# ProMedia™ Suite

## Optimized Multiscreen Production and Delivery Workflows

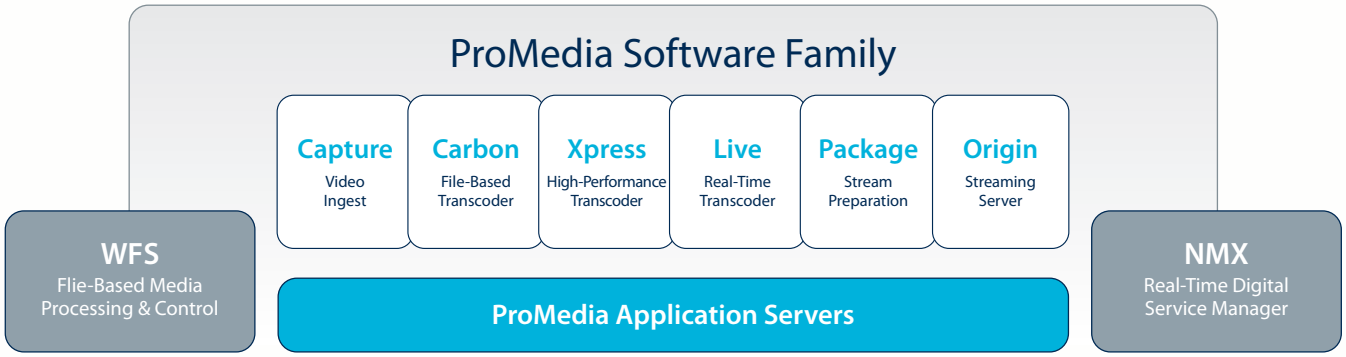
## HIGHLIGHTS

- Complete family of multiscreen processing and delivery applications
- Provides the best possible picture quality at the lowest possible bitrates
- Independent nodes scale to support a growing number of services/streams
- Integrates with numerous DRM, CDN and AMS vendors
- Fits easily into existing video infrastructures
- Supports all mobile and web services

Demand for more video on more devices continues to grow. For content creators and service providers, the challenge is to implement a video processing infrastructure that can support the required variety of acquisition, production and output file formats. In the production environment, media companies must transcode source content for editing and then again for playout. For operators, offering multiscreen services requires file-based workflows that support the delivery of video assets to multiple applications — including live streaming, video on demand (VOD) and live-to-VOD — using multiple streaming formats.

Harmonic's ProMedia™ family of integrated software and hardware appliances optimizes multiscreen production and delivery workflows with new levels of scalability, efficiency and flexibility. The first integrated, carrier-grade transcoding solution for live and file-based content, the comprehensive ProMedia suite performs a broad range of processing and streaming functions to enable high-quality video creation and delivery to all mobile and IP-connected devices.

ProMedia applications offer high performance and premium video quality for today's multiformat video services. The products can be deployed individually or as a complete, end-to-end video processing and adaptive bitrate streaming solution. They integrate with leading digital rights management (DRM) systems, media asset management systems and content distribution networks (CDNs) — in addition to other Harmonic products, including the Spectrum™ media server platform, Electra™ 9200 universal encoder, ProStream® 1000 with ACE® stream processor and transcoder, and Omneon® Mediagrid™ shared storage system.




### ProMedia Capture

The ProMedia Capture video ingest engine is the high-speed first link in an optimized ProMedia workflow. It's an integrated software/hardware solution for acquiring live and taped SD and HD video in real time and encoding it directly into the most-common editing and playout formats. The ability to ingest media directly into the Omneon MediaGrid shared storage system makes this content available to a variety of processing applications simultaneously, resulting in faster workflows.

### ProMedia Carbon

Powered by Rhozet® technology, ProMedia Carbon is a file-based transcoder that supports the largest array of acquisition, editing, broadcast, web and mobile formats. The system scales to support an automated multi-node transcoding farm under the control of our WFS™ file-based workflow system, and includes an open API that allows for the creation of custom workflows and third-party applications.

