible to serve even more viewers with personalized streams.



## How does the integration work?

Simplestream works closely with Unified Streaming to ensure that all the video workflows involved in content playout include Unified products, where appropriate. This may be sending live streams from an encoder to Unified Origin - Live, or configuring Unified Capture to retain the manifest from an existing Origin. In all cases, Unified is included as part of the video workflow from the beginning of design and architecture.

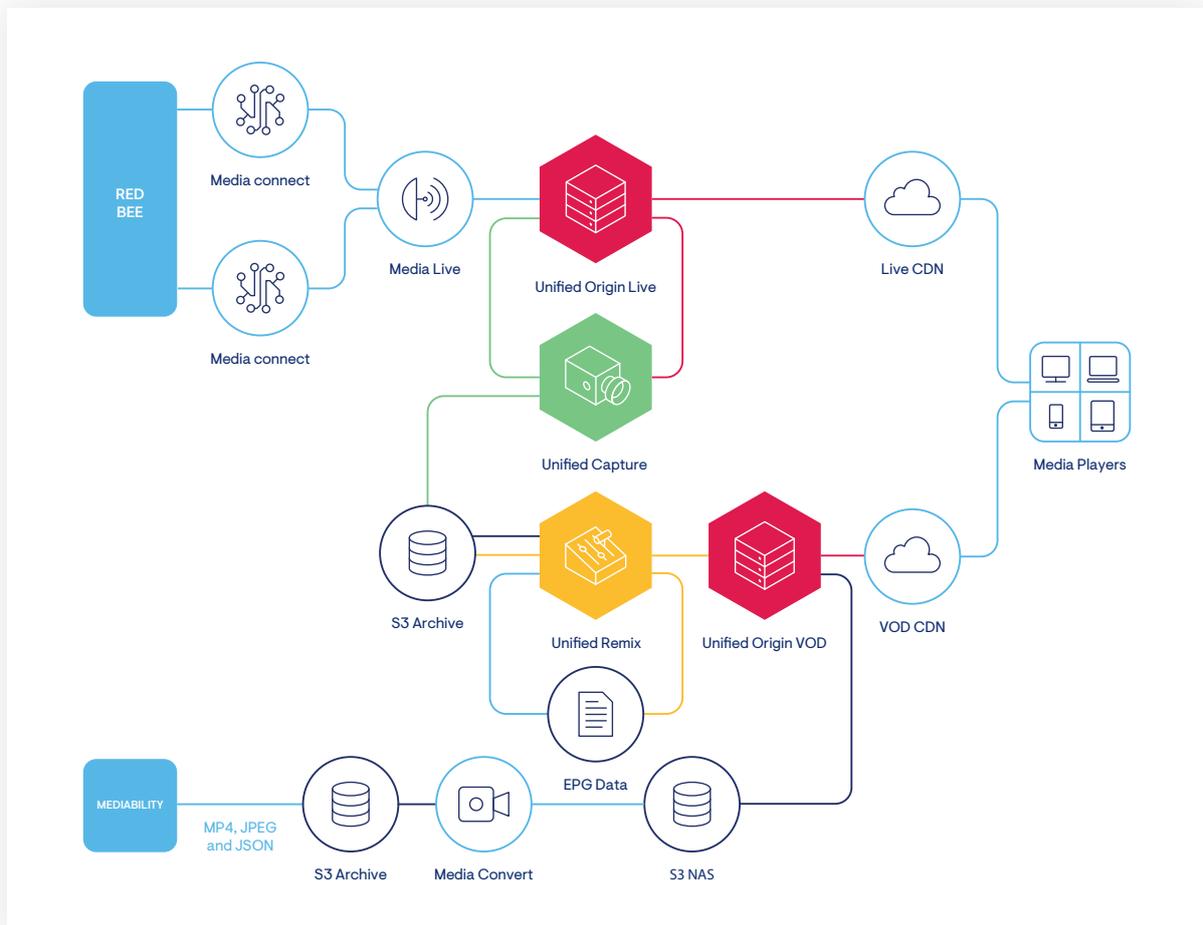
Integrations play a key role in the value that technology partners can provide to their clients. Combining Unified Streaming's solutions with the Simplestream tech stack provides several areas in which redundancy is achieved through these integrations, providing peace of mind for Simplestream's customers.



