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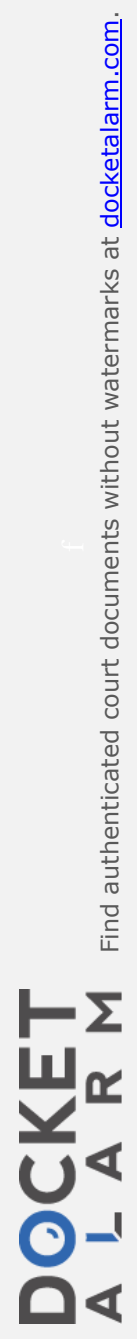
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today's Video on Demand (VOD), Subscription Video on Demand (SVOD), and the fast-approaching Television on Demand™ (TOD®) are enhancing the consumer television experience and creating new, exciting revenue opportunities and increased cash flow for cable operators and content owners alike. However, the technical requirements to support these services are becoming more demanding and complex. In VOD, cable operators are seeing solid buy-in rates, repeat purchase patterns, and concurrency rates of 3%-10% with limited marketing and promotional support. With recent trials of SVOD and an increased number of popular titles, concurrency rates have 'smoothed' the peak usage rates throughout the week to numbers that often approach 10%-20%. However, with Television on Demand (TOD) services, consumers will have considerably more programming choices including movies, subscription-based content, and the most popular broadcast content. It is anticipated that concurrency rates of TOD may steadily climb to levels that approach 30%-65% -- rates that mirror the total concurrent U.S. television viewing audience as measured by rating services such as Nielson.

Increased service usage, additional content, and new business models are challenging MSOs to conduct unprecedented network architecture preparation and planning. In addition, decisions related to

network loading, metadata and other issues need to be addressed to make Television on Demand a commercial reality.

This paper will address the issues and requirements associated with server ingest of broadcast content and content propagation. It will also discuss the architectural implications for the VOD server and propose a new class of server to support TOD requirements. The paper will also discuss how TOD content is managed through the creation and distribution of enhanced metadata formats in an environment that is controlled by studios, distributors, and cable operators.

New video server architectures and rules-based content control and propagation systems become integral contributors to the success of future on-demand services.

VOD/TOD CONTENT INGEST

The issue of the ingest of broadcast television content is one that will become more and more important for advanced video services such as Television on Demand to become a reality. As more content is made available and concurrency rates increase, architectural decisions will have to be made to support these increased demands on the network. A new architecture comprised of higher density VOD/TOD servers with the capability to ingest

movie title. Using an encoding rate of 3.375 Mbps and an average movie length of 100 minutes, the total size of each movie was roughly 2.4 GBytes. A typical installation might contain a library of under 100 movies and was capable of streaming to less than 1,000 subscribers simultaneously.

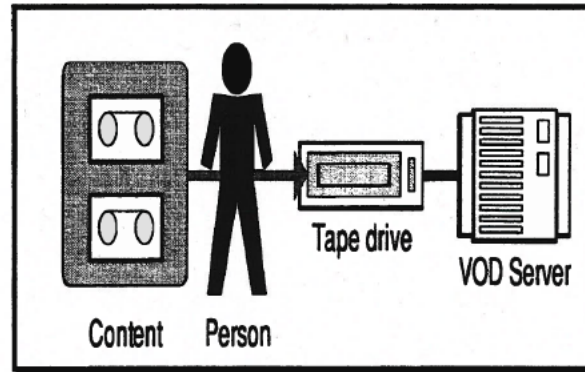


Figure 2-1 Content Ingest for VOD in the past

In early VOD deployments, metadata or other business rules weren't typically supplied with the content. The operators themselves were responsible for deciding what rules applied to particular content and for entering the appropriate rules into the VOD server or control system. This relatively simple model meant that most of the attention was focused on the billing interfaces, set top box (STB) client, and head-end control. With low stream counts, movie titles could be loaded during off-peak hours when the VOD server had more

beyond the simplistic example described above. VOD installations now enable 1,000 to 3,000 customers to access a library of 150 to 300 movies. As a result, shipping tapes to VOD enabled head-ends has proved to be a logistical challenge and has evolved to a newer model called pitch-and-catch, where content is distributed by private broadcast to remote stations and syndication partners via satellite (see Figure 2-2). With increased library sizes, increased stream counts and more diverse suppliers sending data, the distribution and propagation of content has shown itself to be quite a challenge. Content can still arrive on tapes and is caught by catchers along with trailers, posters, and rules that are required to put it all together.

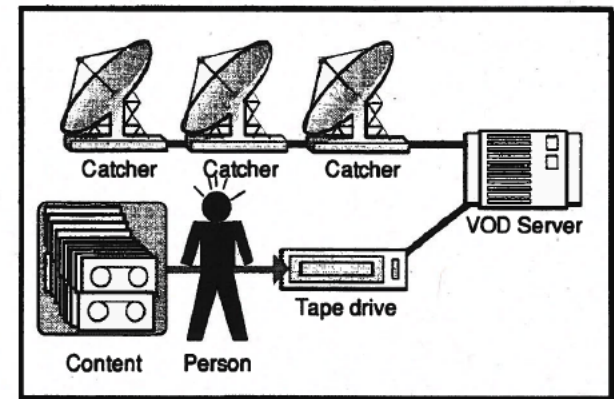


Figure 2-2 Content Ingest for VOD today

Content aggregation companies have risen to the challenge by offering services to edit, adjust, and compile these diverse formats and metadata into a nice bundled

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