



AppCloud

Introducing AppCloud

ActiveVideo AppCloud is a virtualized video app platform that delivers content from the world's favorite OTT apps to almost any TV

AppCloud is designed to solve three specific challenges for Operators:

1. Hardware Capabilities Gap: many STB and SmartTV devices are not equal to the demands on processing and memory that OTT apps need, requiring a new STB, a third-party OTT device, or an HTML5 app back-ported to the current device
2. Expensive Development & Support Costs Increase Time-to-Market: the complexity and cost introduced to the development life cycle by supporting a single OTT app across multiple hardware and operating system configurations adds to extended development time, cumbersome updates, and inevitable, inconsistent user experience across platforms
3. Third-party ecosystems co-opt users and force ceded control: most operator-tier solutions today provide a holistic solution at the expense of decreased control over app selection, user experience, and account ownership

Overview

AppCloud provides the means to deliver the most recent version of any *10-foot* OTT video app to any device, regardless of hardware capabilities or operating system.

ActiveVideo has addressed the challenges facing Operators by creating a platform that runs first-party Android APKs in the Cloud instead of on the STB or other subscriber device. By taking advantage of unlimited cloud processing power and memory to run both application and player with the highest performance, while delivering the DRM-encoded content stream directly from CDN to the end-user's device maintaining complete content security. The result is an extremely performant, uniform, and high-quality video experience to a heterogeneous mix of TVs, STBs, and devices from a single app, providing the best UX with minimum development effort.

Bridging the hardware capabilities gap

OTT apps today are designed to run locally on the device. In this way it mirrors the mobile phone ecosystem. However, three major differences between mobile phones and OTT devices result in a massive capabilities gap between the processing power and memory these apps demand, and the capabilities of the current generation of STBs and SmartTVs to deliver them.

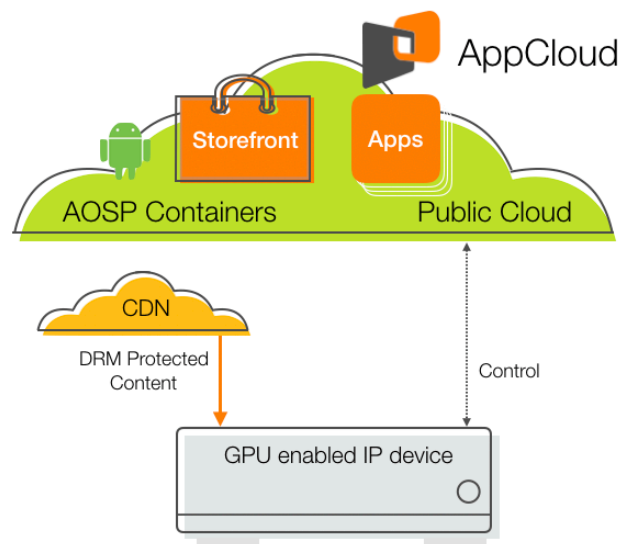
The first is that mobile phones are replaced on average every 32 months, resulting in fewer legacy devices than the STB and Smart TV market where device lifespan typically exceeds more than 5 years. Secondly, the mobile phone market has only two major platforms, while there are significantly more Smart TV and STB operating systems, the number of which are exponentially multiplied by the variance in middleware vendors and platforms.

Lastly, STBs and similar devices are designed to do one thing -- decode video -- and thus cost tens of dollars rather than hundreds, and as a result the computational power available to mobile phones and STBs varies drastically.

The end result of these disparities is that the STB device market is wildly more heterogeneous and underpowered than the mobile phone ecosystem, which compounds significantly an operator's ability to deliver an OTT experience on existing hardware.

ActiveVideo AppCloud offers operators a solution to this problem by allowing a single native app, running in the cloud, to deliver the latest OTT experience to otherwise underpowered devices, running any OS, so long as they have a GPU.

AppCloud employs first-party apps that have been previously developed for either the Android TV or Fire TV platforms leveraging code reusability to go to market quickly. App onboarding takes days rather than months, allowing operators to deliver the most recent version of first-party OTT apps to the widest audience across diverse hardware implementations.



- ⊕ AppCloud lives in the public Cloud, delivering apps that run in a virtualised AOSP environment
- ⊕ AppCloud delivers direct to GPU-enabled IP devices - no premise equipment needed
- ⊕ All DRM and video content is delivered end-to-end, direct to device

Addressing extensive development and support costs

Operators who recognize the importance of providing OTT apps to their customers have three options.