### ProMedia Xpress

ProMedia Xpress enables faster-than-real-time transcoding for the delivery of broadcast-quality VOD applications. Employing new Microgrid parallel-computing technology, the application splits large H.264 transcoding jobs into thousands of tiny ones, each of which is completed concurrently, dramatically improving transcoding performance over traditional processing platforms. ProMedia Xpress is a service of WFS and integrates seamlessly with the ProMedia Carbon transcoder and ProMedia Package stream preparation system.

### ProMedia Live

ProMedia Live is a real-time, carrier-grade video processor and transcoder featuring enhanced video codec technology. The application transcodes SD/HD MPEG-2 or MPEG-4 AVC content into multiple H.264 streams optimized to deliver the best picture quality for the bandwidth. Adaptive bitrate encoding can be split across multiple machines for efficient media processing at maximum speed.

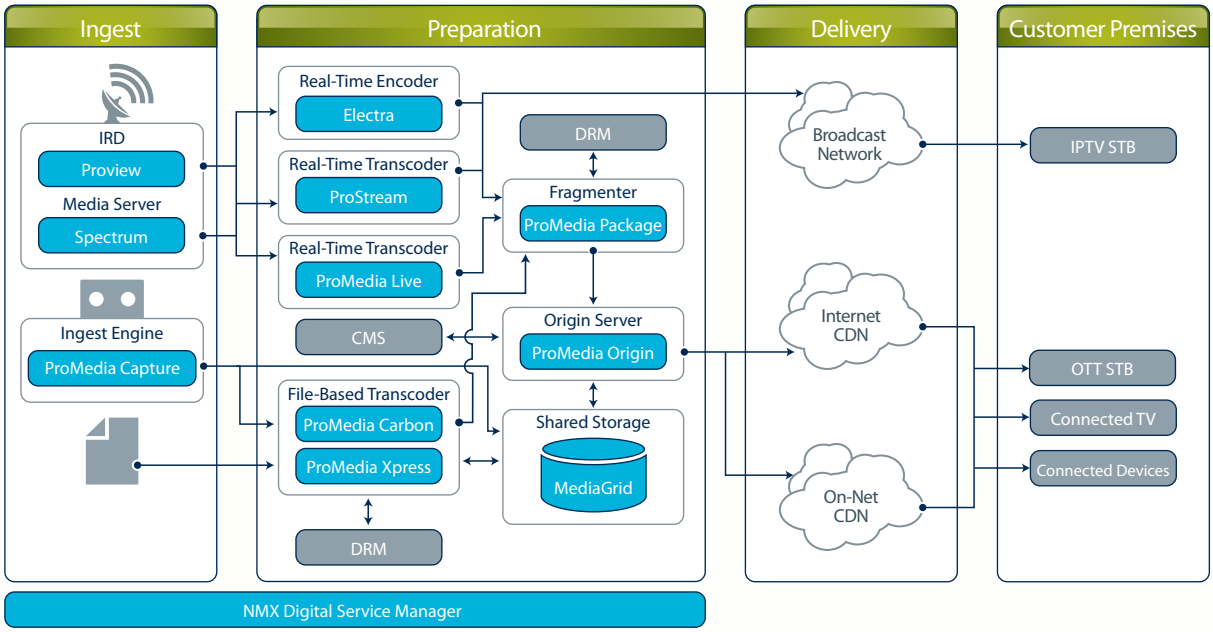
### ProMedia Package

The carrier-grade ProMedia Package adaptive stream preparation system packetizes content for secure delivery to high-value Internet video services. It can scale to support hundreds of simultaneous streams, and accommodates all major adaptive streaming protocol standards in use today, including Apple® HTTP Live Streaming (HLS), Microsoft® Smooth Streaming and Adobe® HTTP Dynamic Streaming. ProMedia Package also offers the flexibility to package to different formats from a single H.264 source. Encryption is made simple thanks to integration with multiple DRM vendors.

### ProMedia Origin

ProMedia Origin is an HTTP streaming video server for hosting a broad range of multiscreen services on a scalable, enterprise-class platform. Leveraging industry-standard streaming protocols, ProMedia Origin enables pay-TV services such as VOD, catch-up TV, start-over TV and nDVR to connected devices. The application ensures maximum interoperability with target devices and support from technology partners such as Adobe, Apple and Microsoft. ProMedia Origin is optimized to work with the MediaGrid active storage system and can scale to support thousands of simultaneous streams.