## Use cases: GB News

GB News, the British free-to-air television news channel, chose Simplestream to develop and deploy a full set of over-the-top (OTT) services—across multiple platforms—by leveraging proprietary products such as App Platform and Media Manager as a content management system and orchestration layer.

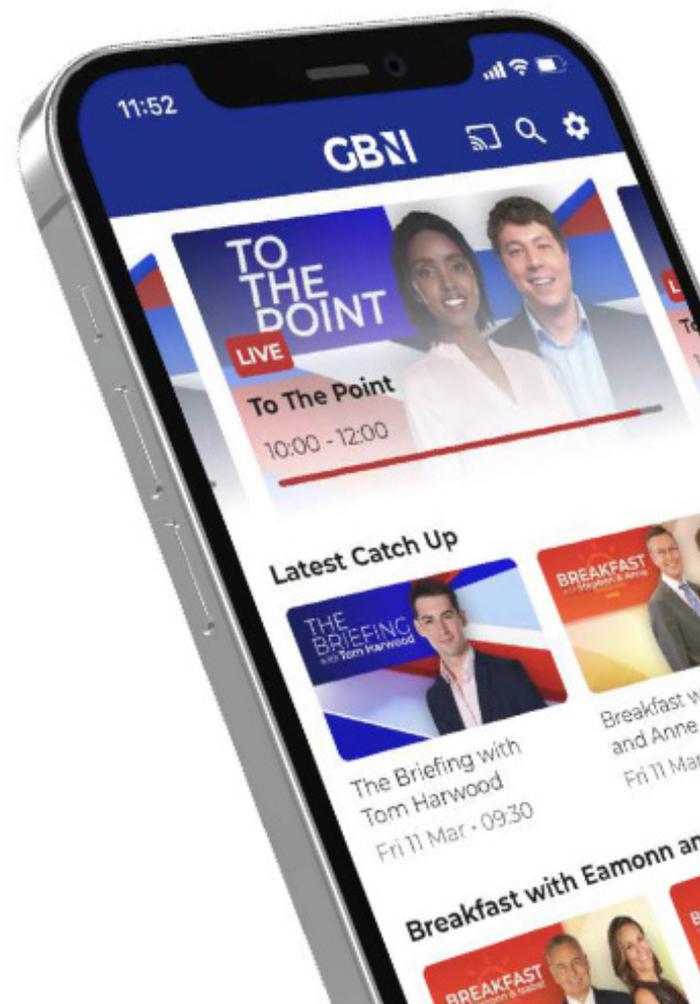
The integration with Unified Streaming’s Unified Remix, Unified Capture, Unified Origin - VOD, and Unified Origin - Live was crucial to the success of this project. GB News is built on two different workflows, one of which allows Simplestream to ingest the live stream via Amazon Web Services (AWS). The other workflow supports the video-on-demand (VOD) assets, which are deposited into a Simplestream storage location by third-party Mediability.



**Unified Origin - Live** is used to process the live stream received through AWS, packaging the multi-bitrate renditions into HLS and DASH files, which ensure playback is possible from any device. Simultaneously, **Unified Capture** is set up on a different server, but is also connected to Unified Origin - Live and requests the manifest of the live stream being processed. This includes five-minute segments of the stream being processed, which Unified Capture then stores as individual MP4 files in a dedicated location. The requests take place every five minutes so that the live stream is captured in continuous sequential five-minute segments over the 24 hours that the live stream is running. Additionally, SCTE markers are used to identify the start, end, and break times of each asset within the captured live stream, which Simplestream uses to create a SMIL playlist, which concatenates the markers and provides a simple running order for a single program captured from the live stream. The SMIL playlist is used as an input to **Unified Remix**, which then creates a reference MP4 to recall all the five-minute segments that the program was captured as, with Unified Origin - Live, into a single, continuous MP4 asset. The SMIL playlists also include ad breaks by removing parts of the segments when formed into a reference file.

