

The new World of IPTV

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The IPTV Opportunity

- **The cost to deliver video streams to the home has fallen dramatically with new technology**
- **Advanced Video Codecs reduce transmission, storage and server cost by 2X over MPEG-2 and make high-definition streaming practical**
- **Open standards have accelerated innovation and will ensure a competitive environment**

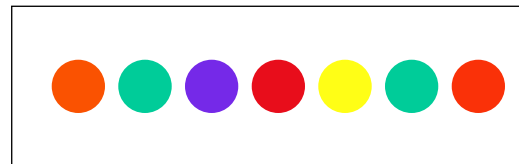
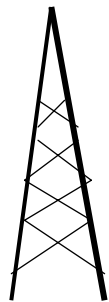
IPTV will drive revenue and subscriber retention, adding significant value beyond basic Internet broadband service

IPTV Key Ingredients

- **Virtual Private Streaming enables to serve each subscriber a customized video stream**
- **Advanced Video Codecs reduce transmission, storage and server cost by 2X over MPEG-2 and make high-definition streaming practical**
- **Open standards accelerate innovation and will ensure a competitive environment**

IPTV will drive revenue and subscriber retention, adding significant value beyond basic Internet broadband service

Multicast (Cable and Satellite today)

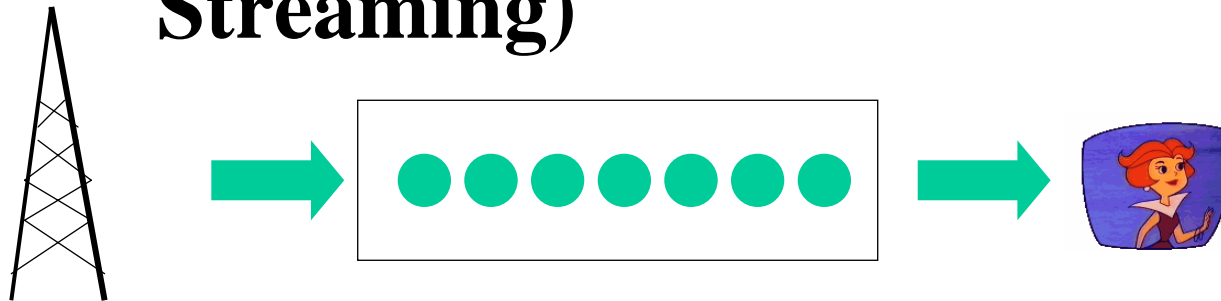


Headend transmits all content into one broadband pipe

Receiver selects from the available content channels

The content selection function is in the TV or Set top box, limiting content choice to the available multicast channels

Unicast (Virtual Private Streaming)



Headend offers unicast streaming from content vault

Each Receiver selects one content channel at a time

The content selection function is moved upstream, which enables unlimited amount of content that can be offered

Multicast vs Unicast Comparison

	Multicast	Unicast
Amount of Content	Hundreds of Video Channels (limited by available bandwidth)	Unlimited Content (only limited by size of storage vault)
Bandwidth Required	Proportional to the number of channels	Proportional to the number of receivers
Private Streams	Adds to the required bandwidth	Standard

A Unicast network offers unlimited content private streams and can emulate a Multicast network but not vice versa

What about Unicast Cost?

- **The technology cost to deliver unicast streams has declined to low double-digit per stream**
- **A unicast settop box is significantly cheaper than a multicast settop box with PVR**
- **The networking bandwidth for pure unicast is also lower than for multicast with PVR**
- **As a result, it is simpler and cheaper to build a unicast IPTV network**

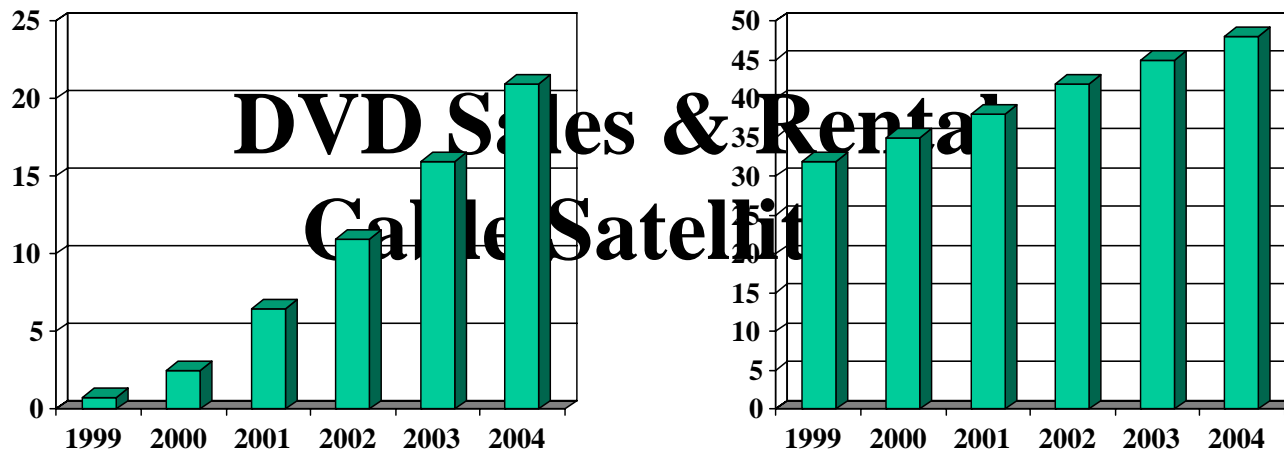
More importantly, Unicast offers superior ROI