## Comprehensive Multiscreen Offering




### ProMedia Application Servers

A family of application servers is available to host ProMedia software applications. Designed to address the concerns of deploying Windows®-based platforms in mission-critical real-time environments, all ProMedia servers deliver the highest levels of system security and stability. They feature web-based GUIs to enable remote monitoring and management, and can also be controlled with Harmonic's NMX™ Digital Service Manager.

ProMedia 1100 & 1104

Choose from two 1-RU servers for hosting ProMedia Live: ProMedia 1100 features four GbE ports, RS-422 support and VDCP ingest; ProMedia 1104 adds four SD-SDI/HD-HDI ports to the feature set.

ProMedia 1110

A 1-RU server for hosting ProMedia Live or ProMedia Package, ProMedia 1110 features dual input, output and control ports, and enables packaging and encrypting of up to 25 multiscreen services.

ProMedia 1200

ProMedia 1200 is a 1-RU server for hosting ProMedia Live and ProMedia Package, either individually or as a seamlessly integrated solution.

ProMedia 2000

Two ProMedia 2000 configurations are available for hosting the ProMedia Origin streaming server: a 1-RU base model with 300 GB of usable storage for live-only deployments, and a 3-RU system with 6 TB of storage for small-scale deployments.

ProMedia 3102

ProMedia 3102 is a 2-RU server for hosting the ProMedia Capture video ingest engine.

