Standards-centric Revenue Security for Multi-screen OTT Video

VCAS™ for Internet TV
Proliferation of Internet TV and mobile video access presents both threats and opportunities, pushing pay-TV operators to improve service offerings and operations to meet rapidly rising subscriber expectations.

One major challenge is to extend the pay-TV service brand and subscriber relationships beyond the living room, indeed beyond the home, to satisfy demands for personalized choices and flexible viewing models. This has impact on service delivery technology and business models.

Thus, how to optimally monetize valuable content and services across a multi-network, multi-screen environment becomes the key challenge for both traditional and new operators.

A major hurdle is how to ensure quality of service (QoS) beyond the managed network. Video delivery over the Internet and via mobile networks presents unique QoS issues. The challenges of Internet TV and over-the-top (OTT) delivery can be overcome by utilizing the right technology and tools, thus providing a TV experience worth paying for.

**Video Content Authority System (VCAS™) for Internet TV**

**Revenue Security for Over-the-Top Pay-TV**

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<th>Challenges</th>
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<td>VCAS for Internet TV, powered by the multi-network VCAS platform, provides a complete digital TV security solution for OTT services over networks implementing the HTTP Live Streaming (HLS) protocol. The protocol optimizes the video quality for any given last-mile bandwidth and screen resolution.</td>
<td>VCAS for Internet TV secures and enhances the revenue of OTT services as follows:</td>
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<td>VCAS for Internet TV secures OTT services to multiple screens and across multiple networks, including both live (broadcast) and video-on-demand content delivery.</td>
<td>- ViewRight® Web clients turn connected devices into fully functional TV clients: iPhones &amp; iPads, smart TV/STBs, PCs &amp; Macs and Android™-based devices.</td>
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<td>VCAS for Internet TV enhances the basic HLS security model with capabilities that support subscription and transaction based pay-TV services. In particular, VCAS ensures that decryption keys are kept safe and distributed to authorized clients only.</td>
<td>- Standards-based, two-way Internet security protocols ensure a solid foundation.</td>
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<td>The software-based solution is built on proven cryptographic and secure electronic transaction concepts used in e-commerce applications, providing the same high level of digital TV security that Verimatrix is recognized for in 500+ IPTV deployments.</td>
<td>- A Public Key Infrastructure (PKI) public private key pair system plus X.509 digital certificates, featuring VCAS key management methods already proven in large IPTV deployments globally.</td>
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<td>- Strong encryption using the robust AES-128 algorithm.</td>
<td>- Downloadable, renewable security for OTT clients, which can be updated on-the-fly to combat security threats.</td>
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<td>- Downloadable, renewable security for OTT clients, which can be updated on-the-fly to combat security threats.</td>
<td>- StreamMark® server-based forensic watermarking, with a unique and highly robust user identifier that is traceable to the last authorized recipient.</td>
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**HTTP Live Streaming**

HLS, a form of HTTP adaptive rate streaming, is ideally suited to challenges of mobile and Internet TV:

- Open standard allowing tight integration of the technology into VCAS head-end and client devices.
- Use of H.264 codecs and MPEG-2 Transport Stream format, thus enabling straightforward integration into existing digital TV head-ends.
- Adaptation to variable bandwidth and various display resolutions to ensure optimized user experience.
- Highly scalable, with multiple network support – broadband, 3G/4G wireless, Wi-Fi, etc.

The defined HTTP Live Streaming protocol incorporates a baseline link-layer security model for services. The tight integration with VCAS includes important extensions to the standard model that improve the capability to support subscription and transaction based pay-TV services. In particular, VCAS for Internet TV performs entitlement verification and ensures that decryption keys are managed and selectively distributed to authorized clients only.
VCAS for Internet TV – System Architecture and Key Components

• **Operator Management Interface (OMI)** – The core administrative component of VCAS, OMI provides a single VCAS integration point for customer care, billing and middleware systems through a set of content, device and entitlement management interfaces. OMI enables VCAS domain-based business models for multi-screen digital TV services by providing homogenous subscriber and rights management for heterogeneous networks and devices: DVB, IPTV, Internet TV/OTT, and hybrid combinations thereof.

