CONNECTED HOMES

Enabling Anytime, Anywhere Media
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1. Introduction

The Internet has become an integral part of our lives, bringing many obvious social and economic benefits. Many homes now have a staggering array of electronics operating independently with little “awareness” of each other. The principle idea behind the connected home is to enable these devices to “talk” to each other, allowing them to work in concert. For instance, a television in a connected home should be able to play content from a storage device or share content with tablets, laptops and smartphones. With the advent of next generation networking technologies such as 4G and IPv6, the connected home market is poised for dramatic growth.

There are many different examples of connected home services, such as home monitoring, home entertainment, home security, and energy management. In our previous paper on the connected home, we considered the holistic connected home opportunity across all of these applications. In this paper, we will focus on the media services opportunity and consider how the connected home will change the way media is consumed over an array of devices and platforms. We will also explore the unique business and technology strengths of communication service providers that will help them capitalize on this growing market opportunity.

2. The Current Home Entertainment Landscape

Due to the growing popularity of smart devices and availability of high-speed broadband, the media, entertainment, and computing worlds are converging. The combined influence of smart devices, social networks, and user-generated content has made online video one of the fastest growing entertainment categories. However, the most popular form of media, by far, is still advertiser supported broadcast television (Figure 1).

<table>
<thead>
<tr>
<th></th>
<th>Q1’12</th>
<th>Q4’11</th>
<th>Q1’11</th>
<th>% Diff Yr to Yr</th>
<th>Hrs:Min Diff Yr to Yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>On Traditional TV</td>
<td>155:46</td>
<td>153:19</td>
<td>158:47</td>
<td>-1.9%</td>
<td>-3:01</td>
</tr>
<tr>
<td>Watching Timeshifted TV</td>
<td>12:09</td>
<td>11:44</td>
<td>10:46</td>
<td>12.8%</td>
<td>1:23</td>
</tr>
<tr>
<td>(all TV homes)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Watching Timeshifted TV</td>
<td>26:24</td>
<td>26:10</td>
<td>26:14</td>
<td>0.6%</td>
<td>0:10</td>
</tr>
<tr>
<td>(only in homes with DVRs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Using the Internet on a</td>
<td>30:05</td>
<td>28:55</td>
<td>25:33</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>Computer*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Watching Video on</td>
<td>5:24</td>
<td>5:15</td>
<td>4:33</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>Internet*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mobile Subscribers</td>
<td>5:01</td>
<td>4:54</td>
<td>4:50</td>
<td>3.8%</td>
<td>0:11</td>
</tr>
<tr>
<td>Watching Video on a</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mobile Phone^</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 1: Monthly time spent in hours per user on each medium, in the US. Source: Nielsen

Broadcast service providers increasingly offer interactive services such as Video on Demand with trick mode capabilities such pause, record and rewind, but often, these services require dedicated infrastructure that can be expensive and work only with a specific set of devices.

For example, in order to view the same content on devices other than a television, consumers need to either subscribe to a service such as TV Anywhere or purchase an additional device such as a Slingbox.
3. The Connected Home Entertainment Opportunity

Although the connected home entertainment opportunity is in the early stages, the potential for growth is enormous. According to analyst firm Juniper Research, connected home service revenues are forecast to grow from $20 billion (USD) in 2012 to $60 billion (USD) in 2017. This growth will be driven primarily by the home entertainment segment which is expected to account for 82% of connected home service revenues in 2017.

3.2 Seamless Experience: Session mobility and the seamless transfer of viewing sessions across devices will be another key facet of connected home entertainment services. Consider that a user watching the news over breakfast at home on a large screen television will be able to seamlessly transfer the news bulletin to a mobile device while stepping out of home. Once at the workplace, the user will be able to transfer the session to a laptop just as smoothly. Similarly, while watching a video clip on a mobile device, a user will be able to transfer the session to the television, and the viewing experience will continue uninterrupted.

3.3 Personalized Services: Connected home entertainment will enable video streams to be specifically tailored to particular device’s capabilities or consumer’s needs. This will facilitate the delivery of targeted advertising based on device type, screen size, resolution, usage trends, or location. A connected media service will also enable the integration of multiple services targeted by user type, to a single platform. For example, a user can be provided with links to advertisements embedded in television programs. These links can lead the user to an online retail store. The user may also be able to transact online directly via television, adding a new level of convenience and interactivity to content.

Some of these services are beginning to emerge and a few service providers are taking the lead in offering companion devices as well as single subscription linked multi-screen experiences. However, multiple challenges need to be addressed before such services become mainstream.