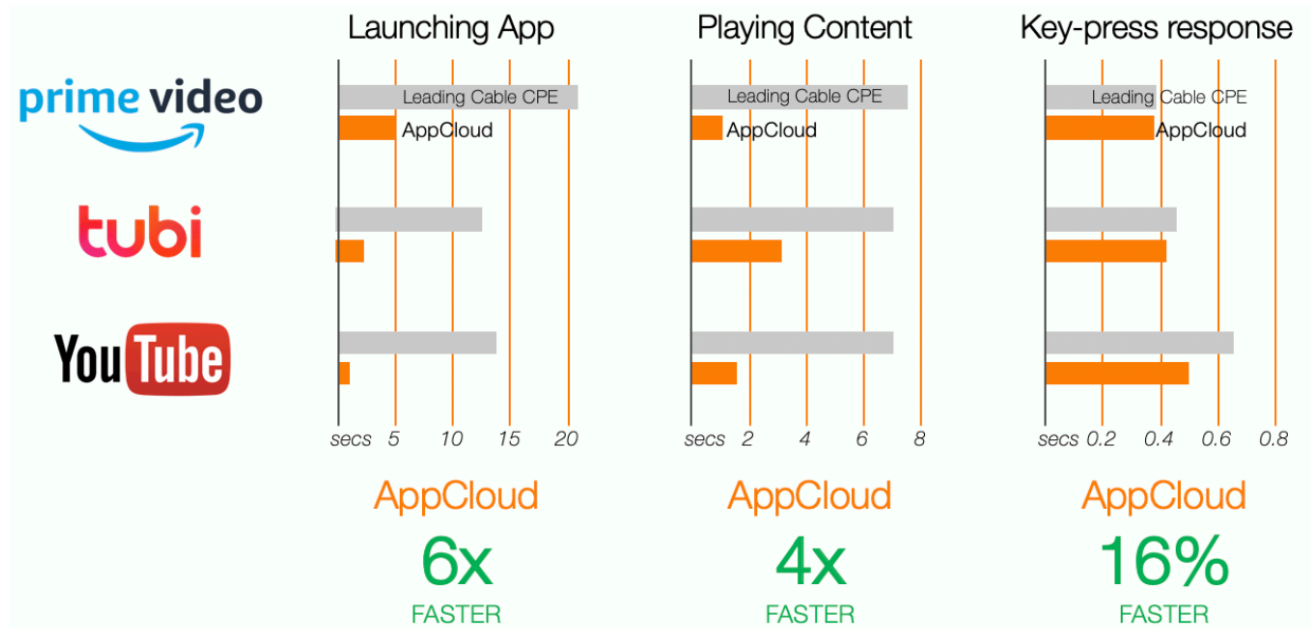
Options two and three entail a new rollout, which is costly, serves only a small percentage of the install base, and is likely to leave operators in the same boat three years from now as the demands of the OTT apps continues to increase. They are expensive, short-term solutions that come at the risk of losing control of the consumer and the user experience.

- 1 **Develop a version of the app targeting the current generation of STBs and SmartTVs. This will usually be an HTML5 version to maximize portability**
- 2 **Update the device and implement a bespoke version of Android OS (AOSP)**
- 3 **Update the device and implement a third-party operating system such as Roku or AndroidTV Operator Tier**

The first option is most commonly selected to maintain control and leverage existing hardware. However, because content providers are often reluctant to create bespoke versions of their apps for narrowly-targeted devices, the cost of app development falls to the Operator, with a substantial development cost, often exceeding \$1MM per app. As first party apps evolve quickly and are updated several times per-year in the Android and Apple app stores, the bespoke version of the app is infrequently, if ever, updated, and it becomes a static release, falling behind the capabilities of the same app on other platforms, and eventually can be decertified by the content provider.

These bespoke apps are usually written in HTML5 for portability but at the cost of performance and while this allows operators to offer a version of the app, it introduces a significant UX issue in application startup and time-to-first-frame. This trade-off is an artifact of HTML5 as on mobile platforms, native apps are on-average 35% faster than HTML5 apps, and this difference increases when running HTML5 apps on legacy hardware.

In recent tests using three popular OTT apps, AppCloud launched 6x faster than the HTML5 version on the box, the time to first-frame was 4x faster, and the UX interface and key-press response was still slightly faster than the HTML5 on-box version. [See graphic, over.]



Ceding control to third parties

Third-party platforms such as Roku and AndroidTV provide reference implementations and immediate access to existing app stores. This is extremely compelling, but comes at the cost of surrendering control over the ecosystem and subscribers. These platforms require users to create an account on their platforms before accessing OTT content. This positioning ensures that the users first experience is via another party's platform, and creates a fundamental tension between user ownership, UX priorities, and even monetization. These platforms also require OEMs to make the contents of the entire app store available to consumers, including apps from competitors and OTT variants of linear offerings. In contrast, AppCloud is a technology platform, not a consumer product: our goal is to make available to consumers only those apps the operators want to surface, without ceding user- and app-control to third-parties.

Why AppCloud?

For Operators, ActiveVideo AppCloud provides the means to deliver and maintain the best possible OTT experience on existing hardware. It eliminates the need to develop custom OTT apps for devices running unique operating systems, or those that are underpowered, in effect extending delivery of their UX and content to the widest-possible range of STB and consumer devices designed for the *10-foot* experience. It simplifies the certification, testing and app management required to support a heterogenous marketplace of devices, and provides the best possible 10-foot OTT experience for consumers.



activevideo.com

ActiveVideo brings new TV experiences to life, for as many people on as many devices as possible. Leveraging the power and flexibility of virtualization, we enable the world's leading service providers to offer app-based OTT services, delivering the very best user experiences to their subscribers.

Visit our website or contact your local ActiveVideo representative for more information.

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