

Primary Distribution at the Cost of IP delivery with the Reliability of Satellite



Video Processing

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This solution brief explains how a true converged primary distribution platform enables content providers (CP) to deliver video securely to their multichannel video programming distributors (MPVDs) customers with flexible transmission options tailored to the changing environments they operate in.

In IP connected areas of the globe, content providers are embracing terrestrial transport or services like AWS for their primary distribution path and utilizing satellite transport as the secondary or backup route. In some regions, content providers can reach almost 90% of their service provider clients using Internet Protocol (IP) based distribution with sufficient bandwidth. This of course requires enhanced delivery technology, management tools and edge devices to be in place to allow reliable delivery over IP and to automatically failover

to other delivery mechanisms in the event of a failure.

Through Synamedia's portfolio and easy to use edge control toolset, content providers can protect their traditional Satellite driven revenue while offering a graceful path to complement or transition to a variety of terrestrial distribution technologies. As an end-result it allows the Content Provider to serve their market more cost-effective but as reliable as with traditional Satellite delivery systems.



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Market Landscape

Content Providers have traditionally relied on fixed Satellite transponders to deliver linear programming to a multitude of locations. All types of MVPDs rely on the single, Satellite BW conditioned stream including cable TV networks, IPTV providers, direct-to-home satellite companies, Over the Top (OTT) video aggregators and broadcast stations. For the most common linear programming, there are thousands of those receive locations with Satellite connectivity.

With the consolidation in the Service Provider (SP) world and their associated headend locations, the growth of fiber networks along with the availability of dedicated Content Delivery Networks (CDN) and more recently the adaptation of the Internet as a delivery path in this space, MVPDs and broadcaster have shifted to complement their satellite networks with terrestrial networks to deliver some of their content. This allows them to take advantage of the greater flexibility and potential higher reliability architectures associated with this new delivery technology.

The decision on the transition of linear distribution from satellite to terrestrial networks has to be put in context of the market being taken over by OTT, content on demand and targeted delivery services. This on top of the many other factors like technology cost, quality of service, manageability and reliability of those next-generation delivery mechanisms. Linear programming remains a very important segment especially with mature audiences, even with the growing desire of consumers to customize their programming to their viewing habits. Driving forces behind the ongoing popularity are easy to explain, some of the content like sports, news and other live and engaging shows require live broadcast. Linear content is still an ideal gateway for advertising due to the large audience exposure. Not to ignore is the ease to create new content and channels these days as advances

in technology has driven down production cost allowing many new content players.

Some of this new and more targeted content offers an opening for programmers to explore next generation terrestrial distribution methods with fiber-based options for high bandwidth mezzanine delivery to some of the major MVPDs, all the way to using the internet for the multi-point delivery needs of regional sports networks.

Choosing the distribution method for linear point to multipoint programming associated with primary distribution is a critical decision and requires a careful weighing of a variety of factors like cost, security needs, edge control and reliability.

Synamedia's primary distribution solution with the PowerVu Network Control (PNC) system along with the D9800 Network Transport Receiver, Virtual DCM and Video Service Manager offers the content owner the needed toolset to work in both delivery worlds.

Business Outcomes

Cost is one of the main factors driving the migration to terrestrial distribution, now that from a technology perspective (Quality of service, reliability, flexibility) terrestrial distribution offers comparable delivery results to satellite with additional capabilities.

Satellite distribution has some very prominent running costs like the need to staff or lease an uplink facility with antennas and the transponder space on a satellite that only makes sense through multi-year contracts. While Satellite costs have gone down, the lower costs of using managed fiber networks or the "free" internet along with the flexibility to change or evolve and higher bandwidth options has put terrestrial distribution ahead.

Content providers can now:

- Benefit from highly reliable and managed fiber connections for Mezzanine type of delivery.
- Use cost-effective Internet delivery for primary video distribution through protocols like Zixi, SRT, RIST to enable Satellite level of delivery reliability.
- Preserve existing workflow and operations while migrating from satellite to IP with support for traditional broadcast features
- For CDN enabled delivery, simplify distribution architecture by consolidating on OTT adaptive bit rate (ABR) and HTTP Live streaming (HLS) technology to cost-effectively reach affiliates while converting back to MPEG Transport Stream (TS) for traditional endpoint support



Figure 1: Value proposition of converged primary distribution

Synamedia's PNC and D9800 Edge Network transport receiver allows programmers to gracefully migrate any programming from satellite to terrestrial distribution methods where it makes sense, much more rapidly, and without big new capital investments.

