

# DLNA® for Streaming Subscription TV Content in the Home



Digital Living Network Alliance®

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## **Introduction**

Consumers have grown accustomed to the capabilities enabled by DLNA Certified® home network products. These products provide a simple way to share personal video, photos and music throughout the home. Now, the same DLNA Guidelines that enabled these capabilities -- and that have been used to certify more than two billion products worldwide -- have been extended to allow consumers to view subscription TV content on a wide variety of devices including televisions, tablets, phones, Blu-ray players, set top boxes (STBs), personal computers (PCs) and game consoles without any additional intermediate devices from the service provider.

Consumer Electronics (CE) products that are certified to the VIDIPATH Guidelines can directly support the full range of subscriber HD programs, movies, DVR content, channel guides, and other premium features, all with a consistent user interface (UI) from their service provider.

VIDIPATH Guidelines offer benefits for users, device OEMs and service providers, while creating the opportunity for the industry to give consumers more content to view, on more devices. These benefits include:

- Consumers have more choices for enjoying the full subscription TV content-viewing experience on multiple devices in the home.
- CE manufacturers have a single standard that reduces product development and operator testing costs for building devices with the added value of providing end-users with access to service provider content.
- Service providers can deliver content to multiple subscriber owned devices with full quality, a consistent user experience and content protection, without having to install any additional equipment or manage multiple applications.

### **1 The Problem -- Why VIDIPATH is needed.**

According to the ABI Research, global pay TV subscribers will eclipse 1 billion by 2018, generating service revenue of US \$229.6 billion.<sup>[1]</sup>

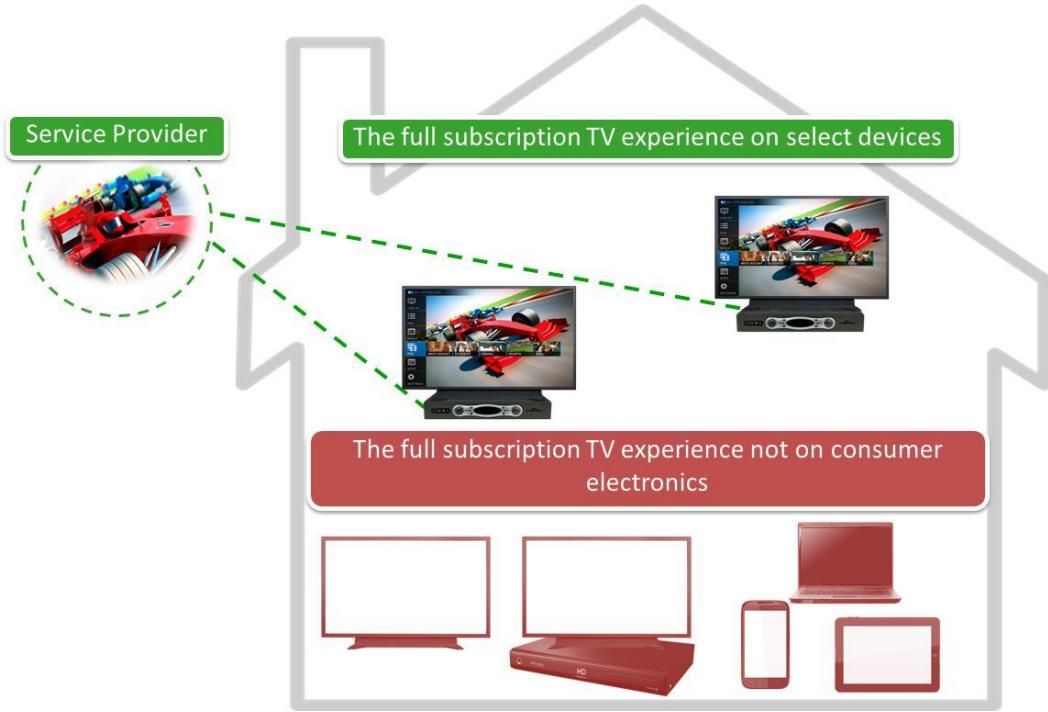
This rapidly growing base of consumers wants to enjoy the full subscription TV experience on multiple devices. Over the past several years, consumers have begun sampling a multi-device viewing experience by streaming content from Internet sources onto their personal devices. However, this can only be done in a piecemeal fashion, by downloading individual apps for each device, and then finding and accessing the desired content. Often, only a portion of traditional subscription TV content items is available from Internet sources.

