TV Conversion Module Overview & Methodology

Mar 2020

iSpot.tv

Table of Contents

iSpot.tv

Introduction

iSpot.tv measures impressions and view rates of TV advertising in a large-scale manner across over ~14M IP-enabled TVs. Each TV set is connected to the home network, making the home IP address accessible to iSpot. This uniquely enables iSpot to connect TV ad exposures across our ~14M TVs with a brand's 1st party data sets that are associated with IP addresses. This results in powerful closed-loop analytics around how TV creative, media, and frequency drive sales and other critical KPIs. The entire process is done in a Personally Identifiable Information (PII) compliant manner.

How it Works?

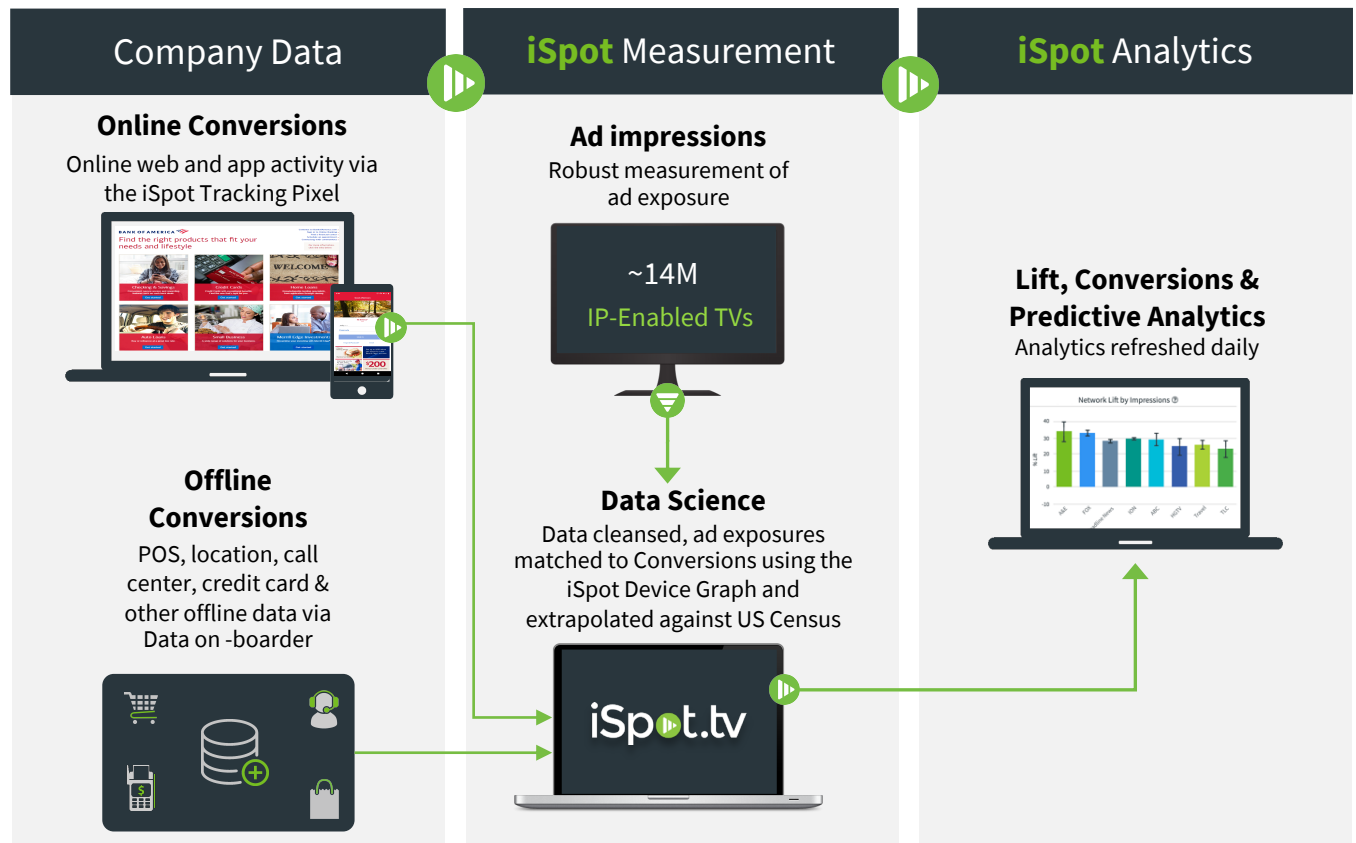| Company Data	iSpot Measurement	iSpot Analytics
Online Conversions Online web and app activity via the iSpot Tracking Pixel	**Ad impressions** Robust measurement of ad exposure ~14M IP-Enabled TVs	**Lift, Conversions & Predictive Analytics** Analytics refreshed daily
Offline Conversions POS, location, call center, credit card & other offline data via Data on -boarder	**Data Science** Data cleansed, ad exposures matched to Conversions using the iSpot Device Graph and extrapolated against US Census	

