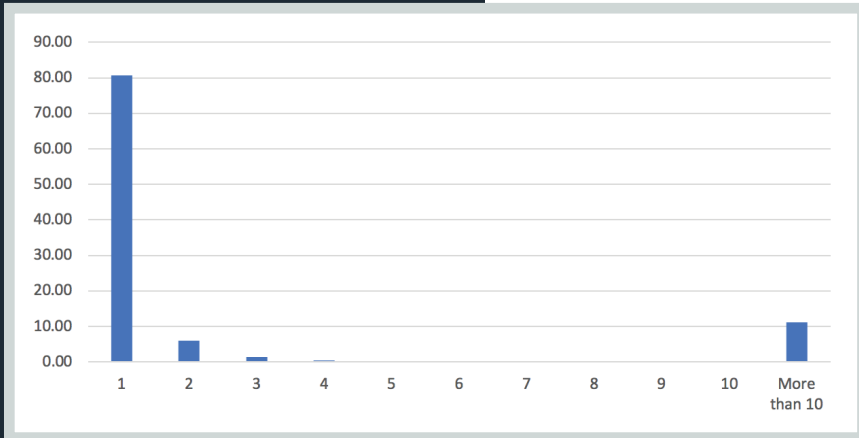


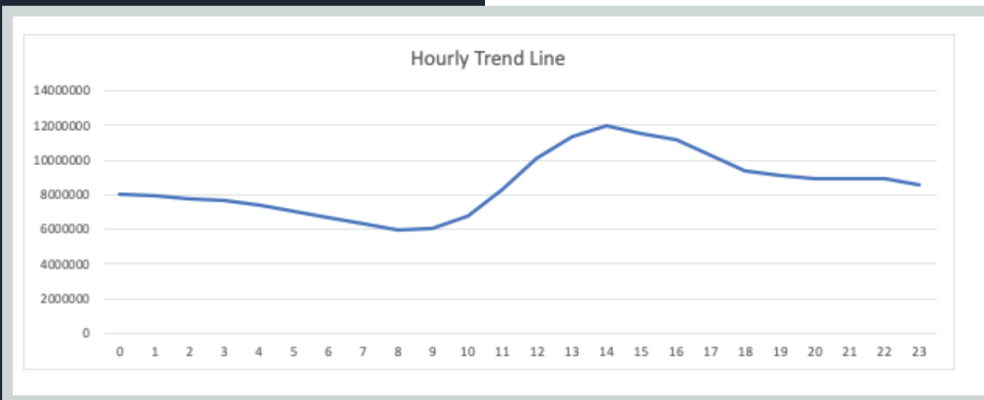
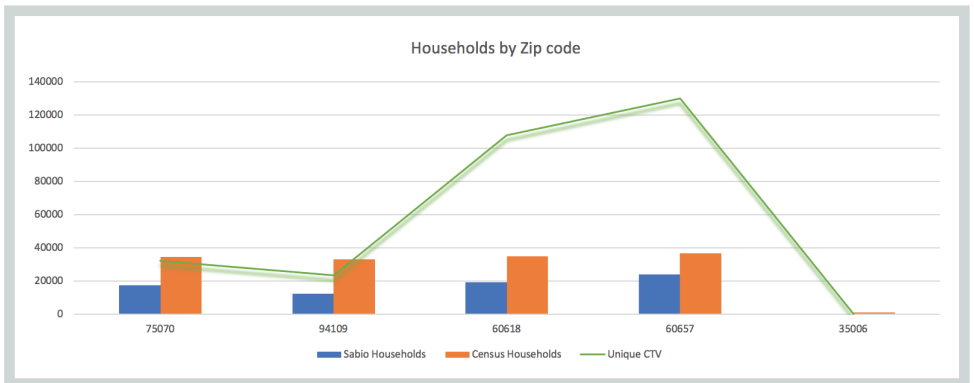
CTV Ad Fraud Research

Below are some of our findings that can help both the vendors, advertisers and publishers tackle some of the fraud on their inventory:



On average we see 80% of households have a single smart TV. This number could vary based on the city location, size of the household and income level. But we found that we see these single TV households tend to have an average of 6 connected devices such as mobile phones, tablets, play stations etc.

Sabio inventory is on the rise, we have been able to capture 60-65% of smart TV household inventory across majority of zip codes. (compared to Census households shown here)



We observed the viewing trends of hundreds of apps and below is a sample of one of the news channels where we see traffic trailing off after midnight and starts ramping up mid-afternoon.

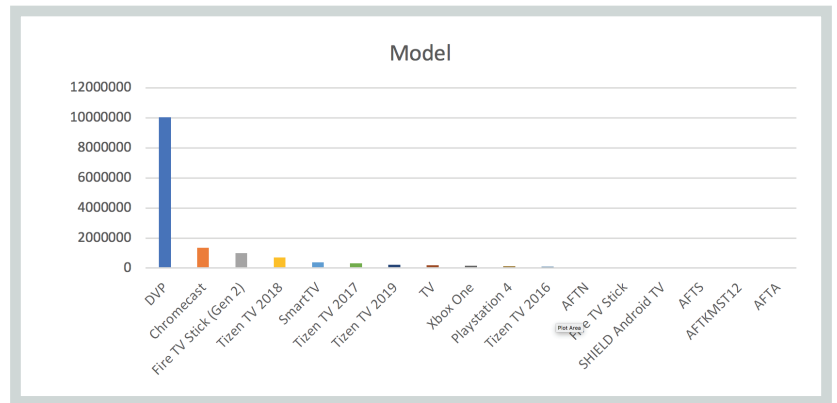
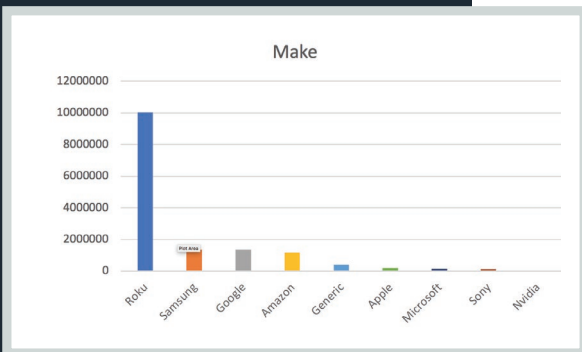
For app related spoofing, we examined the names and bundle IDs of hundreds of apps. Although IAB has published naming conventions across Amazon, Apple and Roku - we have seen quite a few deviations. For example, 87% of apps we see on Roku are non-numeric and in all different formats as shown below:

com.roku.thegoldcollectiondramatic
 com.tvtimedia.mysteryflix.roku
 com.roku.letsplayfortnite
 com.roku.pittsburghrealestate
 com.zmg.tricities.roku
 roku.freemoviechanneldocs
 com.roku.sherlockholmes
 com.roku.wtok
 com.roku.georgewbushspeeches
 com.tvtimedia.thewhisperingshadowseries.roku

com.roku.thesilvercollectioncomedy
 com.roku.funnystoriesforkids
 com.wpix.app
 com.roku.rollouttime
 com.roku.wildventure
 crunchyroll.roku_id
 com.lightcast.roku.universitychannel
 com.roku.motorvidz

Given every vendor follows a different pattern of sending app names and bundle IDs, the fraud in these apps is hard to figure out.

Sabio Universe Make and Model:



Example of traffic on some of the older devices with OS version prior to 3.0

