



# TULIX

SYSTEMS

The market for over-the-top set-top boxes has grown considerably in recent years as many consumers have looked towards devices like Roku, Google TV, and Apple TV to either replace or complement their cable subscriptions. Roku announced this year that it had sold over 5 million units in the United States and Apple has reported sales of over 13 million Apple TVs. Though the exact number of Google TV devices sold is unknown, one can imagine that it is sizeable as well, considering the numerous partnerships Google has forged with television and set-top-box OEMs. These three platforms in particular have established themselves as leaders in their market, which they have achieved by making live streaming to the living room both affordable and convenient for consumers.



### **As the consumption of television content via the internet has grown, so has the number of companies trying to enter the market for OTT devices and platforms.**

So far, none of the set-top boxes or preloaded internet-TV platforms have managed to distinguish themselves significantly from the others through killer apps or features. Though some boast a broader selection of channels or added functionality, the platforms are by and large very similar to one another, both in hardware specs and available content. On-demand offerings from HBO, Amazon, and Netflix make up the most prominent offerings and are available on most devices.

While OTT set-top boxes aren't yet a cable or satellite replacement for most TV junkies, they have been very successful in connecting niche channels with their target audiences. Platforms like Roku and Google TV have allowed small- and medium- size companies to grow their audiences and have given them the ability to compete, on some level, with the major television powerhouses. More and more broadcasters have begun to see the potential in delivering content to OTT set-top-boxes and smart TVs, and as the content available on these devices has begun to increase both in size and diversity, the rate at which consumers are adopting them has grown significantly in recent years.

Though the over 5 million owners that Roku boasts may pale in comparison to the number of cable or satellite television subscribers in the United States, no broadcaster would dismiss that number as insignificant. In fact, most content providers have discovered that not all viewers are the same and that the users of platforms like

Roku, Google TV, and Apple TV are generally much more likely to be willing to pay for the type of premium content available on those devices. With the availability of multiple options for monetizing content, these platforms are one of the easiest and most accessible means for broadcasters to generate revenue from their content through subscriptions, pay-per-view models, or advertisement.

Due to the similarity between the numerous devices on the market, there is still no clear front-runner in the market for OTT set-top-boxes and smart TVs. All devices have fairly large audiences, but consumers have not gravitated towards a specific one *en masse*. What is clear is that the market as a whole is growing at a rapid pace, and broadcasters who are not yet streaming to OTT set-top-boxes or smart TVs are missing out on a large number of potential viewers and, in turn, a lot of potential revenue. In this paper, we will describe the benefits and drawbacks of the major devices currently on the market and discuss the numerous benefits broadcasters stand to gain from streaming their content to branded apps on open platforms like Roku and Google TV.

#### **Roku**

Roku has sold an impressive number of set-top-boxes in its relatively brief tenure and has attracted consumers by partnering with prominent content providers and by implementing numerous well-received features, including games and a headphone jack that lets viewers listen to streams on their TV from their remote. Part of what has made Roku so successful is the open nature of the platform. By allowing third party

development for its channel store, Roku has attracted a diverse collection of content providers. Users can find channels of all types in the Roku store, ranging from the mainstream offerings of companies like Netflix and Redbox to more niche live streams and on-demand videos from smaller broadcasters. Though there is a large selection of content, it is not so large that new channels have a difficult time being discovered.

Unlike Google TV, Roku does not let other companies manufacture devices with the platform, meaning that there is little risk of compatibility becoming an issue for content providers. Almost all versions of the device support either 1080p or 720p HD and all support adaptive bitrate delivery via HLS. Roku channels also support a number of compelling features like DVR, on-demand video, subscription and pay-per-view billing, and more.

#### **Google TV**

Google TV's main advantage is fairly evident. The backing of the internet powerhouse has been the driving force in the adoption of the platform. Partnerships with large television manufacturers has resulted in the software being pre-loaded on numerous TV models, and multiple other OEMs currently offer set-top-boxes that run Google TV. While this variation in hardware may present potential compatibility issues, it has allowed Google to rapidly gain market share and become a viable competitor to Roku and Apple TV.

