THE PROMISE OF TV EVERYWHERE (TVE)
The ability to enable consumers to view and interact with their content on any device, at any time, from anywhere, has long been shared and recognized, yet progress still remains spotty and limited today. The major challenges are how to seamlessly extend the first-screen experience, functionality and revenue model across all consumer devices while embracing personalized and interactive services that these new devices enable.

Service providers must assess their operational readiness in their network’s ability to support the expanded services and in their back-office’s ability to extend to new devices.

CHALLENGES OF PERSONALIZATION
From a network perspective, service personalization, increased usage of Video on Demand (VOD), and live and time-shifted TV represent both an opportunity and a challenge for operators.

Operators have the opportunity to increase revenue streams by capitalizing on a growing trend, but they must also deal with the challenge of a sharp rise in IP unicast traffic that the network may not be ready to cope with. This results in:

- A significant rise in headend and network equipment capital expenditure
- Set-top box (STB) upgrade costs to enable Internet content
- The need for multi-screen companion applications for remote STB control and whole-home DVR functionality

Extending and adapting the existing back-office to support new multi-screen TV services consumption has proven to be a challenge, primarily because service providers are accustomed to only delivering TV services via a pre-provisioned STB, which is distributed by them, over a controlled and managed network.

Adding consumer devices to the mix of TV service delivery requires that the back-office handle dynamic device and user registration and real-time authorization of licensed content on unsecure consumer devices. Also, the back office needs to support additional content rights and new monetization schemes.

NEED FOR WORKFLOW SIMPLIFICATION
As time-shifting services like Start-Over TV, Catch-Up TV and network DVR (nDVR) proliferate, management and delivery of video becomes unwieldy and complex. Various silos are required to deliver services to different devices such as the Apple® iPhone®, Android™, gaming consoles, etc. Multiple sources of the same content are required, thus making caching and personalization difficult due to a lack of a centralized metadata framework.

The service provider’s operational overhead rises significantly as each service is prepared and then delivered as uncoordinated and unrelated services. For example, \( n \times m \) workflows and \( m \)-stages result in \( “n \times m” \) new workflow components.

REALIZATION OF THE SIMPLIFIED WORKFLOW
Three recent technological advancements enable elegant solutions to the above challenges through a unified and consistent workflow framework to deliver the multi-screen, multi-service TVE paradigm.

First is the ubiquity of open platforms such as Comcast’s open RDK middleware framework for STBs and Google TV. This, when combined with the CableLabs® Online Content Access (OLCA) authentication standard, provides an open headend-to-household service framework that supports applications, personalization and Internet services.

Second is the approved MPEG-DASH standard. It provides an open, common video streaming standard via a unified manifest format while supporting multiple existing adaptive streaming profiles such as Smooth Streaming (SS) and HLS. Standardization of adaptive streaming will have the same impact on video as HTTP had on Web services in spawning new HTTP TV services.

Third is the wide availability of Smooth Streaming and HLS as standard adaptive streaming protocols. These protocols open up the possibility of an optimized video workflow and, from here, the vision of a service-enabled network for video to be delivered over any CDN and dynamically controlled to render various time-shifting and personalized video services.

While the benefits of “single workflow” in operation efficiency and management are self-evident, the real benefit comes from the ability to create a single metadata store for each video that can then be leveraged to deliver an “always-available” metadata intelligence for personal services such as a personalized catalog and search and recommendation engines. This makes it possible to isolate unicast traffic to the last mile of the video delivery infrastructure – parallel to the unicast demarcation in a DOCSIS 3.0 architecture. This is consistent with typical video distribution deployments with a multicast core and “last-mile” distribution to the end-user customers.
THE AZUKI SOLUTION
The Azuki Media Platform is a next-generation TV Everywhere solution that is built on top of existing standards and ubiquitous platforms with Azuki’s innovative workflow containers, which are designed to ease the extension of a service provider’s IPTV or QAM video delivery network to become a full-fledged dynamic multi-screen TV Everywhere service provisioning network embracing OTT and Internet content.