Finally, **Unified Origin - VOD** serves both the content processed by Unified Remix as well as the content from Mediability. The assets are processed and packaged into HLS and DASH files for playout on all devices on the fly.

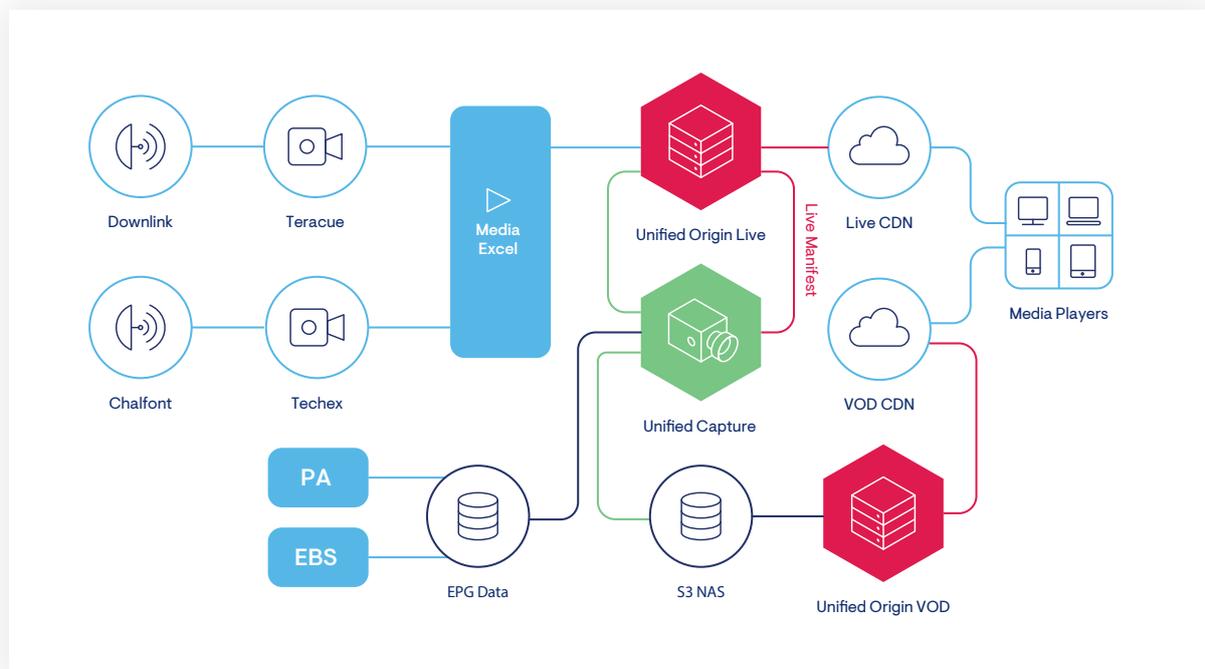
The launch of GB News on all platforms was accompanied by significant interest from the public. The first six months of streaming across the brand-new set of OTT services recorded over **3.2 million hours of content consumed**, with a tally of nearly **3.5 million unique users** accessing the platforms.



# BFBS: British Forces Broadcasting Service

Established by the British War Office in 1943, British Forces Broadcasting Service (BFBS) delivers the best of UK TV, sports, and music to British Forces and their families around the globe. BFBS approached Simplestream to rethink and expand the streaming service across multiple applications, with a few key objectives, primarily focusing on greater scalability for big live events delivered with several thousands of concurrent accesses.

Simplestream created a seamless experience for BFBS's users, by leveraging the cloud-based solution on the foundation of App Platform, and by creating on-demand content through the Live2VOD module (part of Media Manager), alongside Unified Streaming's Unified Capture, Unified Origin - VOD, and Unified Origin - Live.



