Video Solutions – Today and Tomorrow

Traditional Sources

Community Sources

Then
- Broadcast
- Limited content
- Single video device
- One national line-up
- Scheduled viewing

Now
- Personalized, On Demand
- Unlimited content
- Multiple devices
- Real time Mash-ups
- Rapidly changing content popularity
- Social community, user generated

IP bridges the Consumer Driven Experience gap:
**What** They Want. **When** They Want It. **Where** They Want It. **How** They Want It.
Internet Streaming - Pervasive
Offering “Over-the-Top” Consumer Video Services

- OTT Providers Offering spectrum of UGC & Premium VoD with Advanced Navigation
- Service Providers can Partner with OTT Providers to Generate Delivery Revenue
The logical questions to ensure a competitive advantage for an SP are...

- Which services do consumers want and when?
- Which services will drive both customer retention as well as profitable growth?
- How will the consumer experience be managed?
- Which service strategies will competitors pursue to differentiate their platforms?
Video services of Today..... and Tomorrow

Table Stakes
- Bundles Services
- Data
- Voice
- EPG
- Digital
- Cable
- Video

Differentiation
- VOD
- OTT
- Family Calendar
- Video on TV
- Start Over
- Nanny Cam
- Long-tail Content

Future Services
- My Content Anywhere
- Video-presence
- Targeted Advertising
- Unified Communications
- 3rd Party Services
- Home Security
- One Voicemail
- Niche TV

Value Creation

today

time
In Europe SPs could increase satisfaction with improved content choices

Reasons for Dissatisfaction with Current TV Service (Q3/08)
"Q325. Why are you less than fully satisfied with your cable/satellite TV service?"
(Among BB HHs unsatisfied with video service)

Source: GDL: Entertainment 2.0 in Europe
Sample base: 5,069 broadband HHs in Europe
© 2008 Parks Associates
Overall, consumers seem to love the “on-demand” entertainment experience

Opinions of Those Having Both PVR and on-Demand 1-10
Cable VOD Users Also With a PVR

- Having a DVR, I don't really need on-demand
  - 19% (8-10)
  - 37% (4-7)
  - 44% (1-3)

- Having on-demand, I don't really need a DVR
  - 22% (8-10)
  - 78% (4-7)

- My cable service is better because I have both on-demand and DVR
  - 75% (8-10)
  - 19% (4-7)
  - 6% (1-3)

8-10 – Strongly agree with statement
4-7 – Somewhat agree with the statement
1-3 – Do not agree with the statement

Source: Leichtman Research Group, 2006
“Start Over” and similar services shows promise

1. Service lets consumers watch previously aired programs within specified time frames
   - TWC – select networks within programming window
   - Virgin – select shows within 7 days

2. Attractive to consumer who do not understand time shifted TV
   - Very simple

Source: Company web sites
On-Demand TV growth…typical

Video On Demand Usage (Comcast)

1.4Bn+ VOD in 2007
2.130M Hrs each month
3. Customers view On Demand 27X a month on average
4. 90% Free VOD

Source: Company Web Site
Most countries are seeing an uptick in VOD usage

Changes in Video-on-Demand Service Usage (Q3/08)

"Q315. How would you characterize the frequency at which your household is watching on-demand programs today compared to two years ago?"
(Among broadband HHs with VoD service)

Source: GDL: Entertainment 2.0 in Europe
Sample base: 5,069 broadband HHs in Europe
© 2008 Parks Associates
Broadband video is emerging as another form of on-demand

Is Internet Video Decreasing the Primetime TV Audience? (Q3/08)
"How would you characterize the frequency at which you are watching primetime television shows compared to two years ago?"
(Percentage of U.S. Home Broadband Users)

- Watching More Primetime TV (%): 53%
- Watching about the Same Primetime TV (%): 46%
- Watching Less Primetime TV (%): 18%

Source: Parks and Associates 2008
16.8 Billion Videos Viewed Online in the U.S.
In April 2009 alone: 16% increase from March alone