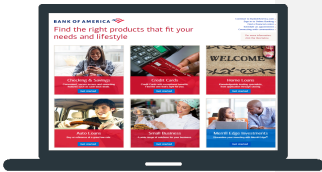Figure 1: Data collection and flow into the iSpot real-time dashboard

Note: If there are over 5 TVs associated to an IP (these tend to be bars, hotels, business etc.) we remove those devices from our population. In addition if we see over 10 digital devices (these tend to be Wi-Fi hotspots, mobile data etc.) associated to an IP we remove those devices as well from the population. This evaluation is performed daily. For more information click here.

Deterministic Attribution

A high confidence 1:1 deterministic mapping is established between the brand's first party data and the iSpot population. When a user within the matched population performs a digital activity on a client's owned & operated property, we can see exactly which TV ad(s) the user was exposed to, and how far in advance of the action the exposure occurred. We can attribute TV ad exposures across national, regional, local, OTT and VOD environments, including time-shifted views (up to C30.)
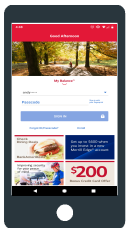
iSpot Tracking Pixel

The pixel is an invisible 1x1 image in GIF format that is placed on the advertiser's website and/or mobile app

Example Code for Websites:

Example Code for mobile apps:

For iSpot's full TV Conversion integration guide including pixel setup click here:

TV Conversion Pixel Implementation Guide

iSpot.tv

TV Conversion Overview Report & The Dashboard

In the Conversions Overview report, the default view includes ALL conversion types being passed to iSpot. A client may elect to pass one or many parameters or conversion types to iSpot.

Example Parameters (or conversion types)

Web Visit	Web Ecommerce Purchase	App View Item
Web View Item	App Engagement	App Add to Cart
Web Add to Cart	App Install	App Sign Up
Web Sign Up	App Remove	App E-Commerce Purchase

Below is a screenshot where a client is passing 3 conversion types/parameters (i.e. Web Visit, Engagement, or Purchase.) In the default view, you will notice that **no specific conversion type is denoted**. It is deduped every 24 hours (12:00 am-11:59 pm ET) and by household IP / by conversion type.
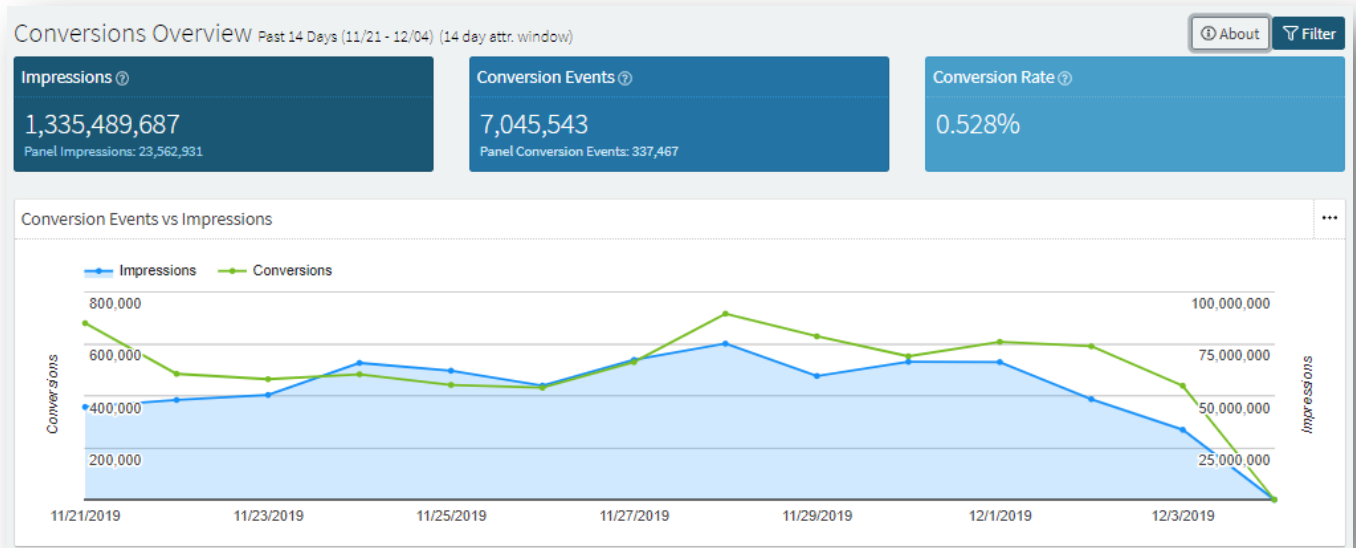