The BFBS architecture utilizes two workflows: one for the live streams (ingested via hardware encoders), and another for producing catch-up assets through the Live2VOD module. Unified Origin - Live processes the live stream received through a data center link, packaging it into HLS and DASH files, allowing for playback from any device. Simultaneously, Unified Capture, which is set up on a separate server but also connected to Unified Origin - Live, requests the manifest for each program in the live stream. Differing from the process in place for GB News, the manifest produced for BFBS's live stream is for the entire program (start time and end time) taken from the EPG data, rather than being segmented. The project is naturally evolving towards a workflow that will ultimately allow BFBS to produce five-minute segments as part of a program, moving away from the less dependable operation of creating a manifest for an entire program. Currently, if the live stream drops during a program, the entire catchup file can be lost.

Due to rights requirements, some of the live streams and resultant catchup content require studio-level encryption, specifically DRM. By packaging the content with Unified Origin, the configuration can be applied to enable a Common Encryption Scheme (CENC). The main benefit of CENC is its ability to be decrypted by numerous DRM flavors, so there is no need to produce multiple versions of the same file with encryption for each individual platform. The encrypted MP4 catchup asset is then sent to Unified Origin - VOD to be processed and presented in the BFBS applications.

British Forces now enjoy over **40 live channels**, accessible through a **variety of devices**, including iOS, Android, Apple TV, Fire TV, Google TV, and Roku. The expanded services are a seamless, legal, and highly secure way for armed forces and their families to access the very best of UK TV.

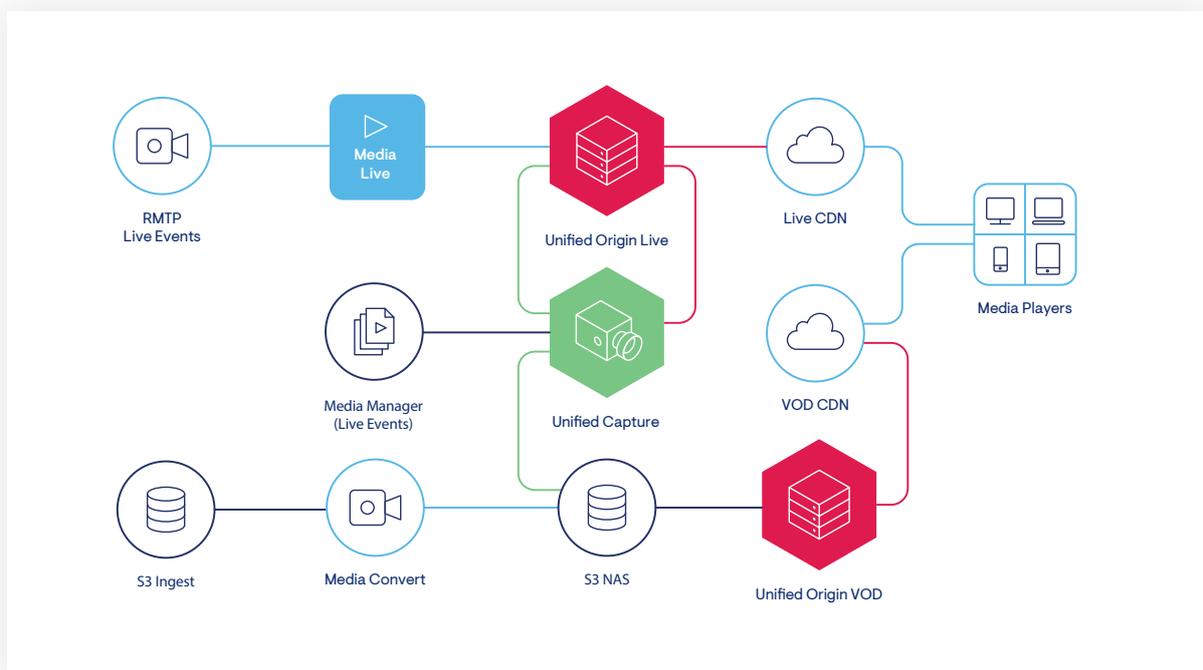
# bfbs | TV



## Digital Theatre

Digital Theatre chose Simplestream to create a set of OTT and streaming services across multiple devices and platforms, enhancing the monetization opportunities with hybrid business models that include subscriptions, rentals, and pay-per-view ‘as-live.’