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4. Challenges in Implementing Connected Media

While the components of technology necessary for a connected media experience are available, connecting them to provide a seamless user experience requires resolution of certain challenges.

4.1 Rights Management: The availability of content anywhere and on any device makes conditional access and Digital Rights Management (DRM) even more critical. Content rights owners want to control when and where their content is accessed and on what terms. This includes not only video and audio content, but also books and other forms of media. From a commercial perspective, content rights owners are becoming increasingly inflexible regarding the licensing of content so that even where it is technically feasible to deliver content to a particular device, service providers may still not be able to do so due to licensing constraints.

4.2 Fragmented Device Landscape: The device landscape including televisions, smartphones, game consoles, laptops, and other smart devices has evolved rapidly over the last few years to develop capabilities for streaming high quality media and browsing the internet. For example, connected televisions and peripheral devices can now access Over-the-Top (OTT) content from the Internet and gaming consoles have browsing and media capabilities. However, interoperability between these devices
remains a challenge. Most of these devices are incapable of communicating with each other, especially when manufactured by different OEMs or running different software platforms.

4.3 Lack of Unified Standards: Lack of standardization across device hardware, software, and communication protocols is another major barrier to offering connected media services. Standards are crucial for device communication and transfer and continuation of media streams across devices.

4.4 Privacy and Security Concerns: While targeted advertising is still in its infancy, customer advocacy groups are raising concerns of potential privacy breaches. Targeted advertising could support the financial model for the multi-device and connected media landscape, but at the same time, it has the potential to become a pandemic menace much like spam emails. Customers are skeptical that data relating to their choices, location, and media consumption patterns may be misused by service providers or sold to business houses. In addition, as all devices will be connected to the network, the lack of unified security standards also raises data security concerns.

5. Recommendations

An all-IP environment in the home can allow for remote device access. It also enables any programming or content to be made available from anywhere, as if the user were at home. Service providers are uniquely positioned to leverage this opportunity and thus, they should focus their business strategy and marketing messages on the proposition of serving consumer demand for anytime, anywhere, any device media.

5.1 Focus on Service Delivery: Service providers have access to consumer homes via gateways and device connectivity. They can leverage this advantage by focusing on offering media services rather than purchasing media rights. Subscribers can negotiate and buy media rights directly from content owners while service providers can help consumers choose devices and stream the desired media to these devices as required. Service providers should focus on building this capability into their Service Delivery Platform so that users can create their own bundles of devices and media types. This mechanism will also help service providers circumvent the security challenges perceived by content owners and the resulting DRM issues.

5.2 Create Robust Networks: In order to navigate the interoperability challenges of media sharing across diverse device types, service providers should invest in building robust networks based on standard communication protocols. As in a hub and spoke architecture, diverse devices will communicate with the home gateway that will act as the single interface between service providers and consumer homes. Standardized in-home networks will allow service providers to access and distribute media services across devices via home gateways and also enable device to device sharing and interactions. In addition to standardized in-home networks, service providers should also invest on robust WAN and backbone networks to support the delivery of high-bandwidth media services.

5.3 Respect Consumer Privacy: Service providers need to pay special attention to the privacy needs of subscribers and must refrain from distributing unsolicited advertisements. Targeted advertisements that can be delivered to customers on-demand with some type of reward model provide a better mechanism for addressing privacy concerns.

6. Conclusion

The ability to seamlessly connect and integrate devices requires the use of a single unified network as the core communications layer. The secure two-way communication provided by IP enables voice, video and other data to be transferred between devices and service providers easily. Hence, creating fast, all-IP networks is the first step towards achieving a seamless connected home entertainment experience. In the near-term future, anytime, anywhere and any device media will be a reality, enabling seamless session transfers, media sharing flexibility and mobility that consumers desire. Telecommunication service providers are uniquely positioned to capture revenue from this high growth market opportunity.
References / Citations

1. Source: Nielsen, The Cross-Platform Report, Q1, 2012-US. This table is based on total users of each medium. TV viewing patterns in the US tend to be seasonal, with usage patterns different in winter months than summer months-sometimes leading to declines/increases in quarter to quarter usage.

2. The Connected Home Entertainment opportunity has been derived using two models – one subscription based and the other pay-per-view based. The total service revenue for the Smart Home Entertainment segment is forecast to reach almost over $48 billion (USD) in 2017, overwhelmingly driven by the subscription model. Source: Smart Home Ecosystem Connected Devices, Service Models and Revenues, 2012-2017, Juniper Research
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Winning in a Digital World

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