Figure 2: The TV Conversions Overview report in the iSpot Analytics Dashboard
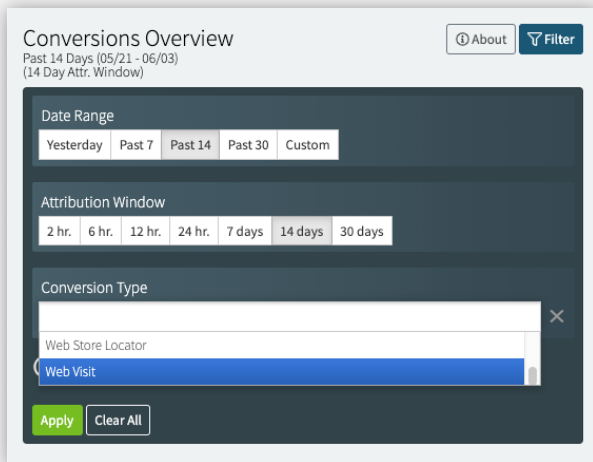
TV Conversion Methodology

iSpot.tv

Conversion Types & Custom Data in the Dashboard

To understand conversions by a specific parameter type or by specific data being passed to iSpot via the pixel, a user must utilize filters to fine-tune their analysis.

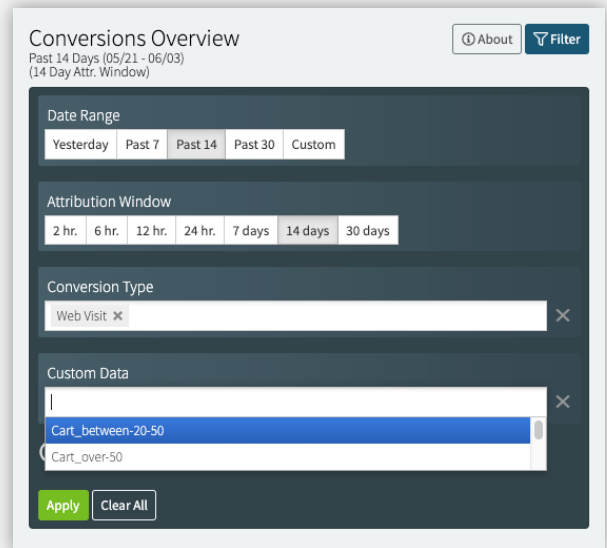| Conversion Types	Custom Data
To parse out a conversion type, a user needs to select **filter > conversion type** and select the specific parameter you would like to analyze. The conversion type filter can be utilized in conjunction with a custom data filter.	Unique data types passed to us by the client may also be considered. Values could include source, user types (logged in vs. not), coupon, etc. To parse out custom data, a user needs to select **filter > custom data**

Note: Only one conversion type filter may be applied at a time.

