Introduction: The TV Is Not Enough

Consumers are increasingly interested in viewing video on a range of devices, both at home and on the road. According to Heavy Reading’s exclusive survey of 528 online U.S. consumers, they are interested in a number of multiscreen scenarios for their pay TV services (see Figure 1).

The key drivers for this trend are the proliferation of innovative digital devices; the growing awareness and popularity of Internet video services worldwide (e.g., Hulu, Netflix, BBC iPlayer, etc.); the licensing of high-value, professionally produced video titles for such services; and improved video delivery allowing for a vastly superior viewing experience via the Internet.

As various providers start to migrate into the multiscreen world, pay TV operators face a very real threat to their revenues. If they move too slowly into the multiscreen video arena, they could face competition from broadcasters, producers and other content rights holders going direct to consumers. In addition, Internet heavyweights such as Google, Amazon, Apple, etc. are increasingly targeting this space, and a new breed of online distributors such as Netflix are rapidly emerging to take on the role of aggregator for the next generation of video entertainment.

Service providers have recognized this trend and have deployed, or are in the process of deploying, their own multiscreen video services. Heavy Reading’s proprietary survey of 93 service providers worldwide found that more than 40 percent had already deployed multiscreen services (see Figure 2), with another 22 percent in the process of launching them.
Can Operators Charge for Multiscreen?

Multiscreen on-demand video is likely to add to subscriber satisfaction and loyalty, and reduce churn. It may also help upgrade subscribers to sign up for premium tiers of service. While direct causality is always difficult to prove in such matters, many operators around the world are rolling out such services, so clearly they are convinced there is a significant benefit to them.

But while consumer demand for multiscreen services is generally recognized, service providers have been struggling to define a business model for such services. Many providers are offering their services at no additional charge to existing pay TV subscribers.

For example, Spanish operator Prisa TV’s Yomvi multiscreen service was launched in October 2012, and its iOS app was downloaded by 68,751 users in the first three weeks alone, with the average user viewing 6.9 titles. Similar services in the U.S. (TV Everywhere from cable operators such as Comcast and Time Warner) and in other parts of the world have also typically generated fairly rapid adoption and usage.

Fewer operators are charging for such services, but consumers are attracted to the flexibility that online TV/movie providers offer, and are keen to have this functionality added to their pay TV service. In Heavy Reading’s consumer survey, more than 16 percent of respondents said they were very likely to pay an additional $10 per month to get video content delivered to various devices (Figure 3), and another 44 percent would consider paying. Certainly sites such as Netflix and Hulu have created a certain amount of brand equity, but the consumer’s willingness to pay this $10 per month is fundamentally for on-demand access to TV shows and movies via a variety of devices.
Some service providers are already charging for such services. Canal+, for example, offers its content free in Spain on Yomvi, but charges €9.99 per month for a package of movies and TV shows on its French multiscreen service, CanalPlay Infinity. Similarly, Sky's U.K. multiscreen service Now TV costs users £8.99 per month, and Central European broadcaster CME charges €7.40 per month for its Voyo service in the Czech Republic. The ability to levy an additional fee on existing subscribers is going to vary by market and will depend on each provider's individual situation and strategy, but operators are being able to levy a charge at least in some markets, for some content.

**Multiscreen's Killer App?**

For operators that find it difficult to charge a flat fee for multiscreen video, it may be worthwhile exploring specific use cases or types of content that would drive end-user willingness to pay. We believe the most difficult use case is going to be for paid multiscreen in-home viewing. Given that customers have access to pay TV content in their homes via the TV, convincing them to pay for such access on additional devices will not always be possible. Many customers are more likely to simply transfer viewing to the TV, or use their local DVR and VoD services to access time-shifted TV (TSTV) services.

There are only two scenarios where this is not possible: when the consumer is outdoors and does not have access to the TV; or when the consumer is out-of-market, and preferred programming is not available in that local market.

The first use case lends itself to mobile consumption, and this is growing rapidly. However, there are some fairly significant challenges remaining. One, the screen size of smartphones is not ideally suited to high-quality, long-form video. Instead short, low-engagement UGC-type video clips are better suited to mobile consumption, which is why YouTube is the single largest source of video traffic on mobile networks. Secondly, while mobile operators in some parts of the world have begun to deploy LTE, the video experience on most 3G mobile networks is still...
somewhat constrained by bandwidth and by usage caps. This space will develop quickly, since efforts are underway across the mobile value chain to expand capacity, optimize video delivery and improve mobile video QoE. The growing penetration of tablets and Wi-Fi hotspots is also adding momentum – but for now, there are some limitations.