High Quality, Cost Effective Transmission

Terrestrial IP distribution accommodates higher quality higher bandwidth mezzanine-level streams. Also, the need for costly long-term transponder leases is no longer required and allows content providers to deliver more targeted and regional content.

Advanced Monitoring, Management and Analytics

A single operations platform allows content owners to manage the satellite, terrestrial and OTT ABR delivery options from a single pane of glass, lowering operational cost.

The addition of IP connectivity to the Integrated Receiver Decoders (IRDs), allows faster and more effective troubleshooting lowering the Mean Time To Repair (MTTR)

Flexible and Reliable Distribution

The convergence of satellite and IP delivery provides operators with additional flexibility and a variety of redundant transmission options resulting in higher reliability and less down-time.

Solution Description

To enable the successful converged distribution of MVPD's linear channels, a solution is needed that supports several key functions:

- Solution cost: a cost-effective way to transport the multitude of services from a single uplink to many destinations

- Satellite has traditionally provided the most cost-effect solution for wide-spread geographic distribution where IP connectivity is not obvious.
- For a more targeted distribution of content like regional networks, CDNs or cloud/internet-based delivery offer cost-effective options
- For point-to-point and mezzanine transmission, fiber connection offers great cost-effective alternatives.
- Reliable delivery system: Primary distribution failures affect not only the SP business customer but all its subscribers as well with the result that thousands, possibly millions, of viewers can be affected with an inevitable major financial impact due to drop in viewership and loss of advertising revenues.
 - Satellite has a proven record and besides rain-fade and sun-spots, it is very reliable and not relying on a more complicated connected ground network.
 - CDNs and cloud/Internet rely on technologies that allow retransmission when issues in the delivery path arise but can be configured to be very reliable as well with some impact on latency.
 - Managed Fiber with redundant paths along with seamless switching, has proven to be very reliable with low latency.
- Security: only allow authorized destinations to receive streams
 - Satellite systems have relied on advanced systems to encrypt and authorize the endpoints even with the limitations of a one-way communication path
 - With Fiber, CDN and cloud/Internet based delivery, those authorization tools can be extended and offer further monitoring and control options through the 2-way path.
- Management: a control system to manage, monitor and administer the network
 - Satellite systems have relied on advanced systems to control the outputs and settings of endpoints even within the limitations of a one-way communication path
 - With Fiber, CDN and cloud/Internet based delivery, those management tools can be extended and offer further monitoring and control options through the 2-way path.

The PNC control system along with the D9800, Virtual DCM (vDCM) and Video Service Manager (VSM) provides a complete, end to end digital video compression, scrambling and reliable video distribution solution.