• **Adaptive Content Security Manager (ACSM)** – ACSM contains the VCAS for Internet TV security components for networks implementing HLS, including OTT services. ACSM supports authentication, key distribution and user control and acts as the root Certificate Authority in a PKI hierarchy.

• **MultiCAS™/Adaptive** – MultiCAS/Adaptive integrates high-performance third-party AES scramblers with proven Verimatrix software-based content security. Content encryption keys are generated either by ACSM or the HLS encoder/scrambler and exchanged via the MultiCAS interface. The encoder then undertakes the AES scrambling of the streaming video chunks.

• **ViewRight® Web** – The Verimatrix ViewRight Web client is a robust package of portable code that implements the VCAS for Internet TV device authentication functions in clients enabled for HLS. ViewRight Web clients provide cross-platform support for secure Internet TV/OTT content delivery to a variety of device categories, including iPhones/iPads, PC/Macs, Android-based smart phones and tablets, STBs and connected/smart TVs, etc.

• **StreamMark® (not shown)** – StreamMark, a patent pending Verimatrix revenue protection innovation, is a user-specific forensic watermarking technology that uses a highly efficient server-side embedding process to uniquely mark compressed content files during delivery, even when these content files already are encrypted. Mass delivery of uniquely marked content offers a valuable tool to combat revenue leakage in the latest video consumption models, such as OTT delivery to standard CE devices.
Key Partnerships

The Verimatrix business strategy includes building and sustaining a network of strategic alliances with a broad range of the most significant pay-TV technology providers and CE manufacturers. These relationships, which emphasize seamless technology integration, ease of operation and extended value, enable Verimatrix to offer pre-integrated best-of-breed solutions to our customers and their users. The range of established partnerships is very wide and includes companies that offer products and services such as content aggregation, system integration, video processing, VOD servers, subscriber management and middleware systems, connected TVs and STBs, and mobile devices.

Specifically, VCAS for Internet TV is pre-integrated and tested with leading encoders and HLS segmenters from, among else, Ateme, Elemental, Envivio, Harmonic, RGB Networks, Telesete and Wowza, Apple’s QuickTime, and Android media players from Nexstreaming, NXP Software, Real Networks and VisualOn.

Verimatrix - Beyond Content Protection to Revenue Security

Verimatrix specializes in securing and enhancing revenue for multi-network, multi-screen digital TV services around the globe. The award-winning and independently audited Verimatrix Video Content Authority System (VCAS™) and ViewRight® solutions offer an innovative approach for cable, satellite, terrestrial, IPTV and OTT operators to cost-effectively extend their networks and enable new business models. As the established trend setter in cardless security solutions, the company has leveraged its innovative 3-Dimensional Security approach to provide a harmonized rights platform for premium content delivery to a range of devices over new hybrid network combinations. Maintaining close relationships with major studios, broadcasters, industry organizations, and featuring an unmatched partner ecosystem, enables Verimatrix to provide a unique perspective on digital TV business issues beyond content security as operators seek to deliver compelling new services.

- 3-Dimensional Security architecture for TV Everywhere applications
- Harmonized multi-network rights management across broadcast, streaming and file-based applications
- Market leading cardless security technology for broadcast and IP networks
- Enhanced HTTP Live Streaming (HLS) security
- Integrated MultiRights PlayReady License Server
- Cross-DRM device and domain entitlement management – VCAS Super Domains
- Verimatrix ViewRight ONE multi-network embedded security client libraries
- Layered security regimes with rapid response and renewability options
- Video watermarking solutions for user-specific forensic tracking
- Award-winning and independently audited telco grade technology
- Extensive partner ecosystem enhanced by rock solid integrations
- Most widely deployed system among tier 1 telecommunications operators globally

Verimatrix is an ISO 9001:2000 certified company