- 152 Million users in USA watched videos
- 6.7 Billion video views from YouTube
- 512 Million - Fox
- 397 Million - Hulu
- 355 Million - Yahoo
- 315 Million - Viacom
- 272 Million - Turner
- 202 Million - CBS
- Videos watched

- 63.5 - YouTube
- 8.7 - Fox
- 7.8 - Yahoo
- 9.9 - Hulu
- 5.5 - CBS
- 9.1 - Viacom
- Videos per user

- 107 Million - YouTube
- 59 Million - Fox
- 45 Million - Yahoo
- 40 Million - Hulu
- 37 Million - CBS
- 34 Million - Viacom
- Users watched

- 6.4 Hours (385 Minutes) average per user viewing
- 2.4% Videos, but 4.2% of minutes by Hulu
- 387 Million videos watched by 49 Million viewers at MySpace
- 3.5 Minutes average duration of online video
- 111 online videos watched by an average viewer

Source: ComScore June 4, 2009
5B Videos Viewed Online in the U.K. in April 2009
Overall 47% Y/Y Growth; BBC Moving Forward

- 2.4 Billion video views from YouTube
  - 58% Y/Y Growth
  - 50% of UK internet users watched videos on YouTube
- 79 Million video views from BBC
  - 67% Y/Y growth
  - iPlayer phenomenon
- Each of top ten video properties with Y/Y double digit growth
- 35 M ITv
- 31 M Megavideo
- 20 M Channel 4
- 20 M Dailymotion
- 19 M FOX
- Videos watched

- 96% of UK internet users were exposed to some form of display ads
- 60% of UK internet users exposed to 971 Million online display ads on multimedia sites
- 621 Million online display ads exposed on YouTube

Source: ComScore July 6, 2009
BBC iPlayer
Market Disrupter

1. Launched December 2007
   1 million+ programs streamed each day
   Download and store for up to 30 days
   400 hours of new content per week
   75TB/day current average
   180TB Peak during Beijing Olympics

2. 10% of entire UK Internet traffic
   Peaked at 20% during Olympics
   Streaming : Download Usage = 8 : 1

3. ISP Costs +200% since iPlayer Launch
   Increase from 6.1p to 18.3p per user
   ISP business models broken

4. But what would happen if it was available on your Television
   Consider 20x capacity growth…
**Hulu Market Disrupter**

1. Hulu: A joint venture of NBC Universal and News Corp announced in March 2007
   - US $100 Million initial investment
2. Built on MySpace’s social networking leadership position
3. Focus on professional content – hit TV shows, movies and clips
   - AOL, Comcast, MSN, MySpace, and Yahoo!
4. Advertising revenue model

- Top 10 US online video site - 226 Million video views in November 2008
- Bundles & sells remnant ads unsold by the content providers. Retains 20%-30% of directly received ad dollars or pays to syndicates
- As per screen digest analyst, 2008 revenue is US $70 Million as compared to YouTube’s US $100 million and projected to be same as YouTube revenue (US $180 Million) in 2009
Internet Video Opportunity

A Global Phenomenon
1. 12 Billion streams in US in May ‘08 – 190 Million active viewers in US by 2012
2. In UK, France and Germany, 8 Billion streams and 80 Million active viewers December ‘07

Opportunity to double TV ‘prime-time’
1. Most online video viewed in the home – online video is incremental to TV viewing
2. “Prime-time” TV viewing: Weekdays 8PM-11PM
3. Peak online viewing: Weekdays 5PM-8PM

Business Models
1. Streaming, advertising models dominate – >$6B in advertising revenue by 2012
2. Premium video is getting the bulk of the revenue vs. user generated content
   ABC’s 2007 revenues almost double YouTube’s (ABC is making money)

Sources: eMarketer, The Pew Internet and American Life Project, Comscore press release – July 08, BBC
CDS is Designed to meet All Next Gen Video Services Trends
“Infinite” Content, Live and On-Demand

