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SYSTEMS

Mobilizing 'TV Everywhere'

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The MSO Challenge

Competitive pressures from over-the-top (OTT) content delivery platforms and emerging service providers are unrelenting. Fueled by the proliferation of Internet-based content and the popularity of smartphones and large-screen tablets, consumers expect 'TV Everywhere' services on devices of all types. Large-screen HDTVs are no longer the sole viewing platform for premium subscription and TV programming, as OTT delivery mobilizes content. To compete, Multi-Service Operators (MSOs) must offer services across alternative viewing devices and make OTT delivery a competitive advantage.

While MSOs typically control high-bandwidth connections to the home, the FCC's net-neutrality ruling requires the sharing of mobile transport services with other service providers, including Application Service Providers (ASPs) that recognize the opportunity created by open broadband access and want to capitalize on direct relationships with broadband subscribers. Now MSOs must counter this competitive threat while increasing revenues and deterring consumer defection without incurring significant incremental cost. In order to expand their services to mobile devices, MSOs need simple, cross-platform solutions that utilize standards-based architectures and protocols that leverage their existing infrastructure investments and workflow procedures.

Without cross-platform solutions, extending services to 'third screen' devices powered by mobile operating systems can be challenging, simply because supporting them is far more complex than supporting the 'second screen' common to Internet-connected computers and laptops. Chief among the challenges are the large variety of mobile devices running various operating systems, a lack of unifying standards, and issues related to bandwidth variability and image resolution.

MSOs should not venture into this new paradigm without reservations. They need to:

- Fully monetize second- and third-screen offerings by replicating first-screen experience on other screens to offer more than just limited video-on-demand (VoD) services

- Preserve existing investments in content delivery, including video acquisition, transcoding, video storage, rights management, and service mediation

- Leverage existing workflows and minimize operational changes while extending mobile service capability

- Maintain brand and content quality under varying network conditions, device capabilities, and viewing screens

- Optimize network and variable bandwidth management to maximize content quality and enhance the viewing experience

- Support multiple device types and profiles, from small-screen smartphones to large-screen tablets

- Protect content and manage digital rights for end-to-end enforcement of contractual content restrictions

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Any Content from **Any Source**

Any Device on **Any Network**

Azuki Systems™ field/production deployment experience and content owner relationships make Azuki the expert for premium content delivery to devices of all types. Ultimately, this provides MSOs with a unique advantage in the turnkey delivery of premium content to any device over any network.

The MSO Opportunity — Business Case For 'TV Everywhere'

The appetite for online video has shown unprecedented growth fueled by new service offerings such as Hulu and NetFlix. For MSOs, it is an opportunity to develop and implement a 'three-screen' strategy that not only provides value-added services but also creates increased average revenue per user (ARPU) through additional ad revenues and extended pay-per-view opportunities.

'TV Everywhere' is a sticky offering preventing customer loss to competitive OTT threats and ARPU decline. It also provides the opportunities for increasing the subscriber base from customers in market whose homes are already passed as well as the possibility to add off-net customers.

The Azuki Media Delivery Solution

The Azuki Media Everywhere solution is a next-generation media delivery system designed specifically to meet the challenges of in-network and OTT delivery of all types. Its connector-based approach extends the existing MSO infrastructure to mobile devices, rather than replicating existing systems or requiring new procedures. Using a single, automated, and scalable approach, Azuki Media Everywhere supports all major smartphones and interactive mobile tablet devices, enabling MSOs to shorten time to market while optimally and securely extending broadband video delivery services.

The Azuki Media Everywhere is integrated with a client-side delivery agent called the Azuki Media Client. Azuki

Media Client can be embedded in a mobile application and accommodates a variety of packaging ranging from an appliance, private cloud deployment, or home media server/STB.

Azuki Media Client

The Azuki Media Client enforces content licensing rules and manages content delivery beyond the reach of traditional distribution networks. It can be embedded and customized in a mobile app and options can create branded media apps for distribution through app stores. It also implements rights management functions on client devices and manages adaptive streaming of media delivery and playback. Its ability to support the placement of individual and targeted ads, along with extensive analytics and reporting, enables MSOs to mine information based on various user actions and develop new revenue streams.

While OTT delivery brings fluidity to the medium, it is the Azuki media preparation and client-side delivery services that enable a quality user experience on any mobile device. This presents a 'virtual STB' solution architecture that gives end-to-end service controls.

End-To-End Intelligent Architecture

The Azuki platform was purpose-built for OTT delivery, with optimizations that extend superior video entertainment seamlessly across all screens.