Like Roku, Google TV has been successful in attracting a large variety of content providers thanks to the ease with which

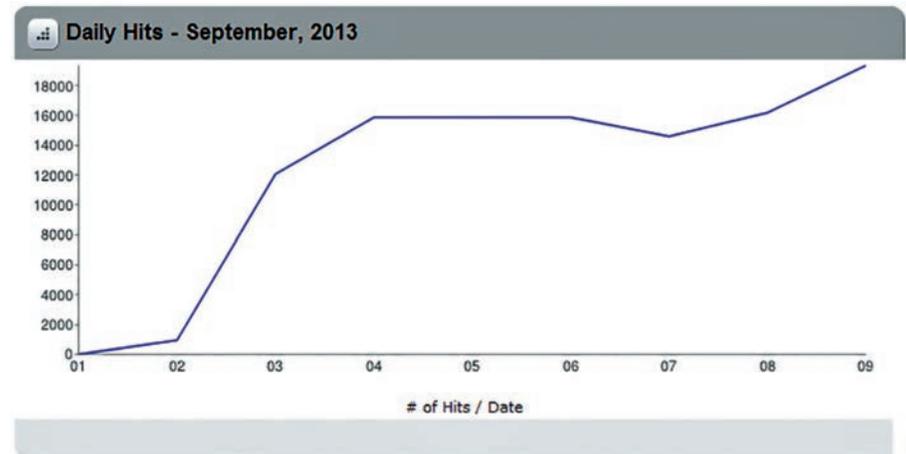


channels can be submitted to the platform's store. Google TV's use of the Android operating system makes the platform very accessible for developers and allows for cross-compatibility with mobile devices that run it. Since applications are distributed via the Google Play store, broadcasters automatically reach audiences across a broad spectrum of devices, including compatible TVs, set-top-boxes, phones, and tablets. Google TV also comes with a version of Chrome, meaning users can consume video content both through applications and the browser.

### Apple TV

As most would have expected, Apple's venture into the OTT set-top-box market has resulted in a tightly controlled platform. While the content available on the Apple TV is certainly high-quality, it lacks diversity and includes mainly channels from large companies like Netflix and Hulu, channels which are also available on Roku or Google TV. The main attraction of the device is the convenience of the AirPlay function, which allows users to stream video directly from iTunes on a computer or from an iOS device.

While Apple has promised to eventually open the platform to third-party development, it remains inaccessible to broadcasters without the leverage or connections to secure a partnership and receive a channel on the device. Viewers can use AirPlay to stream content they wish to watch to their TV, but they cannot take advantage of all of the great features that broadcasters are able to provide on platforms like Roku and Google TV.