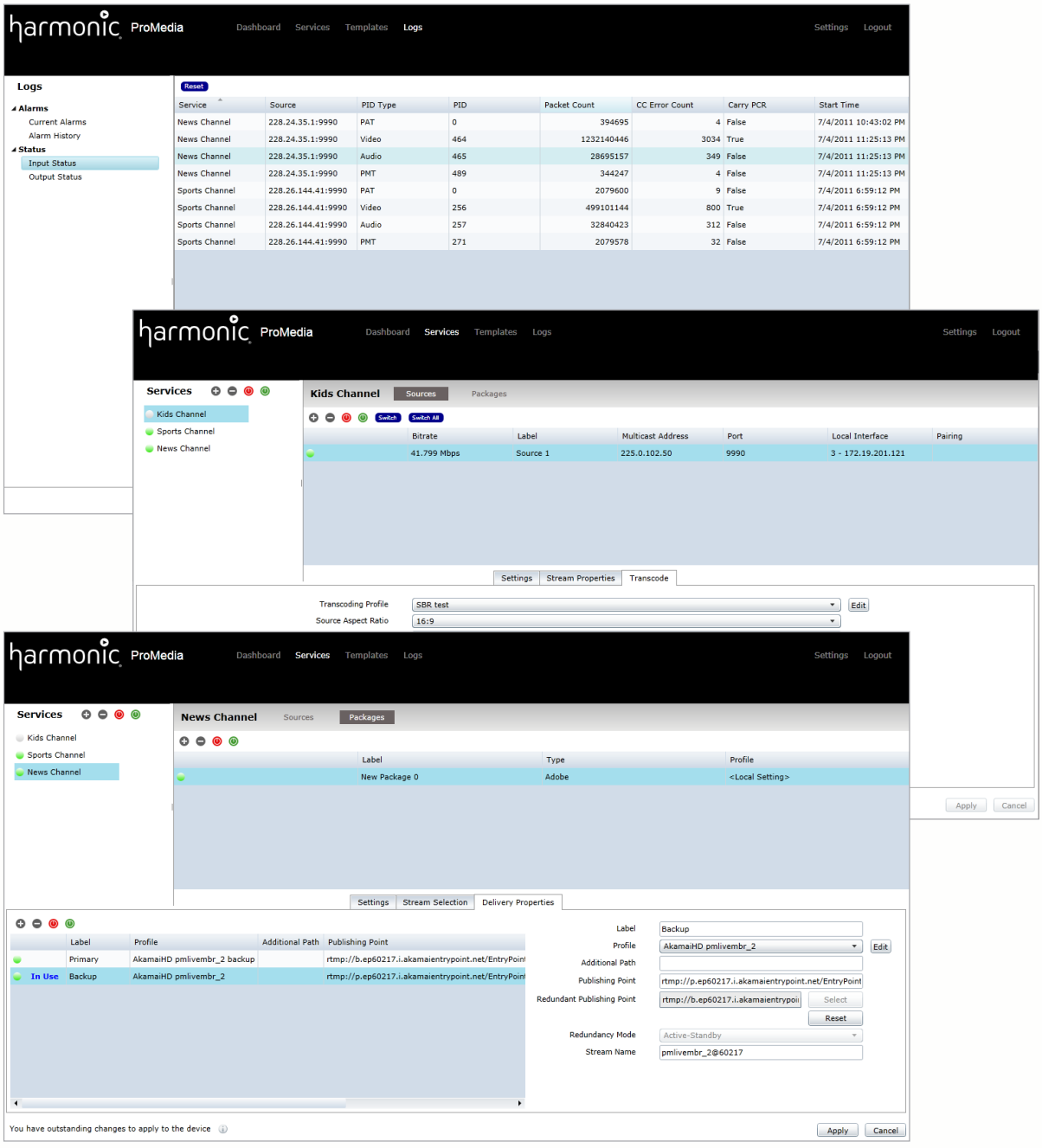
ProMedia 5200 Series

A 1-RU family of servers for hosting ProMedia Carbon and WFS, the ProMedia 5200 series is optimized to leverage its Intel® multicore architecture to achieve remarkable transcoding speed.

### Control & Management

For large-scale transcoding requirements, the WFS file-based workflow system combines and manages multiple ProMedia Carbon and ProMedia Xpress nodes in a transcoding farm. Powered by Rhozet® technology, WFS enables automated media processing that merges file-based transcoding and quality control into one unified workflow. The distributed nature of WFS allows for automated processing of high-volume transcoding tasks; failover support; job distribution, prioritization and notification; load balancing; FTP transfer; and status monitoring.

To aid network configuration, monitoring and management, ProMedia Live, Package and Origin can be controlled using the Harmonic NMX Digital Service Manager. NMX encompasses a powerful set of tools for managing the full range of digital video and audio services and systems. The system can monitor and control local and remote units across the video infrastructure, and scales to support hundreds of channels.




Pictured from top: 1) Monitoring for ProMedia Live and Package; 2) ProMedia Live transcoding; 3) ProMedia Package service configuration

## REAL-TIME WORKFLOWS

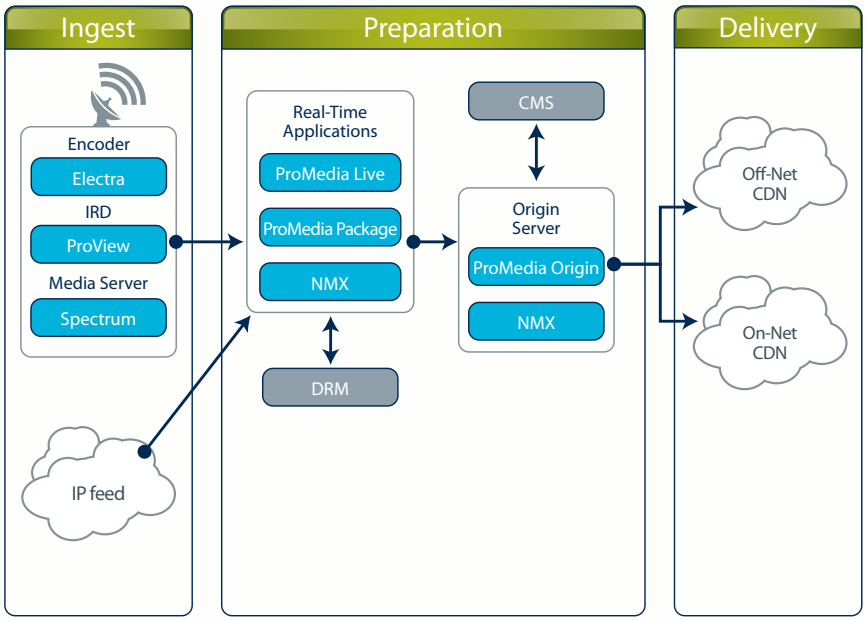
ProMedia software solutions are ideal for multiscreen applications such as live adaptive streaming for connected TV and mobile video devices, and live-to-VOD (catch-up TV, start-over TV, etc.).