1. More HD “channels”
   More than 1000 HD choices
2. Massive VoD Libraries:
   To TV – 6000+ movies per month this year
   To PC – Exploding number of Internet Video Portals
   To Mobile / Handheld Devices
3. Time Shifted TV
   “StartOver”: Play Current TV Program from Start
   “LookBack”: Play Any Program within LookBack Window
   “RewindTV”: Pause, Rewind and Catch Up to Live
4. Internet Video, User Generated Content on TV
5. Any Stream to Any Screen
6. Targeted On-Demand Advertising
   Significant Opportunity to Boost Ad Revenues

“The vision is to give our customers the ability to watch ANY movie, television show, user generated content or other video that a producer wants to make available On Demand”
Brian Roberts, CEO Comcast - CES 2008
Cisco Content Delivery System Vision

Enables any content, any device, any location from a single, open delivery platform.

- Broadcast TV
- On-Demand TV
- Online Video
- Games and Music
- Personalized Video
- Internet Video (Flash, Move)
- Longtail VoD Content
- 3-Screen Delivery
- OTTP App Acceleration
- StartOver / Lookback

Linear
- On Demand
- Time Shifted
- Personalized

Content Delivery System
Cisco CDS Global Customer Base
Tested and Proven
## Next Generation Architecture

<table>
<thead>
<tr>
<th>Distributed Intelligent Extensible Architecture</th>
<th>Independent Scalability of Content Storage, Cache and Streaming</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non-stop Service Availability</td>
</tr>
<tr>
<td></td>
<td>Adapts to Any Network Topology</td>
</tr>
<tr>
<td></td>
<td>Supports multiple content applications: TV, Internet, Wholesale CDN, 3-screen, personalized content, advanced advertising</td>
</tr>
</tbody>
</table>

## Key Technology Differentiators

<table>
<thead>
<tr>
<th>Intelligent, Scalable Caching</th>
<th>Global scalability. Eliminates the need to hard provision network services or predict client usage patterns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Converge live and on-demand</td>
<td>One-platform for on-demand and real time media services (live, time-shift)</td>
</tr>
<tr>
<td>High Performance</td>
<td>Highly bandwidth efficient. Multicast enabled. Optimized for ingest, caching, streaming</td>
</tr>
<tr>
<td>Multi-protocol support</td>
<td>MPEG SD/HD, H.264, HTTP, WMT, Flash, QuickTime, Move Networks</td>
</tr>
</tbody>
</table>
Cisco CDS Product Family
The Platform for Network Video Applications

1. **Content Delivery Engines (CDEs)**
   - Optimized Hardware Appliances forming a modular network infrastructure

2. **Content Routing Control Plane**
   - Core Software Primitives
   - High Service Availability, Deployment Scalability, Flexibility and QoS

3. **Content Delivery Applications**
   - Service Specific CDS Content Delivery Application Modules (CDAs)
   - Acceleration for Service Provider / 3rd Party developed applications
   - Acceleration for OTTP applications
   - Easy to expand to future applications
   - Open interfaces to back-office systems
# CDS Content Delivery Applications

## TV Streaming (CDS-TV, CDS-VQE)
- **Content Library**: Content Ingest for On-demand, Unicast TV
- **Caching Node**: Massive, Hierarchical Caching
- **TV Streamer**: TV Streaming to End Devices
- **TV PlayOut**: PEG Content and Other CBR Play Out
- **VQE Server**
- **VQE Client**: IPTV Error Repair and Fast Channel Change
- **Video Navigator**: Real-time VoD catalog

## Internet Content Delivery (CDS-IS)
- **Content Acquirer**: Acquires Content from Internet Sources
- **Internet Streamer**: Multi-protocol Internet Content Download & Streaming
- **Service Router**: Intelligent Content Routing
- **Service GW**: Proximity, Network Binding, Peering Services

