

Digital Cinema & Content Delivery

Going to the movies is a favorite pastime around the world which allows us to escape from reality and have some fun—plus, it is big business. Indeed, movies have become an enormous economic and cultural phenomenon reflecting the rich diversity of the many countries where they are made.

Technology changes have significantly reduced the barriers to entry, as even low budget productions employing high-quality home camera equipment have resulted in award level results. In terms of distribution, technology has no less significantly contributed to expansion of the addressable market by lowering the cost and increasing the audience reach. Let's explore how.

The Problem and the Opportunity

Traditionally, the movie industry relied upon physical film prints on celluloid film that were copied and distributed to theaters. These prints can cost anywhere from a few thousand US dollars and up for each print, not to mention the cost of distribution, collection, and storage.

More recently, the industry migrated to digital distribution of movies on computer hard drives. A typical movie can consume from 80 to 300 or more gigabytes depending upon if the content is a 3D movie, 4K to 16K (Ultra High Definition) or an IMAX film. While distribution of hard drives makes for a more compact delivery method, essentially the same issues exist as with the distribution of cellulose film.

Physical distribution of any media format requires, quite obviously, time for shipping—the implication is that either movies must be distributed early enough to allow arrival at distant locations or that the movie can't open on the same day at all locations. Secondly, since the physical media can only be produced in finite numbers, the audience excitement surrounding opening day will have died down by the time copies of a film arrive in second tier theaters or theaters in outlying areas. This has a direct impact on the gross monetary intake the film can potentially generate.

Another major issue for the film industry is piracy—and we are not talking about Jonny Depp's character Jack Sparrow here. Estimates on the impact of piracy vary, but worldwide the impact certainly totals many billions of dollars. Film, to some degree and digital distribution on disks contribute to the problem because pirates are able to obtain copies of films making them available through file sharing networks—in many cases before the film is officially released!

Solving the dual problems of cost of media and secure distribution is now at hand.

Finding a Solution

Enter satellite content delivery.

As illustrated, by its nature satellite distribution has an inherent benefit over other electronic delivery methods of being a "send once, receive by many" system, called multi-casting. Satellite also provides ubiquitous coverage—as long as line of sight to the geostationary satellites above the earth's equator is visible, coverage is available. Just like direct to home (DTH) satellite television, the content is uplinked to the satellite and multicast to the intended receivers. This eliminates the variances in quality and availability of terrestrial bandwidth such as DSL, cable or fiber for theaters in different areas, ensuring a single, uniform system for reliable and timely delivery of the content. When combined as part of a comprehensive solution, such as the Hughes Enterprise Package Delivery (EPD) system, satellite distribution is ideal for the delivery of multi-gigabyte movie content.



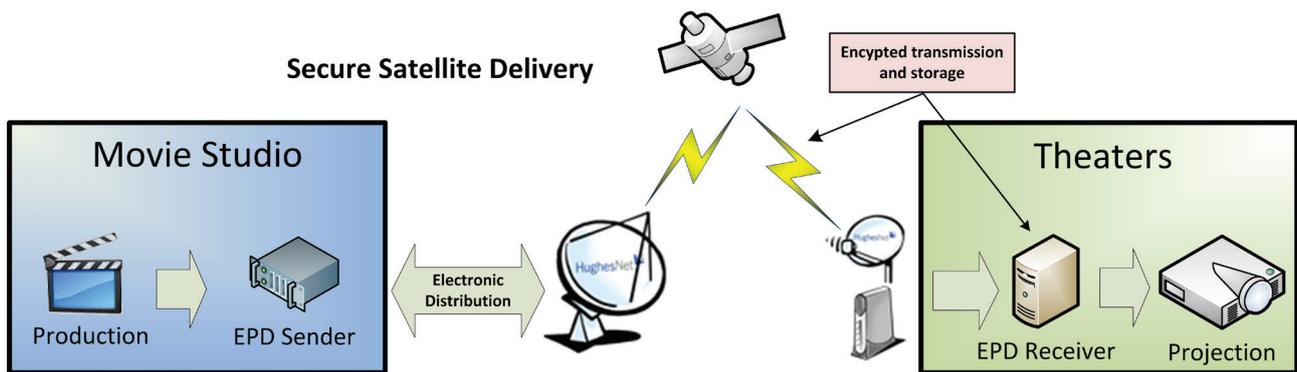


Figure 1. Secure Satellite Delivery

Hughes Enterprise Package Delivery

Hughes EPD is a content distribution service which provides a reliable means of transferring digital packages as files from a sender to a virtually limitless number of receivers simultaneously. The EPD sender accepts content from a provider, manages the multicast groups, initiates the file transfer, and controls the transfer operation. Each EPD receiver joins the multicast group, receives the file sent by the sender, notifies the local receiver application of arriving content, and typically provides reception status to the sender. The EPD sender can be programmed to deliver content at scheduled times, scheduled data rates, and to selected groups, individual receivers, or all receivers.