Figure 3: View of the Conversion Type filter on the left and Custom Data filter on the right
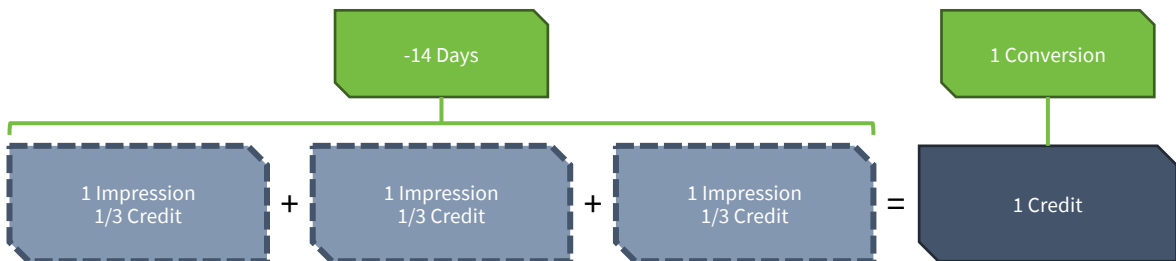
Attribution Models

iSpot offers two attribution models. Both models provide fractional credit and look back in time from the point of exposure (an impression on TV) to when the conversion occurs.

The below example illustrates how each of the two available models allocate credit to each touchpoint (ad impression) leading up to a conversion within a given attribution window.

Fractional Linear (iSpot's Default Model)
Each impression gets partial but equal credit.

-14 Days				1 Conversion
1 Impression 1/3 Credit	+	1 Impression 1/3 Credit	+	1 Impression 1/3 Credit	=	1 Credit

Fractional Weighted
Each impression gets partial credit, but the ones closer to the conversion event get a larger portion.

-14 Days				1 Conversion
1 Impression 1/8 Credit	+	1 Impression 3/8 Credit	+	1 Impression 1/2 Credit	=	1 Credit

The Date Range + Attribution Window

Within the TV Conversion module, there are two aspects that control the analysis; the date range and the attribution window.

Date Range

This is the desired date range of the analysis. Here you are selecting when conversion(s) happened.

Attribution Window

The maximum length of time between the impression exposure and conversion event.

For Example

The advertiser has been ramping up their TV spend for the holiday season over the last month to build awareness of upcoming promotions. Their media team wants to know how many website visits they received during the time period (date range of analysis.) Based on the price point of the product, they feel that someone exposed should ultimately act and visit the website with a two-week time period (attribution window.)

Conversions Overview 03/05/2019 - 06/02/2019 (14 Day Attr. Window)   About   Filter

Date Range   Yesterday   Past 7   Past 14   Past 30   Custom

Attribution Window   2 hr.   6 hr.   12 hr.   24 hr.   7 days   14 days   30 days

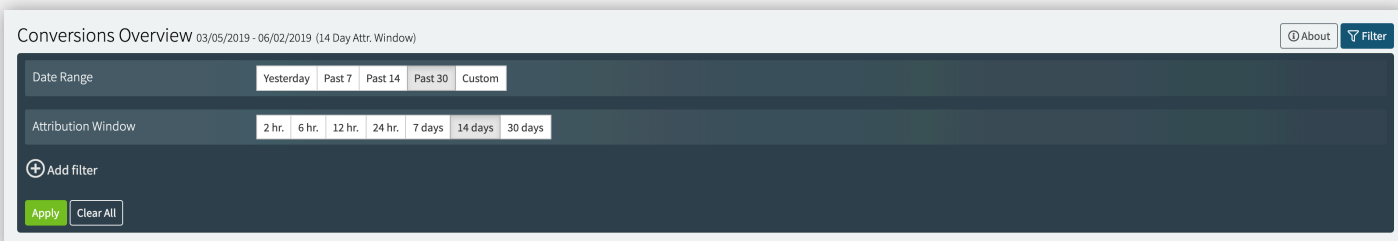⊕ Add filter

Apply   Clear All

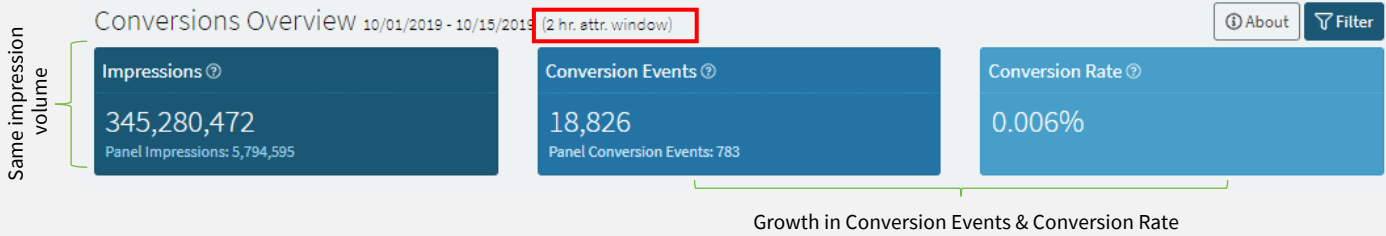Figure 4: View of the date range and attribution window in the TV Conversion module