### *Live Streaming*

Live content such as sports, news or other events is received from different media, decoded by an IRD and sent to broadcast encoders/transcoders for traditional digital TV transmission (terrestrial, satellite, cable or IPTV). For multiscreen applications, IRD or TSD outputs in SDI or IP can be used to achieve optimal quality and lower delay. Alternatively, encoded IP streams can be fed to ProMedia Live, which takes the input and transcodes it to the different formats required, then outputs a multi-bitrate transport stream.

ProMedia Package creates the playlist for Apple HLS, Microsoft Smooth Streaming or Adobe HDS and generates fragments according to the respective protocol specification. In addition, ProMedia Package performs encryption for Apple AES-128 and Microsoft PlayReady® DRMs. Communication with DRM servers is managed according to Harmonic's Key Management Server specification.

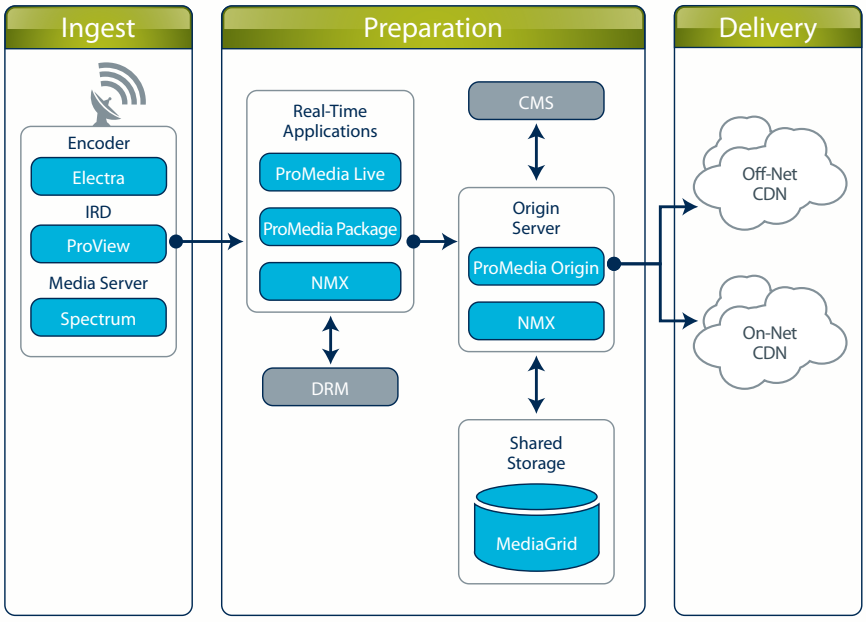
Once the content is prepared for streaming, the assets are sent to and stored on ProMedia Origin, which functions as the original publishing source for distribution to remote caches. ProMedia Origin uses existing HTTP protocols to communicate with the edge server, which can be located on-net or off -net.



### *Live-to-VOD*

Live-to-VOD in a multiscreen environment is best accomplished by caching assets in chunk format. ProMedia Origin performs this function by capturing the live channel in a sliding window buffer; the content can then be retrieved through a standard HTTP download. With this architecture, it is possible to offer start-over TV or catch-up TV services using the same infrastructure. Long-lasting catch-up TV content can be extracted from the sliding window buffer to become normal VOD content under the supervision of the Content Management System (CMS) using an open API.

The live-to-VOD architecture can be easily scaled, with more servers added as storage needs grow. The MediaGrid active storage system offers efficiency and cost savings in this scenario, as it can scale to support several days of storage for hundreds of channels.