Meanwhile, service providers also had the desire to give their customers a multi-device viewing experience, but they needed a solution that would not require them to deploy additional equipment in subscribers' homes, or to manage unique applications for each device platform (e.g. platforms running Android, Windows, and iOS operating systems).

To solve this problem, service providers began working with DLNA to develop an in-home content-streaming solution. The goal was to offer a full, high-quality subscription experience over the home network across televisions, tablets, phones, Blu-ray players, STBs, PCs and game consoles. VIDIPATH Guidelines are the result of this work, and were developed through a close collaboration between subscription TV service providers as well as members of the CE product development ecosystem.

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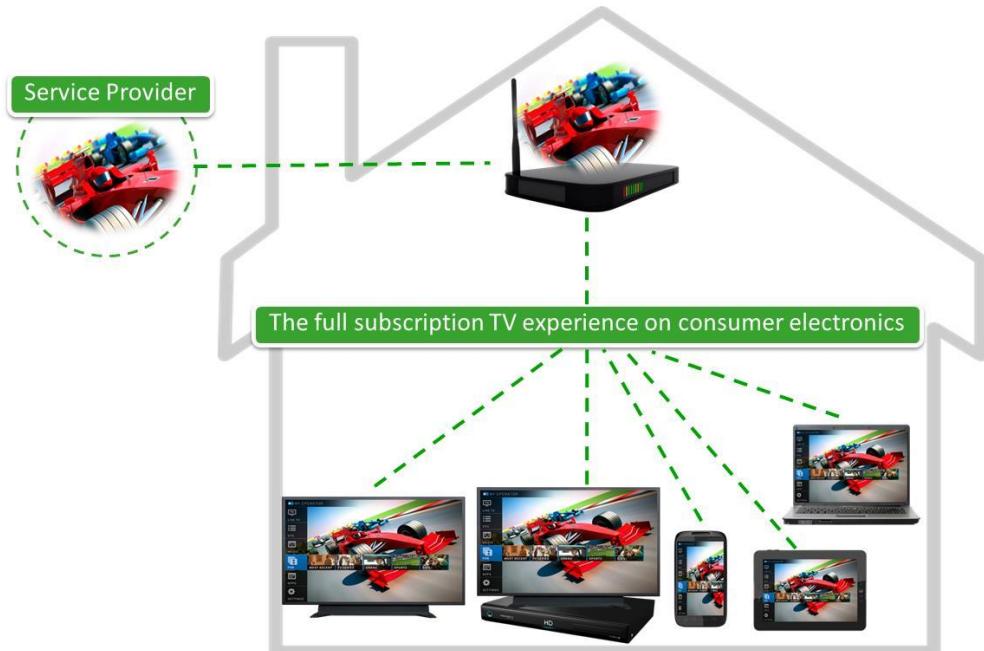
[1] ABI Research, "Worldwide pay-TV Subscriber Base Surpasses 886.5 Million in 3Q 2013 Thanks to BRIC Markets, ABI Research," Nov. 13, 2013