The Hughes EPD system ensures that each receiver, in this case the theaters, receives all of the movie content and is able to store the content in a secure server. In order to ensure delivery, the EPD system for theaters relies on acknowledgments which are sent back via the satellite return channel. Content is stored securely in encrypted files on a local server until it is ready for viewing, plus movies can be automatically purged after a predefined period of time—thereby eliminating the possibility of piracy. Various methods to protect the content are available including key distribution via the satellite link to unlock the content for single or multiple screenings.

On occasion last minute changes dictate the editing of a film, for example, due to a ratings body a film may be rejected for certain audiences. Satellite with EPD can drastically reduce the costs associated with these last minute changes and can even preempt transmissions already in progress.

Although the size of any given movie content file is enormous, the multicast capability of the satellite makes it very economical to deliver. Coupled with the ability to distribute this content on off-peak hours (e.g. at night) when utilization of the satellite bandwidth may be lower and thus less expensive, satellite becomes an unbeatable value proposition for distribution.

Case Studies

Indian Cinema

The Indian film industry as a whole is one of the largest in the world both in terms of the number of films produced annually and the number of theaters.

Naturally with such a large distribution chain, the Indian cinema industry was looking for a solution early on, eventually selecting Hughes to develop and provide a comprehensive satellite-based delivery system to several theater chains. Since its inception in 2005, the network has grown to over 7000 theaters, with revenue increase from first day showings and piracy cut by 20 percent or more.



Valuable Media Private Limited, under the brand name of UFO Moviez, is one of the world's largest digital cinema distribution networks in operation now. UFO builds, maintains and operates the network, and charges a fixed fee per showing. They utilize 11 Mbps DVB-S2 satellite bandwidth from their facilities at Hyderabad, India with a backup facility in Gurgaon, India.

Digital Cinema Distribution Coalition (DCDC) North America

DCDC is a coalition of content providers and major theater operators in North America set up to primarily reduce distribution costs. Among the theater operators in the coalition, there are well over 17,000 screens supported by satellite-based content delivery.

Deluxe/EchoStar LLC was selected by DCDC in 2013 to provide the delivery services. DCDC's use of the satellite network for distribution has helped to stabilize and reduce distribution costs and also allowed them to deliver advertising, pre-show, live, and customized content to their theaters.

The Deluxe/EchoStar distribution network is primarily built upon the HN/HX broadband satellite system from Hughes, providing coverage to theaters in the United States and Canada. As more theaters convert to full digital, the network will continue to grow.

ECHOSTAR®



Other Benefits of Satellite Delivery

Once a theater is linked via satellite, the connection can be used for other tasks related to the operation of a theater. Examples of additional uses are:

- Ticket sale credit card authorizations
- Daily reporting of ticket and concession receipts to headquarters
- Reorder of depleted concession goods (popcorn, soda, candy)

Even though film goers pay for the privilege of seeing a film, advertising is commonly still shown to them to subsidize the cost of maintaining a theater and increase profits. This advertising may be delivered via the satellite link to suit regional requirements such as language or dialect differences, local advertisers, etc.

In tough economic times theater owners may also be able to derive additional revenue from the big screen and seats available to them. Traditionally, "going to the movies" is an evening activity coupled with a nice dinner. During the daylight hours many theaters sit idle. A theater equipped with satellite content delivery is able to use this idle time to maximize profits. For example, a theater owner may be able to rent out a screen for corporate functions, viewing of closed audience sporting events, private screenings of films, etc. Any or all of these may be highly lucrative to the theater.

Theaters may also become part of the bridge over the digital divide by supporting, for example, universal service obligations (USO) and government broadcast to disadvantaged areas.



Summary

Satellite distribution, coupled with EPD systems, provides the ideal solution for studios and theaters to cut costs, reduce piracy, and generate addition revenues. Hughes is uniquely positioned to provide a complete solution for theatrical, corporate, or other content to huge audiences in regions, countries, continents or globally.

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