



HDMI[®] Stick

Putting the Everywhere in TV Everywhere

Susan Crouse, Director of Product Management

White Paper | January 2015

Contents

Introduction	3
TV Everywhere	3
<i>Implementation</i>	3
HDMI® Stick	4
<i>Hardware Characteristics</i>	4
<i>Software Characteristics</i>	5
HDMI Stick Capabilities	5
<i>Content Support</i>	6
<i>Provider/Operator Support</i>	6
<i>Access Support</i>	7
HDMI Stick Futures	8
Conclusion	8
Sources	9
Contact us today	10

Introduction

Since its initial rollout in 2009 TV Everywhere has been evolving, offering more and increasingly-varied content, supporting greater numbers and types of delivery devices, and providing more-easily-navigated access paths for consumers. New delivery devices such as the HDMI[®] Stick technology are motivating further TV Everywhere improvements on all three fronts: content, delivery and access.

TV Everywhere

The TV Everywhere business model was introduced commercially in 2009¹, and for many providers has augmented or even superseded Triple Play as their dominant business approach. TV Everywhere empowers PayTV subscribers to use their credentials to view content, formerly accessible only through hardwired televisions in the home, on laptops, tablets and smart phones over wired and wireless networks via QAM and IP delivery. The model has caught on worldwide and is especially popular in Western Europe².

Implementation

The typical approach to TV Everywhere is for the operator to provide an app that runs on, say, a tablet which then enables the viewer to watch already-subscribed content wherever that tablet can get network access.

The operator's ideal is to support a portable, intelligent device that provides the compute-power to ingest streams from a variety of networks, maintain authentication and viewing history tie-ins to the viewer's cable or satellite account, and deliver a high-quality video image on screens outside the account geography which are not restricted to viewing the content on a tablet screen.

Enter the HDMI[®] stick, or 'dongle', a pocket-size device on the physical scale of a USB memory stick capable of interacting with any device sporting an HDMI input.

HDMI® Stick

An HDMI stick is a portable device with a form factor resembling a USB thumb drive. Inside the device are hardware and software components that:

- connect via WiFi
- decode input streams
- output streams to screens
- provide storage
- perform decryption
- handle content protection and rights management

The last two years have seen a plethora of HDMI sticks enter the market, sometimes as general-purpose computers but often as specialized video viewing devices, including offerings from Google, Roku, and others.

HDMI Stick technology presents an opportunity for operators to extend mobile services to large screens. Small size and standard plug-and-play footprint allow users to carry the device in their pocket for a truly portable experience.

Hardware Characteristics

Externally, most HDMI sticks require a few extra accoutrements not found with USB drives:

- Remote control - Some HDMI sticks come with dedicated remote controls, others interact with the user's smart phone or tablet. Various means of communication have been explored, including IR, Bluetooth, WiFi, and RF.
- Access to power - TVs with HDMI 1.4 inputs can provide power, however current sticks draw more power than available through using this method, so sticks need USB power. There is a USB port provided on most TVs, but again the amount of power available via a USB port in the TV is most often not enough to power existing HDMI. Newer generation HDMI sticks consume less power, and newer generation TVs will provide better HDMI sourced power. In the meantime, many HDMI sticks rely on a wall adapter for full power.

Software Characteristics

HDMI sticks configured to receive and render video host many of the same software components normally associated with set-top boxes (STBs), such as an operating system (Linux, for example), connectivity tools such as WiFi and Bluetooth, application frameworks such as RDK or Android, authentication utilities, and user-facing applications.

While it's tempting to think of it as a kind of micro STB, this image can be limiting. In fact, the HDMI stick is a new class of device which can in many ways emulate the functions of a STB, but also has its own unique capabilities, not the least of which is the ability to accept content not just from a gateway in the household but directly from the cloud.