That brings us to the second use case: the out-of-market video consumer. According to our survey of U.S. online consumers, 62.4 percent were “very” to “somewhat” interested in viewing shows from their pay TV service or DVR via a web-connected PC anywhere in the world (see Figure 4). Interest has remained largely consistent over the past year.

Figure 4: Consumers Are Interested in Global Access to Local TV Shows

Question: How interested would you be in the following capability from your pay TV provider: to view shows from your pay TV service or DVR via a Web-connected PC anywhere in the world?

<table>
<thead>
<tr>
<th>Year</th>
<th>Very Interested</th>
<th>Somewhat Interested</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>28.6%</td>
<td>35.6%</td>
</tr>
<tr>
<td>2012</td>
<td>26.3%</td>
<td>36.1%</td>
</tr>
</tbody>
</table>

Source: Heavy Reading, State of the Video Consumer, 2012; n=438

“On-the-road” consumers have no real option when wanting to view TV programming from their home TV markets, as in many cases that programming is simply unavailable. Important sports events, TV show premieres or finales are often highly valued experiences for viewers. And for reality shows where every episode results in an eviction, or shows with a sustained narrative where missing one episode literally means losing the plot, being able to see the show even away from home could be an important requirement.

Users are even more likely to use such services when travelling abroad. For business travelers in particular, stuck in a hotel room after a full day’s work, viewing unfamiliar programming in a foreign language may be the only other option. Convincing these relatively high-income professionals to pay a small transaction fee or subscription premium to access their favorite and familiar TV shows from a web-connected device should be a viable proposition.

As such, we believe a placeshifting/global DVR service is the most likely revenue-generating multiscreen service for service providers. Of course, additional benefits from targeted advertising, tiered services and the soft benefits gained from increased loyalty and lower churn can also be targeted.
Shift to the Cloud: The Pay TV Opportunity

There are different ways in which this kind of multiscreen placeshifting TSTV capability can be enabled.

Launched in 2005, Sling Media first enabled placeshifting. Its Slingbox was an in-home set-top box that connected to the DVR/cable set-top to access TV content and could "sling" it to a web-connected PC anywhere in the world. Sling Media was subsequently acquired by EchoStar and distributed by its satellite subsidiary, DISH Network. Other pay TV providers have since licensed the technology for distribution, and various models of Slingboxes are also available at electronics retailers in 20 countries.

However, this approach has its constraints. It requires users to remotely access the in-home set-top box rather than an optimized media server, has no built-in redundancy, relies on a relatively narrow upstream path and is constrained by the box's transcoding and other content optimization and delivery capabilities. All of these video preparation and delivery requirements can now be effectively managed via a cloud-based service.

In addition, moving this capability into the network and integrating it into a broader content delivery architecture could greatly improve service reliability and end-user QoE. Heavy Reading found that most service providers (83.9 percent) believe a robust content delivery network (CDN) is very to somewhat important for multiscreen video delivery.

Cloud-based TSTV also fits into a broader set of initiatives from operators to leverage the cloud. Operators are looking for ways to speed up activation of new services as Internet-based competitors increasingly threaten core operator strengths. Web-based providers can often launch new capabilities very quickly by leveraging standardized Internet tools and platforms, while operators typically have 18-month test and trial cycles. In fact, system-wide deployment may often occur years after the initial decision to evaluate a new service. Conversely, cloud-based services can often be upgraded and adapted more quickly, since the platform is housed on servers in comparatively central locations and is independent of the end-user's device. Often, it allows operators to use standards-based technologies which can further simplify development and deployment.

Lastly, some set-top box DVR technology vendors have an extensive suite of patents for device-based time-shifting, but these don't extend to cloud-based TSTV. As a result, some operators are reportedly exploring cloud-based TSTV as a way to develop new TSTV capabilities without stepping into patent controversies.

Additional Benefits of Cloud-Shifting

A cloud-based TSTV service could also offer service providers additional benefits:

Eliminate truck rolls: One of the most compelling benefits of a cloud solution is that it can be activated remotely without a truck roll. Nor is an expensive new set-top box required, which makes this approach both operationally easier and less
expensive to deploy. This has been the main driver for the deployment of network DVRs by operators such as Cablevision in the U.S. and KPN in the Netherlands.

**New tiering & promotion opportunities:** Pay TV operators could more easily create new tiered DVR services and drive incremental revenue. Multi-device access to the home DVR could be offered at a base price, with additional TSTV options at a premium. These could include options such as Catch-Up TV (allowing users to watch previously broadcast shows they had not recorded, subject to licensing approvals), Start Over (allowing users to restart a show when they miss the beginning), Follow Me services (switching mid-show to a different device and continuing to view the show seamlessly), etc.