## Advanced Applications & Services
- **Time-shift TV (MediaX)**
- **Targeted Advertising**
- **3-Screen Session Shifting**
- **Hyper-Syndicated Video**

* Planned
Cisco CDS-TV
Designed for Video 2.0 and Long-tail Deployments

1. Video 2.0 Long-tail Trends
   Consumer Behaviors Require Next Generation VoD Systems to Scale to Serve “Long Tail” Content

2. Cost-Optimized Storage Technology
   Different Types of Storage Have Different Cost Scaling Rules

3. Multi-Tiers Intelligent Streamer Cache
   Most Popular Content Available from Streamer Array Cache
   Tier 1: DRAM
   Tier 2: 1TB Disk
   Long Tail Content Made Available within 300ms from Content Library Array Disk
   All Content Perceived As Local by Subscriber

Intelligent Caching Algorithm for Dynamic Content Positioning
Video On Demand Reference Architectures

Architecture 1: Standard VOD
Architecture 2: VOD + Time Shift TV
Reference architecture: Std VoD
Reference architecture: VoD + Time Shift TV
**PRODIS - Overview**

- **Functionalities:**
  - Asset Management
  - Product Management
  - Generate catalogue
  - Reporting
TRAXIS – Transaction Management

- Receive customer & product info from PRODIS
- Resource management
- Transaction management
  - Determine pricing and create entitlement
  - Authorize streaming
- Store and forward transactions to PRODIS
Introducing the Cisco RF Gateway 1

Extends fourth generation, proven QAM architecture (2.5M streams shipped) with support for SDV, 1Ghz, DOCSIS 3.0/M-CMTS with leading performance, density and scale

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cisco RF Gateway 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leading Density</td>
<td>48 channels in compact 1RU chassis with 4x frequency stacking</td>
</tr>
<tr>
<td>Maximum Spectrum</td>
<td>50Mhz – 1Ghz (Agile)</td>
</tr>
<tr>
<td>Performance &amp; Scale</td>
<td>Supports up to 2048 Streams (over 42 streams/QAM)</td>
</tr>
<tr>
<td>Full Redundancy</td>
<td>IGMPv3; Dual power, timing and inputs</td>
</tr>
<tr>
<td>Supports all U-EQAM</td>
<td>SDV, VoD, HDTV, NGOD, Broadcast, DOCSIS 3.0 over M-CMTS, Cisco Wideband</td>
</tr>
<tr>
<td>Standards-based Applications</td>
<td></td>
</tr>
<tr>
<td>Low Power Consumption</td>
<td>&lt;350 watts</td>
</tr>
</tbody>
</table>
Summary VOD architecture

1. Product Management & VOD Catalogue generated by PRODIS
2. Transaction & Resource Management handling provided by TRAXIS
3. Centralized and/or Distributed VOD server solution based on CDS
4. Session based encryption of VOD content:
   – CA: Powerkey, Nagra, NDS, irDeto, Conax, Simulcrypt
   – RG Gateway 1D as scrambler
5. STB integrated with multiple MW and Application components:
   – MW: OpentV, Powerkey, NDS,...
   – Application: TeleID, Zappware, Mirada,...
6. Interface towards CRM/Billing via PRODIS
SVOD – TVOD - FVOD
Trick Play
Search functionality

1. Search by Person
2. Search by Title
3. Search by HD
Search functionality
EPG - Horizontal
PVR functionality

- Pirates of the Caribbean: Dead Man's Chest
  - Jack Sparow wordt op de hielen gezeten door Davy Jones, kapitein van het schip De Flying Dutchman. Hij weet dat de Edeel niet aan het spelen is.