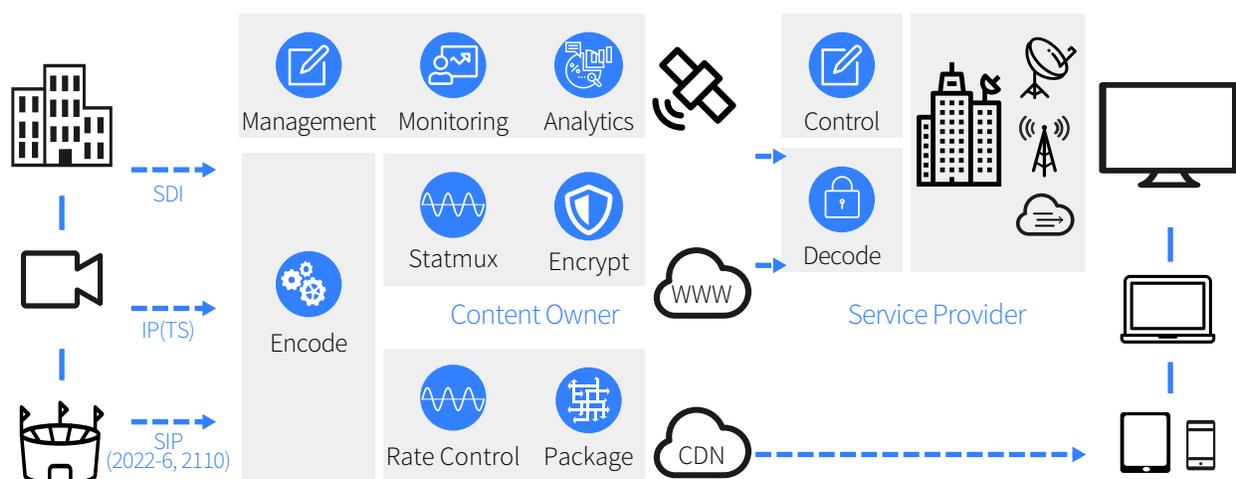


Figure 2: Primary Distribution over Satellite and IP

Key Capabilities

Premium Quality Video

The Virtual DCM represents a new generation of software-based video processing that runs on off-the-shelf servers and is built upon the foundations of the market-leading Digital Content Manager (DCM). It expands the well-known feature richness, picture quality, stability, and reliability of the widely deployed DCM platform in a flexible and configurable software package.

Virtual DCM enables content owner to deliver best-in-class viewing experiences while meeting service requirements for premium picture quality, bandwidth efficiency, and multiscreen transcoding/encoding. It delivers outstanding encoding quality using market-leading MPEG-2, H.264 and High-Efficiency Video Codec (HEVC or H.265) technology developed by Synamedia.

Our codecs provide excellent performance in bandwidth-constrained environments using advanced rate control for linear broadcast delivery and streaming and on-going improvements are easily implemented through software updates.

Hybrid Delivery

The Synamedia D9800 Network Transport Receiver is the most versatile receiver designed offering hardware configurability and Over the Air (OTA) licensing that allows content providers to customize the product to support the gamut of their applications. Designed to support High-Efficiency Video Coding (HEVC) and

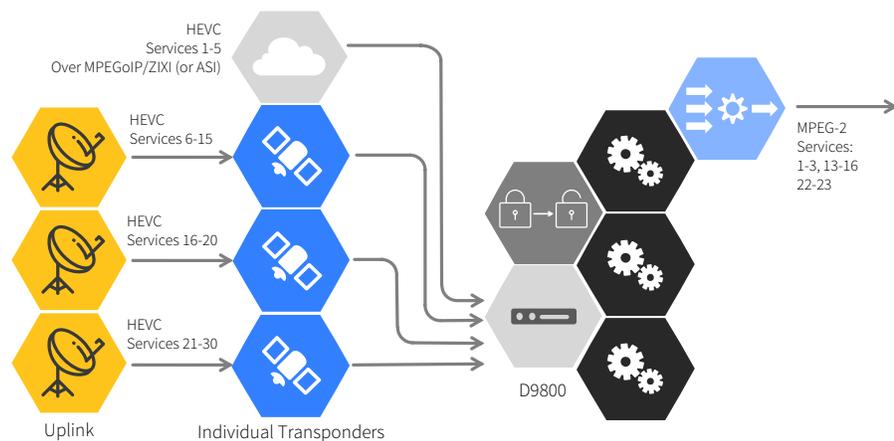


Figure 3: Hybrid Delivery

Ultrahigh-Definition (UHD) delivery over satellite and IP terrestrial content distribution networks requiring Digital Video Broadcasting - Satellite (DVB-S), Digital Video Broadcasting - Satellite - Second Generation (DVB-S2), and IP reception capabilities which future proofs for the next network expansion.

For content providers exploring migration from satellite distribution to IP, the D9800 offers several options that enable content providers a path to a graceful migration.

MPEG-over-IP is available for leased line fixed bandwidth applications, but for those that cannot be reached easily, the D9800 offers both HTTP delivery for Content Delivery Networks (CDN) and reliable Zixi transmission for transport over the Internet. Our solution is also built to seamlessly integrate with public cloud services like AWS Mediaconnect.

For these use cases, the outputs of the receiver remain transparent so any output application can be served with these new input sources.

As a platform for IP migration, the D9800 extends support for traditional PowerVu broadcast features to the IP link so you can gracefully transition from satellite to IP at your pace. This enables you to continue deriving revenue from linear content distribution models and advertising.

Security

Synamedia's digital transmission systems have been designed with particular focus on the fundamental requirement of security. This security element is critical and the PowerVu Conditional Access (CA) helps ensure that the operator has complete control over who is receiving their transmitted programming.