Cloud-based TSTV also allows operators to offer free trials of new applications without the cost of deploying new set-top boxes. Premium channels such as Sky in the U.K. and HBO in the U.S. have had great success driving adoption of their services by offering free trials of their services for a fixed period. Users have an opportunity to try the service and discover its value, and the channel is then able to convert a percentage of users to paying customers at the end of the month. For example, Netflix built its business by regularly converting 10-15 percent of its free trial users to paying subscribers. In fact, at one stage in 2010, it was able to retain more than one in every four trial users.

**New “upstream” business model enablement:** Cloud-based video delivery services could also create a platform for entirely new service models aimed at content owners for high-quality, multiscreen delivery of their services. In addition, smaller operators that are keen to enter this space but have significant scale constraints could be potential customers. By partnering with larger operators, they could enable multiscreen for their subscribers.

And of course, there is the potential for new, innovative advertising formats, targeted ad delivery and replacing existing commercials with more timely promotions on time-shifted programming. Operators may be able to charge a premium for offering these capabilities to programmers and advertisers.

**Foundation for advanced experiences & services:** Cloud-based storage and delivery infrastructure can enable a range of additional services, such as worldwide home media sharing and access across devices, interaction with companion devices while viewing related content on the TV, support for remote security/monitoring solutions, video mail, cloud-based personal media storage, etc.

**Avoiding the Pitfalls: Key Challenges**

Operators also need to watch out for certain key issues when engineering a cloud-based time-shifting solution. These are discussed below:

**Legal position:** Legal and regulatory requirements vary with geography, with some countries allowing network DVRs, others (like the U.S.) allowing it with some conditions, and still others requiring permission from each content rights holder to enable such services. Operators need to be clear about what is legally permissible in their region before launching a cloud-based TSTV service.
Scale: The solution must be scalable, as demand can grow very sharply. Demand for individual titles as well as the service overall is unpredictable, but operators must be able to deliver a reliable, high-quality experience regardless.

Delivery control: Where content is licensed for time-shifting, it comes with an assortment of rules. Firstly, the content will usually need to be protected using an approved digital rights management (DRM) technology. Secondly, there will be restrictions on what content can be delivered to each approved device, where it may be stored, and for how long. Operators must be able to manage workflows and enforce required policy rules on a per-title basis.

Siloed content delivery architectures: Adding content delivery platforms for additional screens to legacy pay TV architectures will often create inefficient silos resulting from bolt-on solutions. In the long term operators will benefit from an integrated but modular approach to multiscreen, using an architecture that can flexibly support a wide variety of devices.

Diversity of formats: Delivering video to a wide variety of devices requires operators to cater to a wide variety of processors, screen sizes, resolutions, etc. But that’s not all – given the growth of Adaptive Bit Rate (ABR) streaming, there are multiple ABR streaming protocols and potentially varying video compression formats and DRMs among other variables that operators must be able to navigate.

The Right Approach: Keeping Your Head-Ends in the Cloud

The key concern for operators deploying a multiscreen TSTV solution is ensuring the scale to support a sizeable concurrent user base and the flexibility to manage video preparation and delivery across various networks, to various devices. The platform must be able to deliver a high-quality experience regardless of service, terminal device or network state. And it must do so in a cost-effective way that allows for a reasonable ROI.

Creating a converged platform for device, place and time-shifting in the cloud (cloud-shifting) allows for a centralized and more adaptable solution to enable multiscreen video preparation and management. Combined with edge caching, it can provide a high-quality experience for users across devices and networks.

Key components/capabilities of the solution must include:

Ingest flexibility: Video may be delivered in a variety of formats and via different networks (satellite, optical drive, fiber etc.) and operators may have to confront issues around legacy formats, especially for live feeds. Platforms must be compatible with typical inputs such as HD SDI and IP. Processing a high volume of live feeds could be another challenge, and navigating multiple storage protocols for on-demand services could be yet another concern.

Content management system (CMS): The CMS is the brain that manages the entire process of multiplex platform video distribution from ingest to delivery. It may also manage all control plane functions, session management, metadata insertion and video fragmentation/chunking, as well. In some cases, it may also be responsible for enforcing policy-type requirements such as content expiry, geo-blocking, etc.
**Video preparation and packaging:** The effective preparation of video is critical for multiscreen distribution. ABR streaming is a key development in this space. Platforms must be capable of managing multiple ABR protocols across required codecs, formats, bit-rates, players and standards.