HDMI Stick Capabilities

Popular HDMI stick devices include Amazon Fire TV Stick, Google Chromecast, and Roku®. "White label" HDMI sticks are available from wholesale suppliers which can be loaded and labeled to be offered under PayTV provider branding. As the first generation of HDMI sticks has been deployed, their attractions have also been revealed:

- Portability - Because an HDMI stick is small and can be plugged into any HDMI-compatible TV, viewers can take the HDMI stick wherever they go, as long as if the provider has the rights to provide content in that location over that connection.
- Onboard storage - Even without full content rights, providers can often support a download-and-go service, so, for example, a viewer can download a yoga workout or a movie, then when traveling take the HDMI stick to a hotel and view the video. This can even be coordinated with the in-home viewing history, so the viewer can watch the first hour of a movie at home, then download the content and resume viewing in another location, or they can have their workout in hand everywhere they go.
- Price - As HDMI sticks have become more widespread, their cost has dropped into an easily-affordable range. When their price is similar to or lower than the least expensive STBs, operators see a viable product to add to their ecosystem. With HDMI sticks, operators and content owners can generate revenues through subscriptions or purchase of content and applications. This allows them to reconsider their hardware delivery model. As the

technology continues to improve, devices could be replaced every two years with a speedier device, a cell phone-like model to cable providers for attracting new business. One can even envision providers sending HDMI sticks to prospects with an initial limited activation as an enticement to subscribe to full service (the early 'AOL model').

An HDMI stick could be preloaded with an app that is compatible only with the PayTV service who provides it. This would be described as a "closed environment." An HDMI stick could also be loaded with other apps that enable access to other content providers, possibly not connected with the viewer's PayTV subscription. In such an "open environment," the other apps would likely carry their own unique DRM schemes, which could differ from that of the PayTV-subscribed app. This is known today as a multi-DRM solution. Sticks often support multiple DRM software solutions accommodating a variety of content. When this type of access is provided on a stick, the user typically registers a separate subscription to such services in order to gain access.

Operators could consider a retail model with HDMI where the stick is preloaded with their portal and any others they decide to license side-by-side.

Content Support

TV Everywhere's content offerings have progressed from VOD to include premium content and live TV². Live sporting events, always popular with the viewers, have been particularly instrumental in driving innovations such as coordinated multi-screening and auto-authorization. An HDMI stick preloaded with appropriate apps can provide portable access to worldwide sporting events with a single sign-on. In markets that support such capabilities, an HDMI stick application can offer STB-like support for enhanced viewing capabilities such as live pause and rewind.

Provider/Operator Support

TV Everywhere has kept pace with the PayTV arena at large, where the number of mobile screen views rivals the number of TV views. In the favorable European market, it is estimated by one source that mobile screen usage will catch up to TV views in the upcoming year:

"[In Europe] almost half of all devices that receive TV services from the largest global pay TV service providers by 2015 will be PCs, smartphones, tablets and other multiscreen devices, according to *IHS Screen Digest*. It predicts that the top 43 global pay TV operators will supply TV services to 310 million active

multiscreen devices by 2015, compared with 322 million set-top boxes³."

For the operator, the goal is a viewing experience that is as consistent as possible across all supported devices, ideally allowing the viewer to switch screens seamlessly mid-program. To this end, a solution has emerged in the form of the mezzanine file, an intermediate format in which a video asset is distributed as a single intermediate file which can then be transcoded to suit a variety of delivery devices. In order to streamline distribution and delivery throughout the streaming video industry, CableLabs issued a Mezzanine Encoding Specification in late 2013⁴, and the Entertainment Merchants Association (EMA) issued a standard for mezzanine files in early 2014, favoring the H.264 codec⁵. By offering a variety of user agents and IP streaming support, a properly configured HDMI stick can offer viewers choices of form factors and resolutions to accommodate their selected output devices.

Access Support

Rights management is central to the TV Everywhere model. The subscriber who pays for access to content in the home over traditional STB/QAM channels expects TV Everywhere to deliver content to mobile devices over IP networks without additional cost or purchase transactions. Thus the ability to validate the user over these alternative access channels is a convenience to the user allowing them access to already-subscribed material at no additional cost. In order to be perceived as a desirable feature, this sign-on process must be as unintrusive as possible—certainly more convenient than executing a separate purchase with an OTT provider.

Content providers have different rules for accessing their content over the Internet away from the viewer's home and its delivery gateway.

Content accessibility obstacles are continually improving through business agreements and even relaxed regulatory restrictions. For example, the FCC recently dropped its local sports blackout rule⁶.