- The date range and attribution window both default to a 14-day window
- The attribution windows are pre-defined and global features to the TV Conversion module
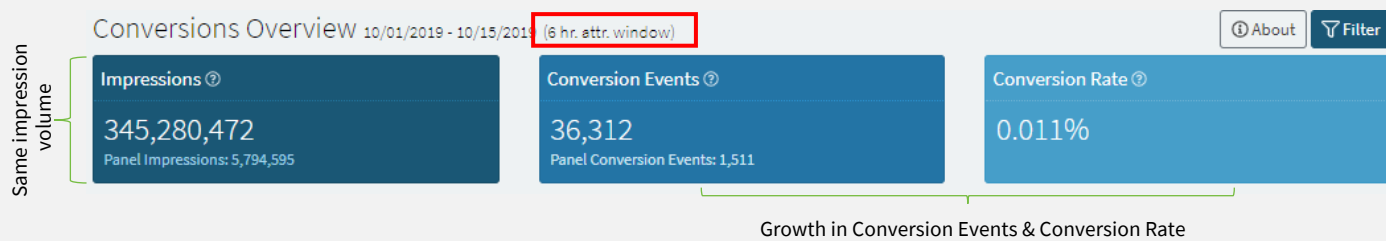
Sub 24-Hour Attribution Window

If you are utilizing an attribution window 24 hours or below, you will see a growth in matched conversion events and conversion rate, while the impressions stay consistent. This is because impressions are tied to a full 24 hours whereas the conversion events are based off the attribution window. The conversion rate grows because it is based off the conversion events divided by impressions.
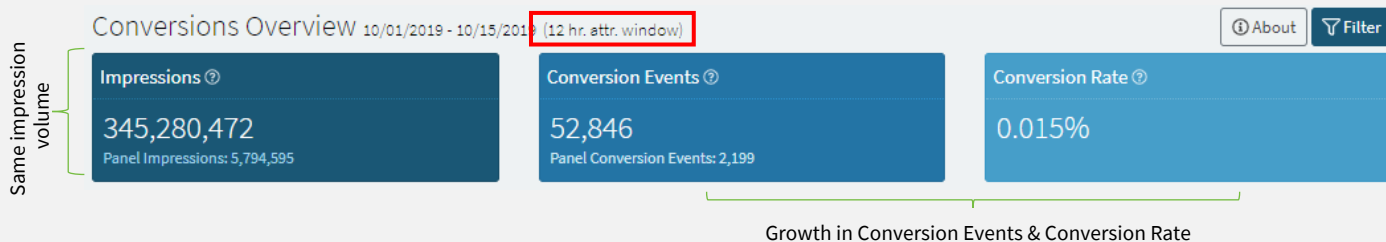
For Example

2 hr. attribution window

Conversions Overview 10/01/2019 - 10/15/2019 (2 hr. attr. window)   About Filter

Same impression volume

Impressions	Conversion Events	Conversion Rate
345,280,472	18,826	0.006%
Panel Impressions: 5,794,595	Panel Conversion Events: 783	

Growth in Conversion Events & Conversion Rate

6 hr. attribution window

Conversions Overview 10/01/2019 - 10/15/2019 (6 hr. attr. window)   About Filter

Same impression volume

Impressions	Conversion Events	Conversion Rate
345,280,472	36,312	0.011%
Panel Impressions: 5,794,595	Panel Conversion Events: 1,511	

Growth in Conversion Events & Conversion Rate

12 hr. attribution window

Conversions Overview 10/01/2019 - 10/15/2019 (12 hr. attr. window)   About Filter

Same impression volume

Impressions	Conversion Events	Conversion Rate
345,280,472	52,846	0.015%
Panel Impressions: 5,794,595	Panel Conversion Events: 2,199	

Growth in Conversion Events & Conversion Rate

The Date Range + Attribution Window in the Dashboard

The iSpot dashboard is anchored around the time of the conversion and utilizes a lookback window. When a date range and attribution window are applied, several things are happening.