Unicast is where Revenue

- **Movies on Demand**
- **Television on Demand**
- **Relevant Video Advertising**
- **Membership Video Content**
- **Local and Regional Content**
- **Educational and Instructional Video**
- **Fine-grained Parental Access Control**

Unicast enables video services that drive both customer acquisition and retention and are not feasible with satellite

U.S. Consumer Spending on Video



Cable spending was driven by rate increases, DVD represented truly new consumer demand

Movies On Demand

- **Home video has been the biggest new revenue driver for Hollywood in history**
- **\$25B annual revenue dominates the business**
- **\$15.5B in DVD sales and \$5.7B in DVD rental**
- **Over 1.5B Movie DVDs sold in US in 2004, a 33% increase from 2003**
- **Cumulative total: 4B DVDs sold, 40,000 titles**

Home Video is the single largest revenue to Hollywood, but is Blockbuster and Netflix the best way to deliver it?

Why Netflix is a problem for

- Under **first sale doctrine**, DVDs can be rented and/or sold over and over and over
- While Netflix has entered into revenue sharing arrangements, the numbers look as follows:
- Netflix: 3M members, \$500M in revenue
- Revenue sharing with Hollywood: \$82M
- US Postage costs: \$114M
- Viewing events: 150M (10% of US DVD sales)

Hollywood makes \$0.60 per Netflix viewing event, less than the US postal service receives per transaction

Movies on Demand Works

- **Higher revenue to content owners**
- **No renting or reselling of used DVDs**
- **More convenient for customer: previews, no delay, instant impulse purchases**
- **Assuming a \$19.99 per month subscription and 50% revenue share each 1M subscribers result in \$120M revenue to Hollywood**

This is more revenue with 1M subscribers than Hollywood makes today with 5M DVD-by-mail rental subscribers

Movie-On-Demand

- **Movies on Demand are even with the US postal service as the delivery channel**
- **Library size, ease of selection, personal history, and recommendations are very important**
- **The average Rental subscriber watches 1 movie per week or 52 movies per year**
- **Over 20 years, the average subscriber will view about 1000 unique movie titles**

Take rate should be significantly higher with on demand delivery model over IPTV broadband network

Why Ranking is so important

1. With 30,000 movie titles how do you chose?
Genre, history, previews, recommendations
2. Positioning is very important, most consumers never look beyond the first couple of pages
3. For sponsored content, positioning drives revenue.
For movie content, it is underestimated how much this can drive margin for the service providers.

The IPG provides the key value of guiding the consumer choice, which ultimately sells the content

MOD over IPTV Summary

- **Customer convenience is key, including personal history and recommendations**
- **Movie previews are a key demand creation tool that is underexploited today on the Internet**
- **Library size is important for large audience
30K titles needed to match existing offerings**

Movies on Demand is a predictable business opportunity that is fulfilled today via \$25B in DVD+VHS sales and rental but can be delivered more conveniently and profitably with IPTV

Television on Demand

- **Customers love the convenience of PVRs, especially the ability to skip ads**
- **With Unicast Everywhere, the same function can be provided more cost-effectively centrally**
- **With a central or network PVR function, the consumer can start and stop any time, but ad skipping can be controlled**

The advantage is that the ad insertion behavior is completely under central control, and can range from no-skip to mini-ads (fast forward ads that are 10 seconds instead of 30 seconds) to any other business model that is acceptable to advertiser

Why is Ad Skipping an Issue?

TV Ad skipping Losses to Hit \$27 Billion over Five Years

AdAge.com, April 14, 2005

Ad skipping and on demand viewing could cost the TV industry \$27 billion in lost ad revenue over the next five years, according to new research released today by Accenture.

Given the projected growth rates of PVR devices, the above estimate is most likely low. Over the long term PVR devices will completely change today's economic basis of Television.

Can Ad Skipping be fixed?