Technical advances have also contributed to more fluid registration procedures. For example, between the 2012 Summer Olympics and the 2014 Sochi Winter Olympics, Xfinity introduced auto-authorization capabilities so viewers did not have to keep re-entering credentials⁷.

HDMI sticks provide plenty of memory and computational cycles to support powerful encryption and content schemes, for secure content delivery in which authorization does not intrude on the viewing experience.

HDMI Stick Futures

The flexibility of the HDMI stick provides an abundance of opportunity for operators and content providers. Depending on the market, some operators are considering expanding their services by developing business relationships with other content catalogs; the HDMI stick lets the operator decide what offerings they want to expose to their subscribers. Combined with powerful software solutions, the ability to add and manage applications is also possible. Operators can strike deals with popular games and other apps, and they can also build their own applications for features such as simple information dashboards for weather, stocks and lottery.

Moving further into the future, the HDMI stick is a perfect complement to emerging Internet of Things (IoT) for applications such as energy management and household security. This allows operators to add applications for various services that can provide simple interactive monitoring on the TV. While the whole hardware ecosystem would integrate IoT services, the HDMI stick allows an ease of extending those services throughout the household.

Conclusion

HDMI[®] stick technology extends the reach of TV Everywhere in the key areas of content, delivery, and access. Operators can capitalize on the proliferation of first-generation HDMI technology, and have the option of developing their own TV Everywhere apps to be distributed on their own branded HDMI sticks. The HDMI stick offers an attractive, cost-effective addition to the array of mobile devices supporting the TV Everywhere experience for viewers around the world.

Sources

[1] Cheng, Jacqui, "Comcast expands online video to all cable+Internet customers", *ars technica*, <http://arstechnica.com/business/2009/12/comcast-expands-online-video-to-all-cableinternet-customers>, 15-Dec-2009.

[2] Jurkevic, Julija, State of global TV Everywhere, SNL Kagan Global Multichannel, <https://www.snl.com/interactivex/article.aspx?id=27682125&KPLT=6>, April 8, 2014.

[3] Graham Pomphrey, Multiscreen for the masses - assessing TV Everywhere in Europe, DigitalTVEurope.net, <http://www.digitaltveurope.net/28284/multiscreen-for-the-masses/>, September 17, 2012.

[4] OpenCable™ Specifications, Mezzanine Encoding Specification, OC-SP-MEZZANINE-I01-131021, CableLabs, October 21, 2013.

[5] Entertainment Merchants Association, *EMA Mezzanine File Creation Specification and Best Practices*, Version 1.0.1 for Digital Audio-Visual Distribution, http://www.entmerch.org/digitalema/committeescouncils/mezz_010714.pdf, January 7, 2014.

[6] "FCC Eliminates Sports Blackout Rules", *Press Release*, Federal Communications Commission, <http://www.fcc.gov/document/fcc-eliminates-sports-blackout-rules>, 30-Sep-2014.

[7] Sochi 2014: A TV Everywhere Success Story, Comcast, <http://corporate.comcast.com/news-information/news-feed/sochi-2014-a-tv-everywhere-success-story>, March 7, 2014.

Contact us today

For more information
please contact one of our regional offices or
visit www.alticast.com
or email info@alticast.com

Alticast Corporation
Seoul, South Korea
Tel +82 2 2007 7827
info@alticast.com

Alticast Inc.
Colorado, USA
Tel +1 720 887 1700
us@alticast.com

Alticast B.V.
Amsterdam, Netherlands
Tel +31 20 240 3190
eu@alticast.com

Alticast Poland
Wroclaw, Poland
Tel +48 (71) 337 24 77
eu@alticast.com

HDMI, the HDMI logo, and High-Definition Multimedia Interface are trademarks or registered trademarks of HDMI Licensing, LLC in the United States and/or other countries. All other trademarks and registered trademarks are the property of their respective owners in the United States and/or other countries.

This document is protected by copyright and distributed under licenses restricting its use, copying, and distribution. No part of this document may be reproduced in any form by any means without the express written permission of Alticast Corporation.

AltiProtect is a registered trademark of Alticast Corporation. All other trademarks are the property of their respective owners.

©2015 Alticast Corporation. All rights reserved. Printed in the USA.