- Duurzaam werkt
  - RTL7
  - 12:32 - 12:33
  - Magazines
  - Informatief. Informatief magazine dat zich richt op de bewustwording van ondernemen Nederland. Met reportages van bedrijven die

- More:
  - Info
  - Delete Recording
  - Change Lock
  - Change Protection
  - Rename Recording
  - Rename Folder
  - Move to Folder

- Pirates of the Caribbean: Dead Man's Chest
  - Movie
  - Channel: 101 Film1.1
  - 17:35 - 17:35

- Delete
  - Do you want to delete this show?
  - Pirates of the Caribbean: Dead Man's Chest
  - 101 Film1.1
  - 5, Mar 17:35 - 17:35

- Yes | No
Dual Recording
Time-Shift TV
### Time-Shift TV Video Services Summary

1. **Start Over®:**
   - User Experience: Ability to Restart a Live TV program from the beginning
   - Requires Real-Time Ingest capability on video server
   - Requires User Interface to “start a live program over”
   - Requires Ability for Define Business Rules on which programs are Start-Over enabled

2. **Look Back®**
   - User Experience: Ability to select and watch past broadcasted programs within a pre-defined time window from the live point. Selection happens through EPG menu navigation
   - Requires Real-Time Ingest capability on video server
   - Requires Ability for Tag which programs are in the Look Back Window

3. **Rewind-TV**
   - User Experience: Ability to Pause, Rewind and Fast Forward time-shifted programs up to the live point and switch back to the Live Broadcast
   - Requires Real-Time Ingest capability on video server
   - Requires Ability store content on a rolling buffer window and allow user to switch between time-shifted (unicast) and live broadcast (CDS Core)

4. **nPVR**
   - Network Based Personal Video Recorder (Tivo experience without PVR in the home)
   - Subscribers can store their preferred programs and play them for n days
Managed Media Solution for Online Video Streaming
Cisco’s End to End Solution

- Portal / Navigation
- Consumer Devices
- Asset Management / Entitlement
- Content Security
- Encoding / Transcoding
- Content Distribution
- Reporting
- Policy
- Internet Streamers
- HUBS
- CDS Service Router
- Internet Streaming Manager
- Content Acquirer

Cisco's solution integrates various components to manage and deliver content efficiently.
Cisco Eco-System, Strategic Partners
System Integration
Multi-point integration taking under our wings

- Portal
- Client(s)
- DRM
- Reporting
- Billing
- QoS
- Asset mgmt
- Encoding
- Transcoding
- OSS
CDS Internet Streaming Functions

Content Delivery

Deliver Content to IP devices

- HTTP Caching, Download, Progressive Streaming, with Bit Rate Pacing
- Live Unicast or Multicast
- Windows Media VoD & Live
- Flash Streaming VoD & Live
- H.264 VoD & Live
- Quick-Time VoD
CDS Internet Streaming Functions
Ingest, Distribution, Routing, Delivery, Reporting

Acquirer Ingests Content from Origin Servers
Origin Servers = Master VoD Content Repository or Live Encoder
Content Acquirer Ingests VoD, Live, Data to “Root of CDN”
HTTP, HTTPS, FTP, CIFS, RTSP

Distribution to Internet Streamers
Rules-Based Pre-Position and/or Dynamic Cache Miss-Fill
Intelligent Multi-Tiered Distribution Paths Built Dynamically
VoD and Live Dynamic Tree Building for Optimized Distribution

Service Router Client Request Re-direction
Global and Local Load Balancing Requests to Streamers
Streamer KAL and Load-Info continuously sent to SR
Extension of DNS for Domain Delegated to CDN

Internet Streamer Multi-Protocol Delivery
OnDemand & Live Streaming (Unicast and Multicast), Download
Windows Media, Flash Media, QuickTime/RTSP, & HTTP

Streaming Servers Content Reporting
Detailed Transaction Logs for Each Delivery Event
Integrates with 3rd Party Content Reporting and Analytics
Cisco Managed Media Solution

Summary

1. Architected for fast, reliable real-time content delivery
   - Any Content – Video, music, games
   - Any Device – Streaming to TVs, PCs and mobile devices
   - Any Location – Via cable, wireline and mobile networks