1) The date range will pull the conversions that occurred during the time period

2) The attribution window will pull impressions leading up to the conversions that occurred during the date range.

3) Each individual date within the date range, will have its own impressions as determined by the attribution window

Below are three different examples illustrating what you will 1) see within the dashboard charts and 2) how the attribution window works and applies credit to each exposure
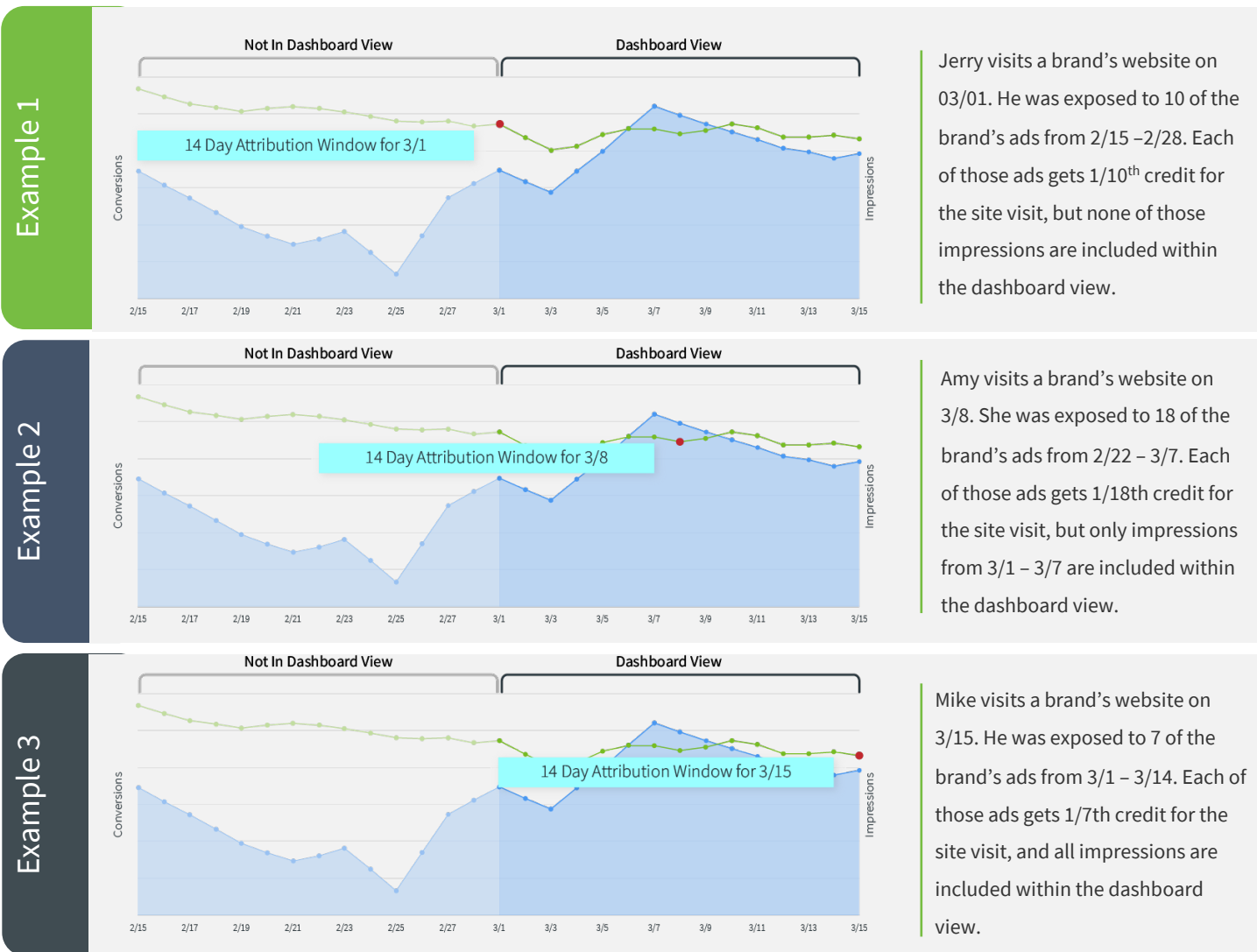
Example 1

Jerry visits a brand's website on 03/01. He was exposed to 10 of the brand's ads from 2/15 –2/28. Each of those ads gets 1/10th credit for the site visit, but none of those impressions are included within the dashboard view.