### The future for smart TVs and OTT set-top-boxes

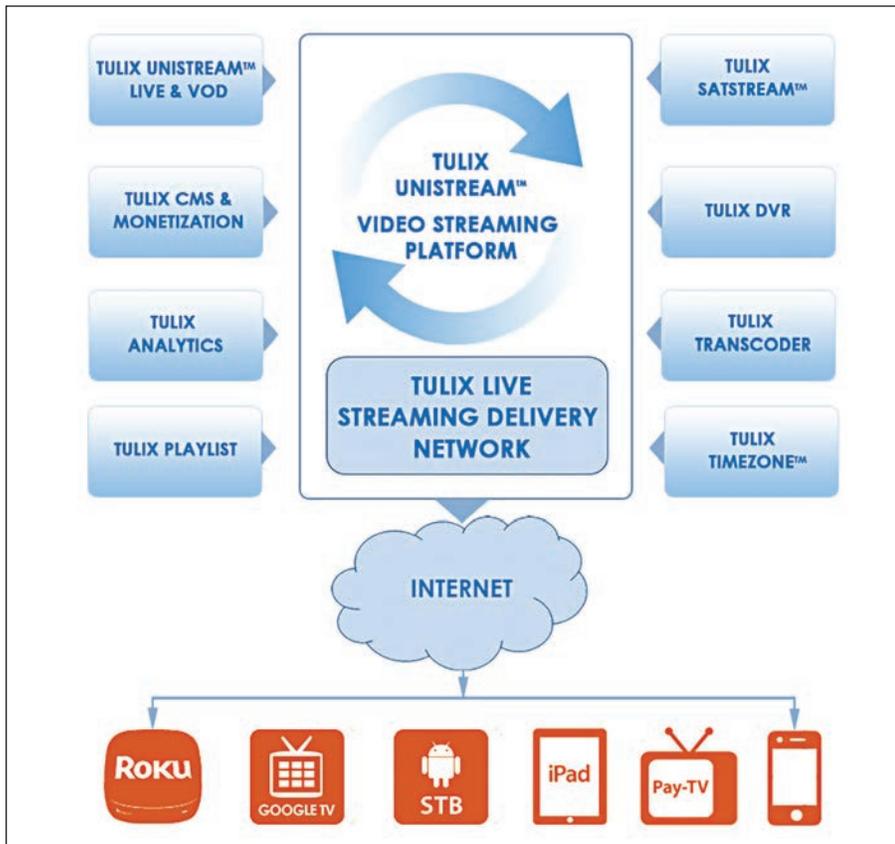
While the devices mentioned in this paper did not instantly bully cable and satellite television companies out of the market as some had hoped, their success and adoption does show that the tide is turning. As content owners begin to look to these devices to expand their audiences, the quality of available channels will only improve. The shift towards internet-connected televisions is being accompanied by a similar shift in the ways consumers pay for video content. Since these platforms provide an open marketplace with many different means to monetize video, they benefit both consumers and broadcasters compared to traditional television delivery.

Consumers benefit from open platforms like Roku and Google TV because they can choose specific content that interests them. There is a lot of evidence to indicate that consumers prefer this kind of *à la carte* model over the alternative and are very willing to pay for content they select

themselves. By streaming video to smart TVs and set-top-boxes and enriching the experience through features like adaptive bitrate, DVR, and on-demand video, broadcasters have few difficulties finding viewers willing to pay to consume their content.

These platforms also allow for a large variety in monetization models, including advertising, subscription, and pay-per-view. This lets broadcasters maximize revenue by choosing the model most suited to their content and the type of audience consuming it. Roku and Google TV apps like those developed by Tulix Systems can be fully integrated with a CRM system that requires viewers to create an account and provide billing information before signing into the channels to begin viewing content. When customers subscribe or pay to rent an individual video, all of the revenue generated goes directly into the broadcaster's account. Since the start-up costs for streaming and monetizing content to OTT devices are very modest compared to satellite or cable delivery, broadcasters

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with quality content achieve sustainable growth and a return on their investment fairly quickly with minimal risk.

## How to get started

The thought of streaming content to devices like Google TV or Roku may seem daunting to most broadcasters at first. It can be difficult to know where to start, especially considering the various components needed to get an application or channel off the ground. First, broadcasters that do not already stream will need a reliable CDN to

stream their video content to audiences around the globe. They require functional and user-friendly middleware to manage and monetize their content across all platforms. Finally, they need someone to develop the application, submit it to the appropriate store, and maintain or update it as necessary.

While it may seem like the process to stream and monetize content on a customized application would require the involvement of numerous companies and solutions, it can actually be quite simple if the broadcaster chooses the appropriate streaming solutions provider. Tulix Systems

specializes in providing all-encompassing streaming solutions and provides all of the services needed for broadcasters to stream to any device, including the OTT set-top-boxes and smart TVs mentioned earlier.