Simplestream’s **App Platform** was deployed to launch Digital Theatre’s free-to-download applications across desktop, Android, iOS, and Fire TV. Many other platforms (including Roku) are also in development. App Platform supports a range of monetization models, seamlessly controlled via the proprietary content management system, **Media Manager**.



Unified Streaming's **Unified Capture**, **Unified Origin - VOD**, and **Unified Origin - Live** were deployed as integrations alongside the Simplestream suite of products, enhancing the tech stack. The architecture developed for Digital Theatre comprises two workflows. The first workflow creates VOD assets, while the other processes the streams for live events. The creation of the VOD assets involves Digital Theatre in the upload of the video file, metadata, and imagery to Simplestream's S3 bucket. The video file is then encoded using AWS MediaConvert and sent back to Simplestream to be stored with the data. Afterward, the VOD file is packaged into a multi-bitrate AVR format using Unified Origin - VOD, and then finally made available for playback in the Digital Theatre applications.

To create the live stream for live events, Digital Theatre activates an AWS encoder remotely and sends the event through this

encoder, also then stopping the encoder at the end of the event. During the time window in which the event stream is sent, it's also encoded through AWS MediaLive and sent to Unified Origin - Live. Simplestream also offers the ability to run Unified Capture against Unified Origin - Live, meaning that while the live stream is running, Digital Theatre can seamlessly create an MP4 catchup asset for the same event once it has concluded.

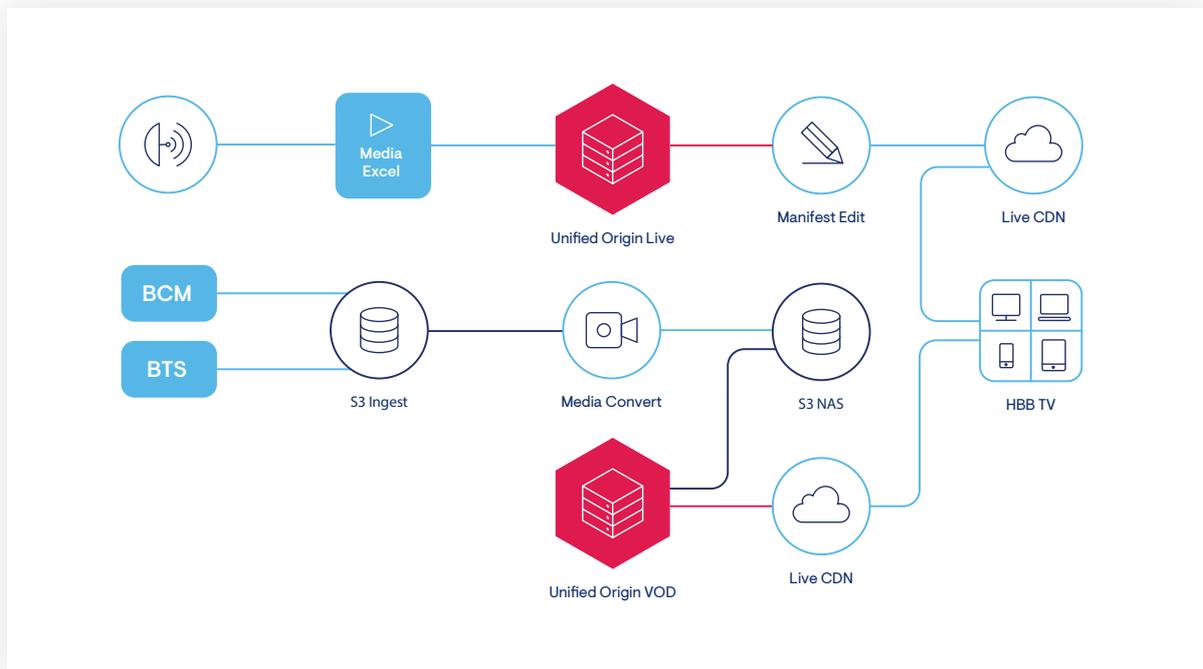
The delivery of Digital Theatre's set of OTT services marked the launch of the sector's first full digital lifecycle distribution platform: from pay-per-view live streaming and as-live productions, through to Subscription SVOD and Rental TVODs. To enable viewers to watch at a time and place convenient to them, on everything from personal devices to TVs.