Example 2

Amy visits a brand's website on 3/8. She was exposed to 18 of the brand's ads from 2/22 – 3/7. Each of those ads gets 1/18th credit for the site visit, but only impressions from 3/1 – 3/7 are included within the dashboard view.

Example 3

Mike visits a brand's website on 3/15. He was exposed to 7 of the brand's ads from 3/1 – 3/14. Each of those ads gets 1/7th credit for the site visit, and all impressions are included within the dashboard view.

Figure 5: Three various illustrations of what is displayed within the dashboard and how the date range and attribution window work

Exception to the Rule: TV Conversions Airing Report

Methodology for the TV Conversions Airings report differs from all other TV Conversions reports.

The other TV Conversion reports utilize the lookback window and are anchored on the time of the conversion. The Airings report looks forward since it is anchored around the time of the airing.

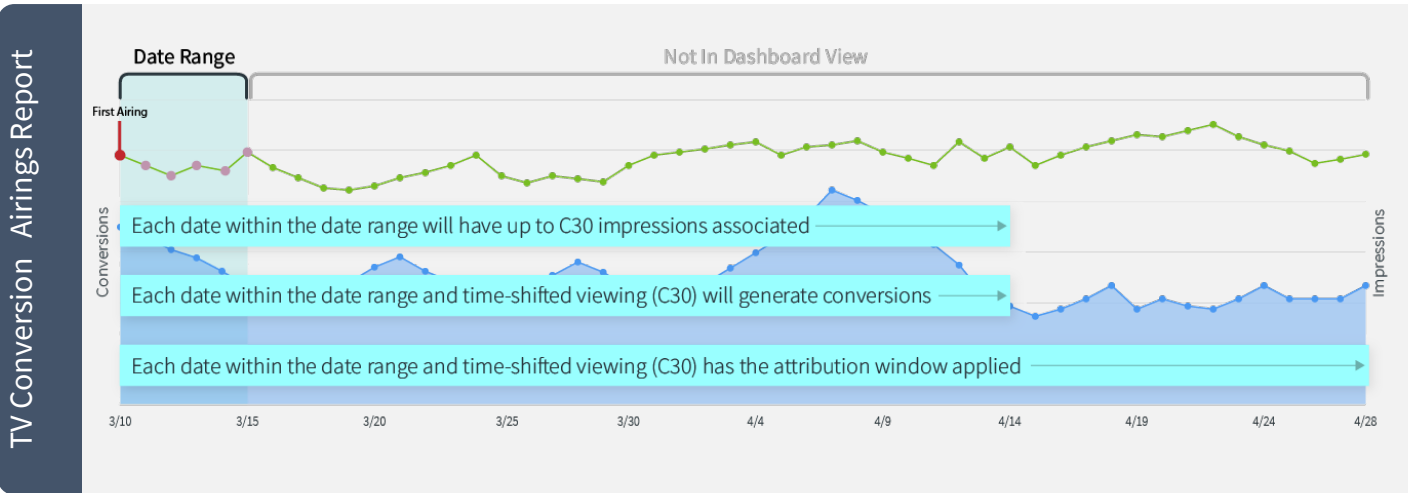| TV Conversions: All Reports Except Airings	TV Conversions: Airings Report
• Date range indicates **when conversions happened** on website/app • Attribution window **is the maximum length of time between the impression and conversion event (looking back in time)**	• Date range indicates **when airings occurred** for ads • Attribution window **is the maximum length of time between the impression and conversion event (looking forward in time)** • **Matched impressions** only are included - those associated to a known airing, including time-shifted viewing up to 30 days after airing (C30)

Tip: If you utilize the TV Conversion Airings report, the data will fluctuate up as time-shifted impressions occur. It is advised to select a date range and attribution window that has eclipsed full time span.

▶ **Visual Example on next page** ▶

Exception to the Rule: TV Conversions Airing Report

TV Conversions Airing Report

The below figures illustrate how the dashboard works if you utilize the Airings report within the TV Conversion module. This report is anchored on the time of the airing. What this means is over the lifetime (defined as C30) the creative that aired will continue to acquire impressions and associated conversions.

A brand executes an opportunistic buy on Ellen. The airing was on **3/10**. The brand pulls data from **the iSpot dashboard and sets the date range to 3/10 – 3/15** and utilizes **a 14-day attribution window**.