2. Streaming Standards Based:
   - Microsoft Windows
   - Adobe Flash
   - Quicktime

3. Automated workflow for all services

4. Scalability and availability
Any Screen Video Offering

<table>
<thead>
<tr>
<th>Next-Gen Services</th>
<th>Cross-Platform Content</th>
<th>New Paradigms</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Real-Time Services (StartOver, LookBack)</td>
<td>• Internet content to the TV – end of the TV walled garden</td>
<td>• Personalized Video Advertising</td>
</tr>
<tr>
<td>• Cross-Screen Book-marking</td>
<td>• Long tail content available everywhere</td>
<td>• National CDN – network sling, near real time access to any content</td>
</tr>
<tr>
<td>• Hyper Syndicated Video</td>
<td>• User generated content &amp; the Virtual Couch</td>
<td></td>
</tr>
</tbody>
</table>
Cisco CDS: Platform for Next Gen Video Services

Example Deployment Strategy (1/5)

Build Scalable Content Delivery Platform

PHASE 1
Cisco CDS: Platform for Next Gen Video Services

Example Deployment Strategy  (2/5)

PHASE 1
Build Scalable Content Delivery Platform

PHASE 2
Launch Targeted Ad Insertion

Programs (VBR)
SCTE 30
SCTE 35

VOD Assets

Back Office

Ad Decision Service (ADS)

Campaign Manager

DCM (Splicer)

DVS629
TV Recorders

Ads
Cisco CDS: Platform for Next Gen Video Services

Example Deployment Strategy (3/5)

PHASE 1
Build Scalable Content Delivery Platform

PHASE 2
Launch Targeted Ad Insertion

PHASE 3
Enable Time-Shift TV

Enable Time-Shift TV

Launch Targeted Ad Insertion

Build Scalable Content Delivery Platform
Cisco CDS: Platform for Next Gen Video Services

Example Deployment Strategy (4/5)

**PHASE 1**

- Build Scalable Content Delivery Platform

**PHASE 2**

- Launch Targeted Ad Insertion

**PHASE 3**

- Enable Time-Shift TV

**PHASE 4**

- Add Internet/Mobile Streaming
Cisco CDS: Platform for Next Gen Video Services
Example Deployment Strategy  (5/5)

- Lead Hyper-Syndicated Video
  PHASE 5
- Add Internet/Mobile Streaming
  PHASE 4
- Enable Time-Shift TV
  PHASE 3
- Launch Targeted Ad Insertion
  PHASE 2
- Build Scalable Content Delivery Platform
  PHASE 1
1. Flexible topology, central / distributed/ hybrid
   Could start with centralised streaming and distribute as
   stream count grows – without service disruption

2. Single platform for VOD, nPVR, Catch Up, Time
   Shift, SDV, Targeted ads…….
   Cost effective to add new applications to existing
   platform

3. Storage efficiency and automated content
   distribution
   Large content libraries can be maintained in a central
   location cost effectively, and no content pre-
   positioning necessary

1. TCO benefits
   Cost optimised mix of commodity storage media
   Low Bandwidth usage
   Low overhead operating and admin
Internet Video & Web 2.0 Example: BBC Uk iPlayer

- **BBC iPlayer, Catch-upTV.**
  
  - P2P Download (Jul07)
  - Streaming (Dec07)
  - Devices: iPhone/iPod Touch, Wii, Nokia N96...
  - HD, Live, Intl, Archives... (Planned)

- **Internet Traffic Considerations.**
  
  - Huge traffic surge (1% of @ peakhour traffic (dec), 5% (mar), 7% (jun), 15% (olympics))
  - 700K Videos/day (Apr08)
  - Streaming vs Download = 8:1
  - Bitrate: 500Kb (VP6) => 800Kb (H.264/AAC+)
  - 3PB/month traffic forecast by Dec08 (BBC)
  - ISPs & BBC argue about Traffic Costs (OFcom: +0,8B£ by 2011)

- **Illustrates the new collaboration opportunities between OTTs and ISPs (ex. CDN).**

Source: Cisco IBSG
Screen Shots

- Featured on BBC Home page
- Click to stream
- Click to download
- Watch the stream
- Click for full screen
- Supports every program of every BBC radio station
Telco & Media Collaboration
BBC-iPlayer on Virgin Media Cable TV…
DailyMotion on NeufCegetel IPTV.