**Figure 1: Subscription TV experience today**

## 2 Solving the Problem -- Delivering subscription TV content through VIDIPATH

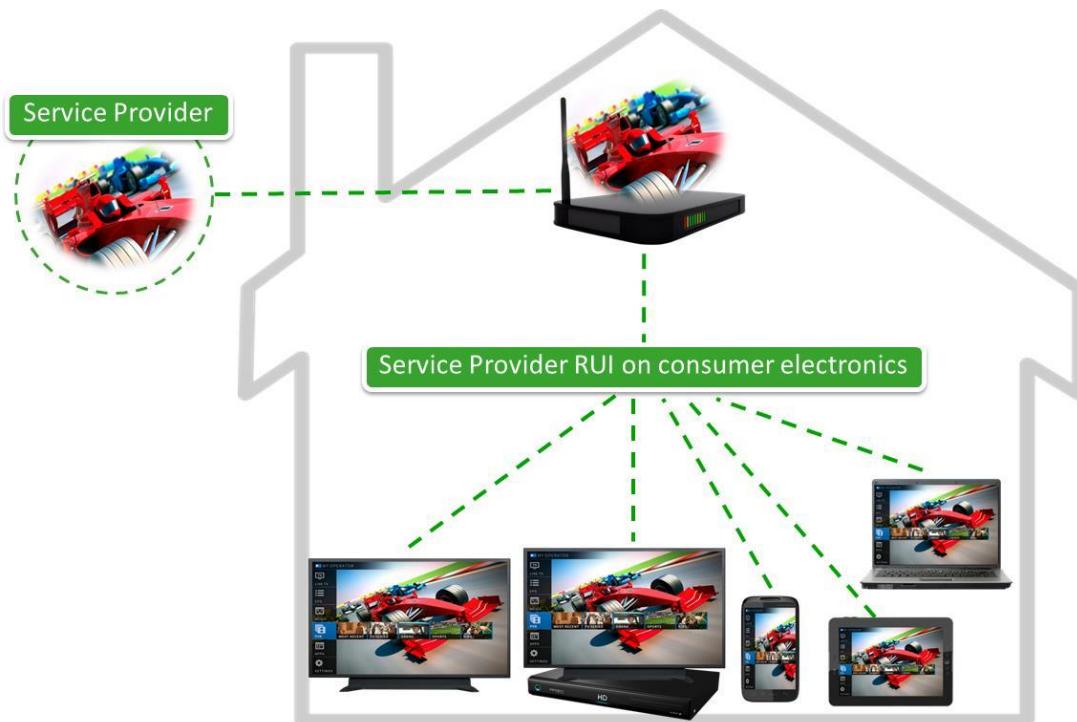
DLNA continues to redefine the boundaries of the connected home with the introduction of VIDIPATH Guidelines. VIDIPATH enables consumers to stream their favorite television programs and movies from their local service provider to products built to the VIDIPATH Guidelines such as televisions, tablets, phones, Blu-ray players, STBs, PCs and game consoles anywhere in the home.



**Figure 2: Subscription TV experience with VIDIPATH**

In order to deploy subscription TV services to CE devices in the home, service providers needed a mandatory set of features on those devices. The VIDIPATH specification describes this required set of features and offers the following solutions:

- Protected Streaming – Content needs to be protected from unauthorized copying and misuse within the home. This is a critical enabler for multi-device viewing experiences involving subscription content. The VIDIPATH Guidelines enable secure playback of this content across multiple devices by using Digital Transmission Content Protection over Internet Protocol (DTCP-IP) Link Layer protection technology. DTCP-IP is automatically negotiated between devices and has been designed to protect content as it moves across the local home network.
- Distributed User Experience – In response to the demand for a framework needed to deploy the same service provider user interface on all client devices, DLNA selected HTML5 – an international standard developed by WC3. HTML5 is a widely adopted technology in all common web browsers that allows operators to develop “write once, play anywhere” content applications across a broad range of browsers and platforms. HTML5 Remote User Interfaces (RUIs) enable the repurposing of a single code-base, resulting in reduced development costs, faster time to market for new services/applications and the provisioning of a unique user experience for every device type.