Optimized workflow for efficient deployment and delivery

The Azuki connector-based architecture is consistent with existing MSO content-delivery workflows and supports multiple content delivery networks (CDNs). Network optimization accommodates virtual playlists with traffic management and bandwidth controls, and a unified, agile workflow spans acquisition and media preparation for storage and streaming. Compatible with existing workflow components—transcoders, rights managers, ad networks, and storage systems—
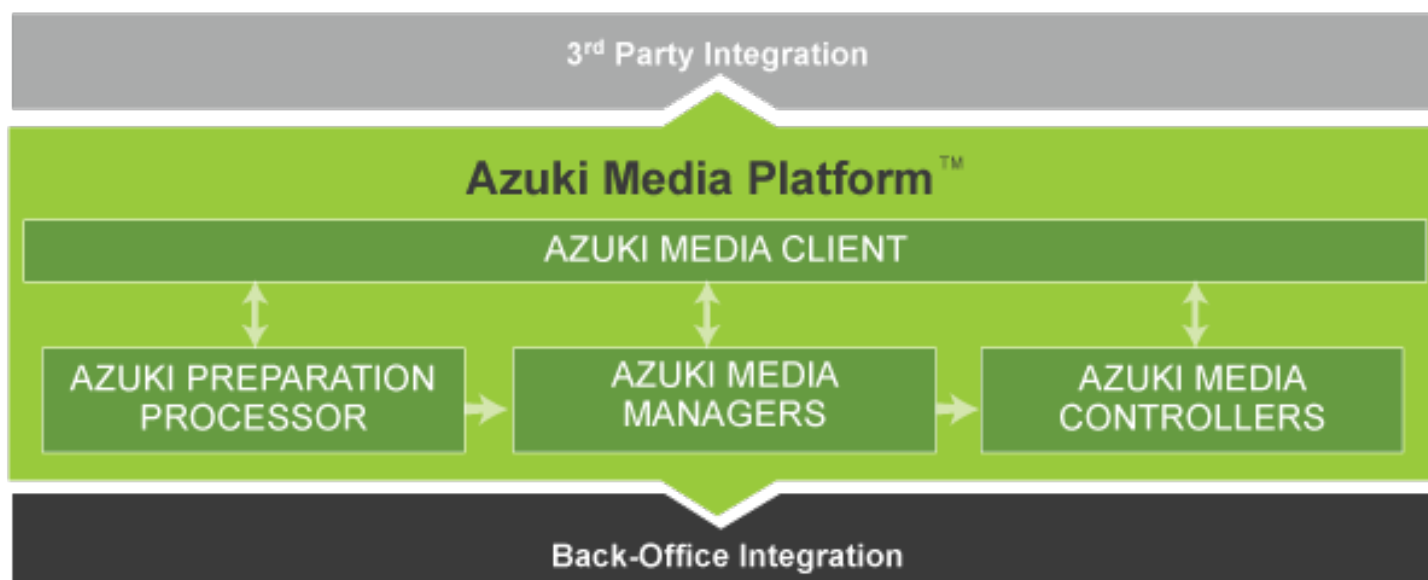
Azuki Media Platform™- Solution Architecture Overview

this scalable and cost-effective rapid deployment architecture employs a private cloud model via a container paradigm.

Universal Digital Rights Management (DRM) optimized for mobile devices

Seamless studio-grade end-to-end content protection supports OTT delivery across all popular mobile devices and supports cross-platform device identification with device-based content licensing and DRM.

Highest-quality HTTP delivery for adaptive streaming and download

Azuki provides a turnkey solution for delivering VoD and live content with a universal ingestion and delivery workflow. The solution uses transcoding profiles optimized for all OTT device form factors and cross-platform segmented streaming for all popular mobile devices.

Session shifting and dynamic interactivity for flexibility, monetization, and analytics

Azuki enables service providers to meet consumer demand for flexibility by extending their existing video offerings to all major smartphones and tablets. Through session shifting, Azuki technology maintains program continuity when moving from one device to another (at home on TV, on a mobile device in another room via WiFi, or remotely via 3G or 4G networks). The Azuki solution leverages media markers (time-based reference points) to provide dynamic interactivity within a video. Markers enable a number of features, including a flexible mechanism to dynamically insert ads into defined points within a video. Azuki functionality also includes interactive virtual streaming, which allows the original ingested video to be shortened in order to create dynamic video previews without the need to process and re-ingest the video. Beyond the monetization benefits of dynamic ad insertion, the digital locker implementation enables integration for store-front and social networking applications, while interactive, targeted advertising can be based on the context of each user device, supported by detailed reporting and analytics.

Streamlined Workflow

Azuki Preparation Processor is responsible for programming acquisition from content generation sources.

Transcode and DRM Wrap prepares the content, including transcoding for specific device profiles, segmentation, and uploading of media.

The Azuki DRM key server function is an integral component of the Azuki Media Everywhere delivery solution. It is responsible for the management of content licenses, including the device registry. Through encryption, it preserves DRM protection over public or private content-delivery networks (streamed, downloaded, or archived offline to storage) by serving user- and device-specific content keys.

The Media Client provides end-to-end controls for bandwidth management and content protection.

The Azuki Content Controller provides service mediation and is responsible for setting up sessions and controlling bit rate and CDN routing. The Azuki Media Client constantly monitors the digital stream to ensure the

highest-quality service, preserves brand integrity, and authenticates usage through an external database that contains each subscriber's viewing rights data.

Intelligent controls in the mobile device support the placement of targeted ads and enable new opportunities for monetization, enhanced social media interactions and extensive analytics and reporting.

The Azuki Advantage

MSOs face the prospect of declining subscriptions and lost VoD revenue without direct and rapid service expansion to mobile devices as consumers seek service alternatives. The Azuki Media Everywhere delivery solution provides:

- Low-cost, highly-scalable media distribution over advanced CDNs
- Support for all major mobile operating systems far beyond the homogenous world of STBs and PCs
- Strong end-to-end DRM protection using a single interface for all major smartphones and tablets
- Common workflow and interfaces compatible with existing first- and second-screen deployments
- Common billing and authentication interfaces
- Support for video markers and session shifting
- Transcoding and service mediation for all major device types, bit rates, and bandwidths
- Seamless handoff between 3G, 4G, and WiFi networks that preserves the user experience

With the Azuki Media Everywhere solution, MSOs can rapidly overcome the challenges associated with mobile content extension and reach mobile consumers with their own 'TV Everywhere' initiatives.

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