**What**
Consumers are massively adopting OTT Video Services such as BBC iPlayer, DailyMotion…
OTT Video reduces SP revenue & relevance
OTT Video increases SP network costs.
Platform shifting brings popular Online Video content into the SP Walled Garden.

**Why**
Keep or re-capture customer attention.
Complement Internet OTT offer.
Less expensive, Higher Quality, Walled Garden Video delivery compared to Internet delivery from OFFnet destinations.
Leverage 3 screen delivery.

**Considerations**
May require investment in Walled garden infrastructure & user interface.
1. Pioneer of the Web 2.0 wave on video

2. Launched in France in March 2005

3. Explosive growth in French speaking territories:
   - Leader in France
   - Top 10 in key French speaking countries
A Multiplatform distribution…

Instant Messaging

Portable Media Devices

IPTV

Web

Mobile

I-Phone
High definition InternetTV
Zattoo – Swisscom Network Collaboration

Switzerland: Zattoo in improved quality on Swisscom’s VDSL network

Berne, 4 June 2008 - From now on, Swisscom and Zattoo will be working together in the area of online television. Swisscom VDSL customers are set to benefit from the partnership, as they will be able to receive the 20 most popular Zattoo TV channels of the more than 70 available in improved quality (HiQ) free of charge.

What
Zattoo/Swisscom launch New “HD” Live P2P InternetTV for VDSL users (1,5Mbits).

Service is Free, Ad sponsored, BUT user has to be a Swisscom IPTV customer.

Zattoo already provides “standard” P2P InternetTV (0,5Mbit/sec) in a few EU countries (CH, ES, UK, BE...)

Aug08: HD channels also available for non-swisscom-vdsl users for 2,3€/mo.

Why
Swisscom: Improved sales for VDSL & IPTV Services (Zattoo has 10-times more @TV cust. than Swisscom has IPTV cust.)

Zattoo: Users get better InternetTV experience => Stay longer => More Ads.

Considerations
Will this partnership prove the viability of large-scale HD P2P InternetTV versus IPTV (cannibalisation)?

Will Zattoo be allowed to reduce costs by decreasing the P2P deficit (up=down)?
Telecom Italia’s Yalp! Web Portal Enabling A Differentiating User Experience

1. “Community TV”: offers consumers the creation, publication and sharing of their own TV channel

2. Professional video content live & on-demand to PCs
   - 19 major national & international TV channels
   - On-demand library of approx. 40,000 movies, TV programs, music, news, and sports
   - Most of content is free

3. Portal is open & free in Italy only to all broadband subscribers (9+ million)

www.yalp.it
HD could help improve the overall content offering

1. HDTV sales projected to continue in Europe

2. HD service subscription has an opportunity to follow growth curve to provide content for HD screens

Source: ScreenDigest, Blu-ray Market Overview, 2008
European VOD usage data varies

Video-on-Demand Service Usage (Q3/08)
"Q312. How often, on average, do you watch programs using your on-demand TV service feature?"
(Among broadband HHs with VoD service)

<table>
<thead>
<tr>
<th>Country</th>
<th>% Using VoD Service at Least Monthly</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.K.</td>
<td>73% (n=156, ±9%)</td>
</tr>
<tr>
<td>Italy</td>
<td>62% (n=61, ±13%)</td>
</tr>
<tr>
<td>Spain</td>
<td>56% (n=140, ±8%)</td>
</tr>
<tr>
<td>Germany</td>
<td>46% (n=41, ±15%)</td>
</tr>
<tr>
<td>France</td>
<td>35% (n=113, ±10%)</td>
</tr>
</tbody>
</table>