- 1. Offer consumers a service that is more consumer friendly than the current model**
- 2. Offer personal relevant advertising that has much higher value than broadcast ads**
- 3. Don't offer consumers settop PVRs that encourage them to skip the advertising**

The conflict between ad supported content and consumers not interested in not relevant to them can only be solved by increasing the relevance of advertising.

Relevant Video Advertising

1. Relevant Search based advertising has been the biggest growth driver in Internet advertising
2. The same idea applied to video will dramatically increase advertising effectiveness
3. Existing examples: movie previews, BMW films, travel advertorials, virtual house tours, etc.

There are 100,000s of travel destinations, homes for sale, fashion shows, music videos, movie previews, etc. etc. Consumers need more efficient ways to find information before making a major purchases or other decisions.

Relevant Ad Revenue Model

1. The consumer selects relevant ads and the advertiser only pays when the ad is seen (click through model)
2. Strong potential for bidding for positioning (most consumers don't look beyond the first page)
3. Opportunity to link ad to business transaction and get compensated on actual transactions

This is the same model that Google pioneered for the relevant advertising on the Internet and that is completely rewriting the rules of how to advertise on the Internet.

There is reason to believe that relevant advertising will work very well in an IPTV video-on-demand network because consumers want information on topics they are interested in.

Relevant Video Ad Potential

1. Relevant Internet search market: \$23B by 2010
2. Relevant search video could easily reach 10% of the US \$67B video broadcast advertising market and perhaps much more over time
3. Because of the proven effectiveness of relevant advertising the revenue value per ad seen is many times higher than traditional advertising

Most likely the broadcast advertising market will decline as spending shifts to better ways to reach the consumer

Membership Video Content

1. This is content that is of interest to members that are willing to pay a monthly fee to access it
2. Classical example is on-line dating but the concept extends to many other affinity groups
3. Key opportunity is sports teams that want to allow their subscribers to access all their games

While it will take a while to grow membership subscribers, much of the content is already available today and the total amount of potential content is staggering.

Local and Regional Content

1. There is a large amount of local and regional content ranging from city hall proceedings to the local high school football games
2. Key thing to recognize is that the cost of capturing and producing local and regional content has dropped and will continue to drop
3. With on-demand access, local content use has the potential to increase significantly

While local content has limited commercial value it has high political value and is relevant to subsets of the subscriber base

Educational Content

1. Education is a very large potential market. There are 15.6M students in higher education in the US plus many professions have ongoing certification programs
2. Much education can be delivered effectively via video, avoiding the need to be physically present in class-room
3. Unicast on-demand is the required technology to deliver a wide range of educational material

Educational content has high value to very narrow groups and can be delivered cost-effectively over unicast video

Instant Channel Change

1. Channel change time with conventional digital video Multicast systems is frustrating to users
2. Problem is inherent in the nature of advanced video compression with decoder requiring the next I-frame before it can commence decoding the video stream
3. Unicast Streaming solves this problem naturally by splicing each new stream on a I-frame boundary

Unicast streaming greatly improves channel switching time which is a significant user satisfaction issue with multicast

Parental Access Control

1. Fine-grained parental access control is a requirement for a successful offering
2. MPAA ratings are not sufficient nor are available for much of the potential content
3. Access control must extend to previews, recommendations, and all other content
4. Safest way to control content is at the source, not in a “V-chip” in the television or settop box
5. Parents must be able to control what their children see

It must be a children safe and family friendly environment
Otherwise the system will not be accepted in the market

The ultimate IPTV

Seamless integration of current television with on-demand access to movies and sponsored content, guided by personalized preferences and parental access controls

True individualization makes video entertainment a much more useful service than the historical channel format and provides a key differentiator to cable and satellite

Number one driver for IPTV will be positioning as a service that you cannot get from existing satellite or cable

We are at the verge of a transition from the traditional broadcast entertainment model and broadcast ad model to a consumer driven entertainment and advertising model

What about Satellite and Cable?

1. Direct TV will offer 150 national and 500 local H.264 HD channels by 2007 with settop DVRs offering time-shifting and movies on demand
2. Cable has no choice but to follow satellite and go through an expensive plant and STB upgrade
3. Neither can offer the on-demand everything capability of a properly designed IPTV network

The highest differentiation is with highly interactive video services that satellite and cable cannot offer. Therefore interactive services are key to success

Conclusions

1. IPTV's technology advantage is unicast streaming which enables it to offer on-demand everything
2. Unicast enables new revenue models with VOD, relevant video advertising, membership content, plus local, regional, and instructional content
3. Unicast serves consumer and commercial needs that are not served by cable or satellite today
4. It is very important to design the IPTV network to enable unicast streaming everywhere
5. Without differentiated value, IPTV will face an uphill battle against cable and satellite