**Encryption:** In order to license high-value video content from TV networks and movie studios, multiscreen distributors must be able to reassure them about the security of their titles. This requires them to use an acceptable content protection mechanism or DRM technology. Different content owners and device/OS providers support different DRMs, so the solution must be able to support the key options that are prevalent in the market.

**Device registry:** The variety of devices that operators will have to support will require a detailed device registry/warehouse, with specific details on device capabilities and profiles. This capability will enable service providers to optimize feeds based on device screen sizes, processing power, presentation engines, etc., to ensure that the stream can be received and displayed with high quality on the device.

**Multiscreen, multi-network content delivery architecture:** Multiscreen video will require a robust delivery network, including streamers, storage and caching. Load balancing and intelligent routing capabilities will be important as traffic volume and variety increases. Operators also need to think about off-network delivery for online and mobile video so that their subscribers can access high-quality video even when they are not within the network footprint of their service provider. This could be one of the key benefits of signing up for a multiscreen video package. Off-net delivery may require partnerships with other CDNs, or a federated approach among multiple service providers.

**Player/custom app/user interface/EPG:** A consistent user interface that helps users search and navigate the options available to them is also important. Increasingly operators are downloading a custom app on various devices that integrates the media player, DRM and a user interface that is suitable for the device but is fairly consistent across devices. A "negative EPG" which allows users to go back in time to find shows they want to watch is another important concept for TSTV.

**Management and measurement:** Managing the user experience is particularly important for operators. Tracking usage, measuring QoS and having access to various key analytics will be important to manage and calibrate the service to maximize QoE. Detailed metrics will also be useful for developing advertising revenues if operators pursue that model.

**Ad insertion:** Operators are keen to generate revenue from multiscreen video, and while various models are being considered for charging consumers, advertising is also a key consideration. Multiscreen access allows for unprecedented consumer targeting, both in and out of the home. TSTV also allows for operators and content owners to update advertising or select commercials based on viewer profiles. As a result, advertising could be a useful source of incremental revenue for operators.
Summary/Conclusions

Multiscreen video distribution is fast becoming an important requirement for pay TV operators. Consumers are increasingly interested in receiving services across devices, and content owners and online aggregators are already targeting this opportunity. Pay TV providers that don't address this burgeoning demand could lose customers to OTT services. 76 percent of service providers in Heavy Reading's multiplatform video survey acknowledged that multiscreen would be an important requirement in coming years.

Revenue models for multiscreen services are not well defined yet. Subscribers of pay TV services are reluctant to pay more simply for access to the same shows across additional devices. Many operators are offering their multiscreen services at no additional cost to their existing subscribers. However, this does add to loyalty and reduces churn, though specific causality and impact is difficult to measure.

Still, some operators such as Canal+ in France and Sky in the U.K., are being able to charge for TV shows and movies delivered to additional screens. Heavy Reading research found that 16.4 percent of consumers would pay an additional $10 per month to add multiscreen TV/movie services to their pay TV package. We believe that ultimately willingness to pay an additional amount for multiscreen will depend on the service providers brand image, competitive services in the local market, the slickness of the service and the type of content as well as, of course, the price point for the service.

We also believe that the value of multiscreen is far greater for out-of-home scenarios, where using the traditional TV service is not an option. As such, a placeshifting service could offer the most compelling revenue-generating use case, since it is the one scenario where access to local TV content or DVR is not available. Heavy Reading found that 62.4 percent of U.S. online consumers were interested in viewing shows from their pay TV service or DVR via a web-connected PC anywhere in the world.

Recording and time-shifting content from the cloud is likely to offer cost advantages as well as flexibility, and simplify workflows. Coupled with an efficient CDN, operators can offer improved QoE, especially for out-of-home viewing. This may also help operators shift costs from capex to opex, and offer better investment protection as cloud architectures allow more upgrade flexibility.

Additional time-shifted features are also important for a cloud-based multiscreen service. Layering on enhanced capabilities such as Start Over, Catch-Up TV, Follow Me TV, etc., will add value to the end-user experience. These enhancements could also create new revenue-generating opportunities for operators.

However, local market regulatory and legal requirements will be important issues to contend with. Different regions have different rules for network-based time-shifting, and operators must be wary of infringing legal constraints on recording and distributing content. This will also influence the business case for each individual operator. Partnering with local broadcasters for such services and potentially sharing revenue could help lower barriers. Also, once a couple of major broadcasters agree to support the service, others may feel the need to join in for competitive reasons.