## Live Streaming Delivery Network

When choosing a CDN to stream across multiple devices, broadcasters must consider a variety of factors, including the geographic reach of the network, its bandwidth capacity, and the availability of critical services like adaptive bitrate delivery, HLS, and transcoding. Tulix Systems operates its own CDN that is optimized specifically for live streaming. By using route-optimization technology from Internap and Noction, it ensures that content is delivered to the tier 1 network with the best connection to the end user. With Tulix's Unistream platform, setting up a live stream is possible within a matter of minutes.

Tulix creates customized streaming architectures to meet the unique needs of a diverse array of customers. By utilizing Adobe, Helix, Wowza, and other streaming servers in various capacities, Tulix ensures optimal delivery to each device and end user for its customers, from small broadcasters with single live streams to enterprise clients who require highly scalable and stable solutions for large numbers of viewers. With its own data centers and CDN, Tulix is able to provide a state-of-the-art streaming solution that takes advantage of all the best features streaming technology has to offer, including DVR, on-demand video, transcoding, adaptive bitrate delivery, HDS, HLS, and much more.



The streaming industry continues to evolve at a rapid pace, and broadcasters have to be sure they are using a CDN with stability, quality, and the capability to provide value-added services that consumers are willing to pay for.

### Middleware and Monetization

As streaming technology has evolved, the options available to viewers wanting to consume OTT content have multiplied. In turn, so have the options available to broadcasters hoping to provide a premium experience that consumers will be willing to pay for. Many broadcasters and content providers now provide multiple live channels with DVR systems on their applications and websites, as well as full

video on-demand platforms. These broadcasters need a content management system (CMS) that lets them upload and categorize video content and publish it automatically across all devices, including Roku and Google TV applications.

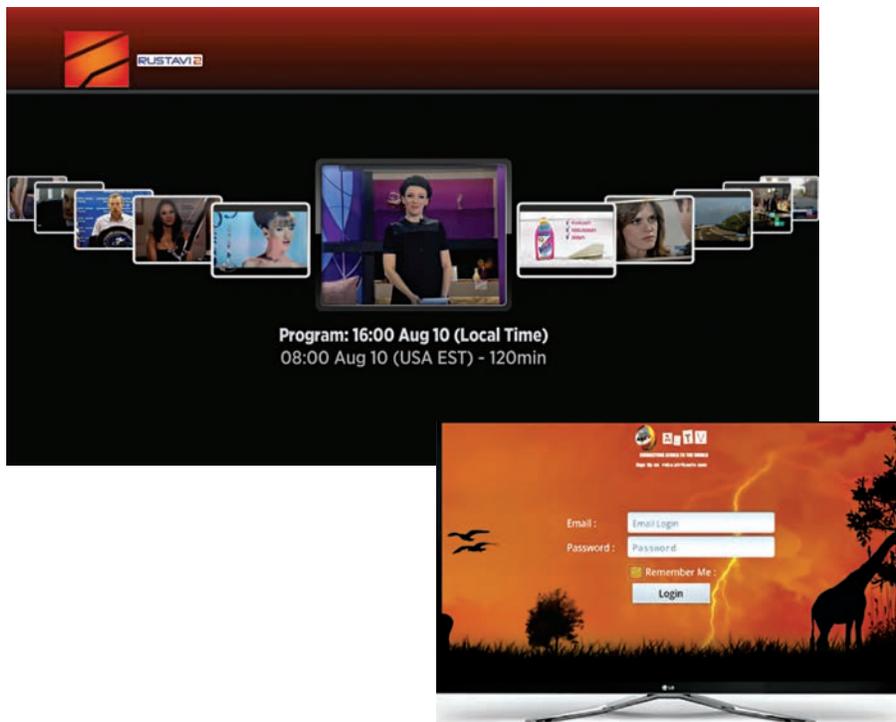
In addition, broadcasters who want to generate revenue from their content need a billing system that works on their website and all of their streaming applications. Tulix provides a complete admin console that includes a CRM and a billing system that accomplish all of the above. The system lets broadcasters upload on-demand video and live streams, categorize them to make them searchable, publish them to all devices, set pricing for specific content or subscription rates, create age-restrictions for mature videos, manage viewer accounts, generate