## FILE-BASED WORKFLOWS

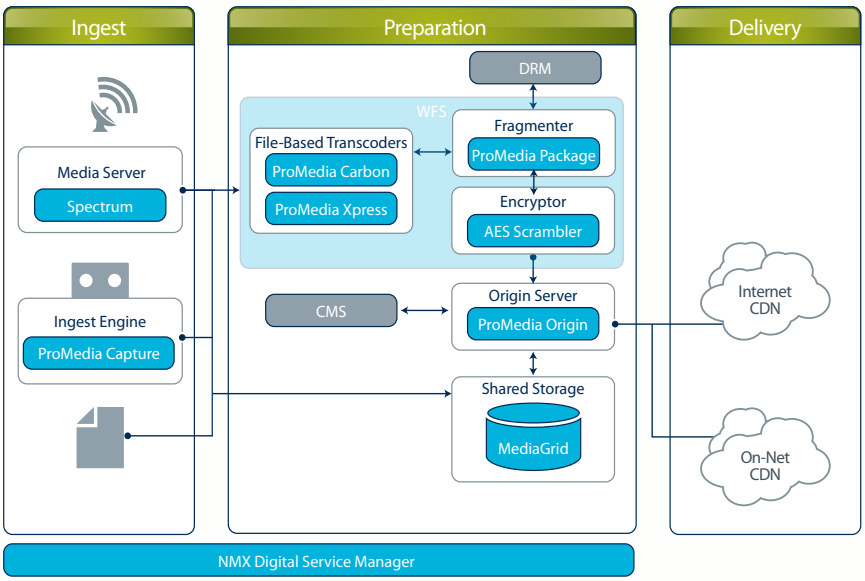
For applications such as tapeless production and over-the-top VOD, ProMedia software provides a reliable, fast and highly scalable solution.

### *Tapeless Production*

Post-production facilities are tasked with preparing content for more purposes than ever before, and ProMedia Capture and ProMedia Carbon provide the ideal solution for ensuring that all delivery formats are accommodated. ProMedia Capture efficiently ingests baseband SD and HD content, and can either store it locally prior to transfer to network-attached storage or send it directly to a shared storage system, such as MediaGrid, for subsequent processing by ProMedia Carbon. In addition to providing scalable active storage, MediaGrid speeds up the workflow by allowing editors to begin working the moment the content is acquired. Under the direction of WFS, ProMedia Carbon can perform high-volume transcoding, as well as preemptive special case jobs.

### *Over-the-Top VOD*

Transcoding speed and video quality are inherent challenges for service providers that deliver over-the-top VOD services. A workflow featuring WFS, ProMedia Carbon or ProMedia Xpress, and ProMedia Package addresses these pressures by enabling the efficient transcoding of broadcast-quality content. VOD content is received either through a catch system or a watch folder mechanism. Users can transcode these assets once and package them multiple times, reducing the need to perform repetitive, processor-intensive tasks and making it easier to accommodate a wide spectrum of delivery formats, including HLS, Smooth Streaming, HTTP Dynamic Streaming, Flash FLV or MPEG-4. In a multi-node farm configuration, users benefit further from the addition of high-performance MediaGrid shared storage. Once the packaged content is available, it is transferred either directly to the ProMedia Origin server or to MediaGrid for later use by Origin.



## MAXIMIZE CAPACITY & FLEXIBILITY

The software-centric approach of ProMedia applications helps optimize workflow capacity and computational resources in myriad ways. Some examples:

- Live and VOD services can be performed on the same hardware, increasing system versatility for operators.
- When launching new multiscreen services, the full VOD library needs to be encoded for peak load. With ProMedia, only refreshed content needs to be subsequently encoded.
- When new transcoding capabilities are required to accommodate increased content flow, ProMedia Carbon nodes can be brought online very quickly.
- In live streaming applications, special events such as sports tournaments often require high levels of support for multiple matches in the early rounds, but less support for the one final match. Thus, the multiscreen workflow needs to accommodate various load and storage requirements. ProMedia delivers this flexibility.

Modular and scalable, ProMedia applications are adaptable to both architecture design and operator preferences. If some users prefer to transcode and package in the same system but others want to package remotely and pair that function with the origin server, no problem. The ProMedia suite supports either approach.

Easily added to existing broadcast video infrastructures, the ProMedia suite fulfills today's requirements while assuring quick adaptation to future standards and devices. Managing the challenges presented by multiscreen production and delivery just got much simpler.

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