# Narrative Entertainment

POP, together with its sister channels **Pop Max** and **Tiny Pop**, is part of Narrative Entertainment UK's portfolio of brands. The programming has a target audience of children between the age of 4 and 9 and includes a wide portfolio of kid-friendly TV series.

Simplestream was chosen to design and power a HbbTV solution for the TV channel, to allow POP to benefit from expanded reach and OTT-like big screen experiences on Freesat, Freeview, and YouView. The scope of the project grew to expand the reach to iOS and Android mobile devices, with the addition of functionalities to stimulate interactivity and enhance monetization opportunities through advertising.



The HbbTV solution developed by Simplestream brought all the benefits of OTT functionalities on big screens, including the ability for children to perform basic choices in terms of content consumption, such as accessing on demand sections, backward scrolling EPG from the platform TV guide, or lists of favorite series. POP utilizes both a live and VOD workflow to distribute content to their audience. The VOD workflow originates with the upload of video assets to Simplestream's S3 bucket from base Cloud Media, and BTS upload the metadata for these assets to the same location. Simplestream pairs each video asset to its respective metadata and runs these assets through AWS Media-Convert before being sent to **Unified Origin - VOD** to be packaged as multi-bitrate AVR format and made ready for distribution.

POP also has a live channel that's powered by Simplestream after receiving the feed from on-premise encoders, Media Excels. This is then sent to **Unified Origin - Live** to be distributed to the HbbTV POP applications.

For both workflows, Unified Streaming's **Manifest Edit** is used to optimize both the live and VOD content to be received by the Hybrid TV applications. This is an important part of the distribution process, as Hybrid TV apps require the manifest order to be rearranged.

The standard multi-bitrate streaming process for most applications usually sends the highest quality bitrate first, then optimizes to the best quality available depending on the quality of the viewer's network capacity. Manifest Edit is used to edit the manifest file containing the bitrate qualities, re-ordering them so that the medium quality is processed first, followed by the higher and lower qualities of the stream.



## ▶ Conclusions

Throughout each project that Simplestream has undertaken, the integration with the tech stack of Unified Streaming has significantly advanced the workflows for both live and VOD content. As mentioned in the introduction to this white paper, reducing the risk through mitigation of data and hardware silos is just one benefit of impactful tech integrations.

Among the other benefits of successful integration, redundancy is a prominent one. It reduces the risks often common to OTT platforms that distribute both live and on demand content. Through seamless integration with Unified Streaming's tech stack, Simplestream was able to power projects such as GB News and make it possible for the client to report **3.2 million hours of content consumed** within 6 months of launch.

The flexibility of Unified Streaming's suite of products, providing a simplified and optimized aggregation of content and processing for live and on-demand video assets, was key to the success of the projects analyzed in this paper. The combination of various workflows, including capture and dissection of a single stream into multiple, shorter segments, makes it possible for broadcaster and content owners to rely on a more secure and stable infrastructure, bringing to a minimum the level of risk for disruptions and working with Unified products to create the vast flexibility required to support the ever-growing OTT platforms. Flexibility in Simplestream's work provides their clients with bespoke and seamless integrations specific to the workflow required to deliver their project.

This study has detailed four use cases of the unique and bespoke integrations achieved with Unified Streaming's products alongside the Simplestream tech stack. The malleable properties of tech-agnostic workflows have ensured a successful launch for each of these customers, and the significance of this is shown in the various applications of Unified's products for each project.