Source: GDL: Entertainment 2.0 in Europe
Sample base: 5,069 broadband HHs in Europe
© 2008 Parks Associates
European homes average between 5-7 views per month

**Number of Movies Watched Using VoD Service (Q3/08)**

*Q313/314. On average, how many movies per month do you watch using on-demand services? (Among broadband HHs watching movies using VoD service)*

<table>
<thead>
<tr>
<th>Country</th>
<th>Median # of Movies Watched Per Month Using VoD Services Among Viewers</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.K.</td>
<td>2</td>
</tr>
<tr>
<td>Italy</td>
<td>3.0</td>
</tr>
<tr>
<td>Spain</td>
<td>2.0</td>
</tr>
<tr>
<td>Germany</td>
<td>2.0</td>
</tr>
<tr>
<td>France</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Source: GDL: Entertainment 2.0 in Europe
Sample base: 5,069 broadband HHs in Europe
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**Number of TV Shows Watched Using VoD Service (Q3/08)**

*Q317/317a. On average, how many television shows per month do you watch using VoD/Pay-Per-View services?*

(Among broadband HHs watching TV programs using VoD)

<table>
<thead>
<tr>
<th>Country</th>
<th>Median # of TV Shows Watched Using VoD Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.K.</td>
<td>5.0</td>
</tr>
<tr>
<td>Italy</td>
<td>3.0</td>
</tr>
<tr>
<td>Spain</td>
<td>4.0</td>
</tr>
<tr>
<td>Germany</td>
<td>3.0</td>
</tr>
<tr>
<td>France</td>
<td>3.0</td>
</tr>
</tbody>
</table>

Source: GDL: Entertainment 2.0 in Europe
Sample base: 5,069 broadband HHs in Europe
© 2008 Parks Associates
The Connected Life is about moving video services to the PC and mobile, voice services to the TV and mobile, etc.

<table>
<thead>
<tr>
<th></th>
<th>Video Services</th>
<th>Data/web-based Services</th>
<th>Voice-based Services</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TV</strong></td>
<td>Video on-demand</td>
<td>Personalized Content on your TV</td>
<td>Caller ID on TV</td>
</tr>
<tr>
<td></td>
<td>PVR</td>
<td>Internet Video</td>
<td>Unified Communications on your TV</td>
</tr>
<tr>
<td></td>
<td>Enhanced navigation</td>
<td>Music on Demand</td>
<td>Synchronized with cell and PC</td>
</tr>
<tr>
<td></td>
<td>Integrated search across storage media</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mobile Phone</strong></td>
<td>Control recording on PVR</td>
<td>Control what to get on cell phone</td>
<td>Unified Communications on your cell</td>
</tr>
<tr>
<td></td>
<td>Receive video clips from your PVR</td>
<td>Personalized content on your cell phone</td>
<td>Receive voice messages fwd by PVR</td>
</tr>
<tr>
<td></td>
<td>Send photos or video clips to PVRs</td>
<td>Your music and photos on your cell phone</td>
<td>Synchronized with PVR and PC</td>
</tr>
<tr>
<td><strong>PCs</strong></td>
<td>Manage content on PVR</td>
<td>Manage service preferences at home or at office</td>
<td>Unified Communications on your PC</td>
</tr>
<tr>
<td></td>
<td>Video to PC</td>
<td></td>
<td>Synchronized with cell and PVR</td>
</tr>
<tr>
<td></td>
<td>Integrated services portal</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
As channel line ups grew, so did ARPU

Baseline Revenue per Cable Subscriber / Month

Source: Kagan Cable Financial Factbook, Kagan Cable Futurecast
Note: Data for 2006 are Kagan projections
Service integration will take the bundle from “pay less get more” to “buy more get more”

a.k.a. The Connected Life