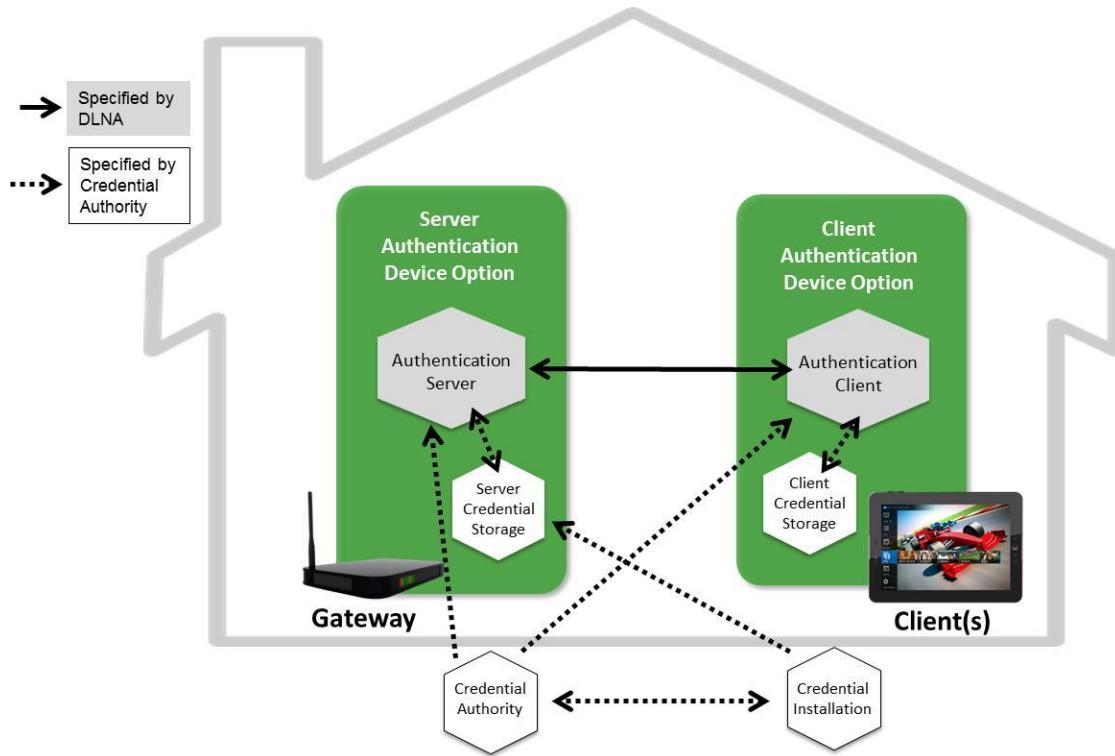


**Figure 3: HTML5 RUI**

- Sleep-Mode Support – A growing number of devices are required to meet tight energy consumptions regulations. To support these initiatives, VIDIPATH includes guidelines that provide wake-up or reservation mechanisms to devices. The guidelines provide a mechanism for DLNA devices to convey energy management and sleep-mode capabilities for each of its network interfaces. This technology is based on the UPnP Energy Management Service.
- Adaptive Delivery – To enable a smooth viewing experience, the VIDIPATH adaptive delivery capability dynamically adapts the live stream to the available bandwidth across the internet and in the home using MPEG-DASH technology. There is widespread adoption of MPEG-

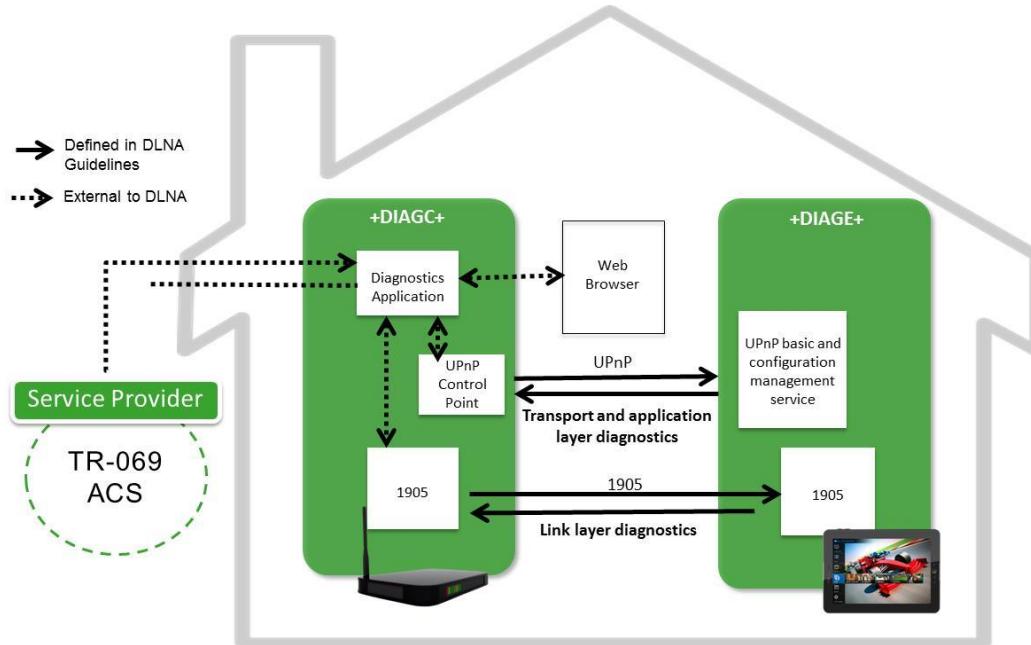
DASH because it is a stable independent international standard and content is increasingly distributed with it.

- Client Authentication – By utilizing the DLNA authentication guidelines, operators can verify that the client has been certified to the DLNA VIDIPATH Guidelines using DTLA DTCP-IP keys. Authenticated clients reduce technical support cost by prohibiting substandard products from attempting to receive services.



**Figure 4: Authentication**

- Client Diagnostics - To support service providers in their delivery of a positive user experience, the DLNA diagnostics guidelines allow service providers to identify and analyse device- and service-related issues on the home network. This enables service providers to offer advanced remote support for their users, which reduces in-home service calls. This mimics the ability that service providers already have on their access networks, which was previously unavailable on the home side of the gateway.