Azuki provides a device management and virtualization container that makes the inclusion of consumer devices in a service provider’s TVE lineup a seamless effort because all that the back-office functions see is a normalized view of devices for entitlement and quality control.

Recognizing that TVE traffic runs through the combination of a service provider’s managed network and the unmanaged Internet, Azuki’s network virtualization container provides a seamless arbitration for video delivery that enables distribution of video over multiple private and public transport networks. This container also arbitrates bitrates dynamically per the service provider’s own QoS metrics.

Azuki recognizes the evolving nature of today’s service provider back-office as the anchor for its first-screen TV services. Instead of requiring a new back-office for TVE, Azuki has created a back-office adaptation suite that allows service providers to extend asset, subscriber and entitlement management to new consumer devices over unmanaged networks.

Azuki brings the following industry-first breakthrough technologies:

1. Leveraging its universal video-packaging technologies based on SS/HLS and MPEG-DASH, a video can be rendered into various time-shifting video services including live-to-VOD conversion, Start-Over TV, Catch-Up TV, and nDVR without repackaging. Azuki’s dynamic video service provisioning solution uses manifest and segment virtualization to make this possible. Distributed metadata intelligence allows Azuki to correlate users and devices with media at any point in the delivery process.

2. Leveraging open STB standards, service providers can now enable remote STB control from multi-screens and allow these devices to function as virtual tuners and viewing devices at the same time. Further protected by Azuki’s intelligent DRM client technology, these devices can be used for multi-screen video consumption both at home and on-the-go. New services can be introduced through the mobile
application ecosystem and robust content app-based content protection.

3. Leveraging Azuki’s centralized user metadata framework with distributed access and Azuki’s network-side manifest file manipulation, service providers, for the first time, can deliver personalized, time-shifting video services at the edge of their network with scalable network-wide metadata intelligence, while better managing unicast IP video traffic to the edge of their networks.

**CONCLUSION**

Azuki Systems offers the industry’s next-generation TV Everywhere solution that simplifies the delivery of personalized services to multiple screens in a service provider’s network while preserving existing back-office systems and processes. Service providers can extend existing first-screen TV services to multiple screens with the fastest time to market and most device coverage – with great user experience and ease of operational deployment.

**OUR SOLUTION FOR NEXT-GENERATION TV EVERYWHERE SERVICES**

**AZUKI MEDIA PLATFORM™**

Designed to help service providers deliver next-generation TV Everywhere experiences and services, the Azuki Media Platform is a dynamic, managed and optimized multi-screen video delivery solution, with intelligent client architecture, that enables:

- Live and VOD content ingestion, both dynamically as well as automatically associated with appropriate metadata, social connections, entitlements and rights information.
- One-time content preparation for multiple platforms/networks.
- Dynamic control and switch of programs and services on the fly.
- Personalization of user experience with no changes to the video stream.
- Dynamic and targeted multi-screen ad insertion and replacement.
- “Follow-me” (i.e., bookmarking) content for live and VOD across multiple devices.
- Time-shifted TV (Start-Over TV, Catch-Up TV and network DVR) for all channels across all screens.
- Flexibility to customize and personalize user interface and experience.
- Social interactivity and third-party integrations.
- Advanced search, discovery and recommendation for any content to be discovered, watched or sent to any device for viewing at any time, online and offline.
- Multi-screen real-time content, consumption-based metrics.
- Full digital rights management (DRM) protection with root of trust at all times.
- On-the-fly robust policy enforcement on any device over any network
- Flexible multi-screen monetization options.

Azuki Systems is leading the video delivery revolution to any screen over any network. Azuki’s solutions deliver rich, protected content to any device over any network, allowing service providers to take the complexity out of TV Everywhere (TVE) delivery. The Azuki Media Platform™ enables service providers, mobile operators and brand-name media to combine the power of over-the-top delivery with the highest quality of user experience, content protection, back-office integration and reliability. Azuki is led by an executive team renowned for repeated success in launching disruptive technologies and solving difficult technology challenges to provide customers with a competitive edge. Visit www.azukisystems.com for more information.

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