All content flowing through the PNC system can be scrambled and encrypted with the integrated PowerVu CA using tier assignments on the content and targeted IRDs. IRDs have Integrated Security Elements which remove the need for any CAM related HW when using PowerVu CA. The operator has an easy to use Interface for the day to day affiliate authorization management.

Remote Receiver Control

Every IRD managed by the PNC system is tracked in an integrated database allowing the Content Provider to detail all specifics related to the affiliate along with reporting tools tied into the database information. An API is also available for integration with 3rd party Business Management systems.

Another key capability of the solution is the ability to update licenses and software on the IRDs in the field over the Satellite uplink without the need to interact with the affiliates.

On top of the basic authorization options, the content provider can control the IRDs over the Satellite uplink related to outputs, resolutions, Ad Insertion PID processing amongst others.

The system comes with dynamic content scheduling options for blackout and service replacement during live events, like sports, that are tailored to the specific needs of the programmer

Monitoring, Management & Analytics

Synamedia's Video Service Manager (VSM) is a video processing management solution enveloping a powerful set of tools for configuring, monitoring and managing Synamedia's vDCM product suite and applications over unified or disparate geographic locations.

The VSM supports a diverse range of applications that allow operators and engineers with a service-oriented workflow management front end to operate and manage video signals delivery in digital video processing headend applications.

VSM offers following capabilities:

- Centralized Management - VSM is highly scalable and extensible. The client/server architecture supports both the centralized management of even the most geographically distributed environments, as well as the remote management of a centralized environment, all using standard IP technology
- Easy Lineup Changes - VSM Lineup Management and Scheduling allows users to easily modify and deploy new channel lineups on the fly with minimal disruption
- Template- and Wizard-Based System Setup - Adding, reconfiguring or removing services or equipment is fast, easy and error-free. Templating, wizards, consolidated data views and powerful cut-and-paste functions are available for both service and system modifications.

- Support for any deployment type - Monitor and control traditional hardware-based, virtualized video infrastructures as well containerized deployments

With the new connectivity to the IRDs enabled by IP based distribution, the PNC system monitoring capabilities are augmented by advanced analytics.

The system uses a secure communication path to the IRDs in the field to collect data and statistics that allow operators to faster troubleshoot with reduced Operational Expenses (OPEX) as a result.

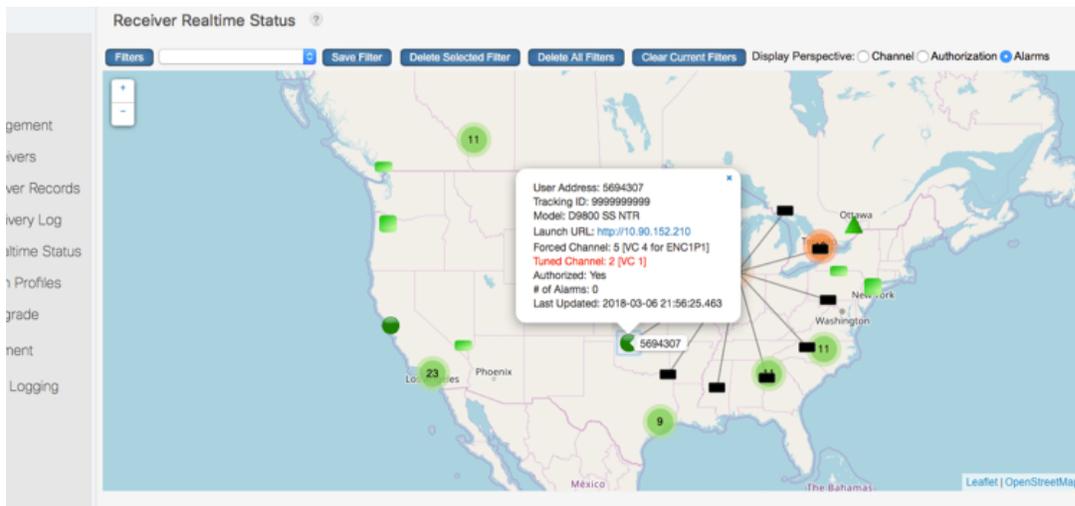


Figure 4: Receiver Management and Control Dashboard

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