**Figure 5: Diagnostics**

The technologies in the VIDIPATH Guidelines enable service providers to deliver the full subscription experience on devices that are not delivered or managed by service providers. They also solve the problem of previous approaches that distribute valuable content over the home network using private conditional access technologies. These previous technologies require that each device have built-in technologies from different vendors. The VIDIPATH Guidelines simplify content sharing across CE devices on a local home network, and also ensure that the UI can be shared in a format understood by all VIDIPATH clients, so that operators can simplify the distribution and monetization of content by leveraging standardized applications and devices.

### 3 Benefits of VIDIPATH for Consumers, OEMs and Service Providers

As VIDIPATH capabilities are built into home network products, they will offer benefits for consumers, OEMs and service providers.

- **Consumers:** VIDIPATH will increase the number of consumer choices for enjoying seamless subscription TV content viewing on multiple devices in the home. With VIDIPATH on smart TVs, end-users will benefit from the availability of their favorite HD channels, movies and features such as DVR on every screen, without the need for additional service provider equipment. VIDIPATH's automatic service discovery simplifies installation while providing the same service provider UI for navigation, which is of high value to the end-user. VIDIPATH will also offer benefits for mobile device users, who will be able to access a service provider UI that is tailored for a smaller factor but retains a familiar look and feel. Extending service to

mobile devices inside the home greatly benefits the end-user, who can now enjoy subscription TV content without having to download proprietary service provider applications or one of the many competitive broadcast or over-the-top (OTT) applications. Viewing content on a mobile device built to the VIDIPATH Guidelines will also offer higher-definition content quality as compared to OTT services, and will permit the end-user to benefit from the latest HD-or-higher screen quality that is available on many of today's tablets and smartphones. These benefits, and others for platforms including game consoles, PCs and other devices, will improve the user experience.

- **CE Manufacturers:** Smart TVs provide access to a variety of video sources, and some TV manufacturers have launched their own transactional premium subscription content services to support their devices. For TV OEMs, VIDIPATH will greatly reduce the need to develop and maintain an application for each service provider, while offering a user experience similar to the one offered on their STB. Mobile device OEMs will benefit from adding built-in capabilities for accessing subscription TV content inside their native media players, providing a one-stop location for all their multimedia experiences. Another benefit for mobile OEMs will be the ability to cut product development and operator testing costs by providing a single standard for building devices that deliver access to service provider content. Manufacturers of other devices including PCs and game consoles will also benefit from the added value of offering VIDIPATH functionality in their products.
- **Service Providers:** All of the aforementioned benefits are also valuable to service providers, whose goal is to enable more consumers to view subscription TV content on more devices, while maintaining the full subscriber experience and UI. The guidelines enable service providers to offer a multi-device experience without having to deliver and install any new equipment or manage multiple applications, while also preserving the rights of content providers through authentication and protected streaming in the home. Plus, the inclusion of adaptive streaming technology and remote diagnostics makes it easier for providers to optimize the subscriber experience. VIDIPATH will enable service providers to:
  - Deliver headless gateways, which will minimize their capital expenditures by eliminating the need for a headed gateway and an additional STB per screen;
  - Deliver a high quality of service (QoS) and UI by relying on the in-home infrastructure, which is a critical differentiator for service providers as they compete with alternative OTT services;
  - Capitalize on the industry effort that has been expended to move the UI to HTML5, which speeds up time-to-market for new services and makes it easy for service providers to move their UI to additional devices;
  - Re-direct Internet bandwidth previously used for live broadcast TV services to Video on Demand (VOD) and other critical services, since providers can now support multi-device viewing on the broadcast network;
  - Simplify end-user support on retail devices using VIDIPATH diagnostics capabilities;
  - Meet stringent power requirements for service gateways by taking advantage of VIDIPATH's low-power capabilities;
  - Mix local in-home and Internet content with adaptive streaming or standard transport, transparent to the end-user.

## Conclusion

Demand for subscription TV services is growing worldwide. At the same time, consumers increasingly want a seamless and unified experience for viewing all of their subscription TV content on multiple devices in their homes. Subscription TV providers recognized this opportunity and are utilizing VIDIPATH as a standardized approach to bring content and services to CE devices. Consumers who purchase devices certified to the VIDIPATH Guidelines can be

confident that these devices will support the full range of subscriber features, security, seamless integration, and consistent UI capabilities in the home.