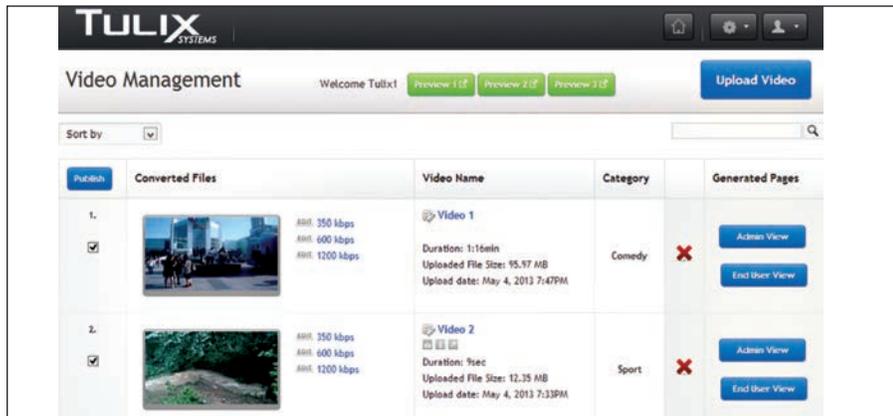
revenue, and perform numerous other administrative actions.

### Application Development

While web-based streams can be viewed on televisions in a variety of ways, including through the recently-released Chromecast, applications on Roku and

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Google TV provide a much higher level of engagement with content and support numerous features beyond single-stream delivery that make the viewing experience more convenient and enriching for the viewer. However, creating a feature-rich channel with high-quality content is difficult without the help of a reputable application developer.

Tulix has developed countless branded applications on both Roku and Google TV for broadcasters of all sizes. Content providers can easily upload and manage content to all of their applications at once using Tulix's CMS and monetize it using Tulix's subscription billing engine or pay-per-view system. By providing their content on both Roku and Google TV, broadcasters reach the largest possible audience, since the platform provided reaches computer and mobile screens by default.

### A complete solution

There are a number of reasons why broadcasters should look to a single provider when seeking to deliver content

across all screens. By choosing a company with an end-to-end solution, broadcasters can be sure that every aspect of it will integrate seamlessly with the others. Choosing an all-in-one solution also provides tremendous cost savings and ensures a minimal time for development and set-up. All-in-one solutions like the one Tulix provides let broadcasters upload and manage their content, stream it to any device around the world with numerous value-added features, and monetize it from just a single interface.

Tulix's customers are all unique in the type of solutions and features they require. They include entrepreneurs who generate revenue streaming international television stations to expatriates in other countries using a subscription system, independent film distributors with full on-demand streaming and pay-per-view billing systems, organizations who broadcast conferences to their employees, and religious broadcasters who provide their sermons free of charge to their communities. With a full suite of real-time and historical analytics that includes statistics about views by device, length of

video consumed by individual users, geographic location of viewers, and more, broadcasters can learn about their viewers and make all necessary adjustments to improve audience engagement. No matter what the type of content or the audience viewing it, broadcasters are sure to find the right solution to meet their needs.

### Conclusion

The market for OTT set-top-boxes and smart TV may still be somewhat fragmented, but there is no doubt that it is growing rapidly as a whole. Many broadcasters may approach the idea of creating a channel for their content on Roku and Google TV with caution, either because they are worried about the cost of development or the potential for generating revenue. Though there are start-up costs (as with any business), the amount of savings that streaming content to OTT devices provides relative to traditional means of delivery are substantial.

The past few years have more than shown that consumers are willing to pay for high-quality premium content that meets their interests. The versatility of having numerous monetization options for these platforms creates the optimal climate for broadcasters to create a profitable business by streaming video through branded applications. Whether broadcasters move quickly or sluggishly in moving to these new platforms, consumers will race towards them at an ever-increasing speed as increases in functionality and declines in cost make them a more and more attractive alternative to cable and satellite subscriptions.