Within the airings report, the dashboard is pulling data within the date range. What is happening and will continue to happen is for every date within the date range, impressions will continue to accumulate through the lifetime of the airing (C30) and each date within the full airing range (date range -> lifetime) needs to be supported by the attribution window. In this example that is 14 days.

TV Conversions: All Reports Except the Airings Report

Within TV Conversions, there are six reports targeted at helping advertisers understand how to optimize their media spend based on key media criteria:

Spots	Network	Shows
Show Genre	Dayparts	Creative

These reports all utilize the lookback window.

Within each report, you can download the raw data behind the chart or table below, sort the columns of data on screen (by clicking the column headers) and filter to fine-tune your analysis.
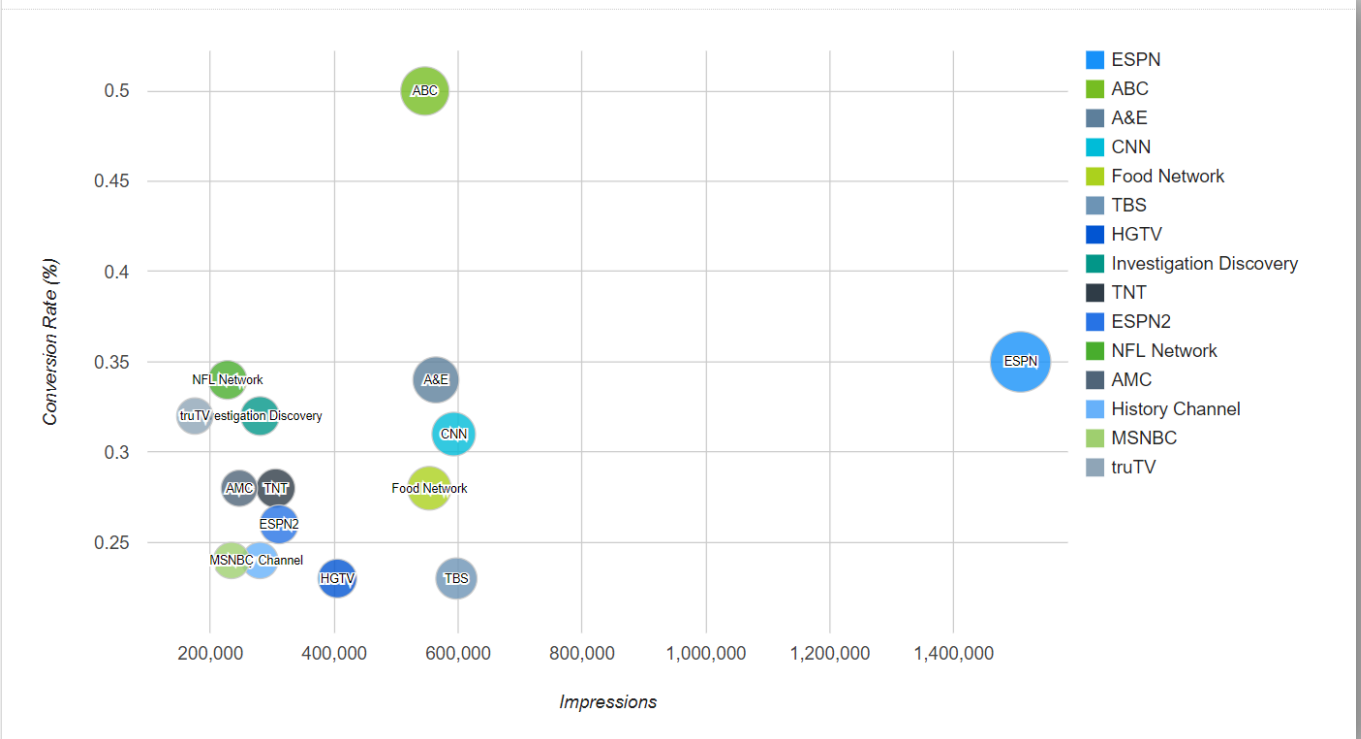

Figure 6: View of Network report found under TV Conversions > Optimization > Media Conversions

Note: When you hover over the bubbles on the chart, a dialog box appears, and three metrics are displayed. The X, Y axis and then what the size of the bubble represents. In the TV Conversions module the size represents conversion events.
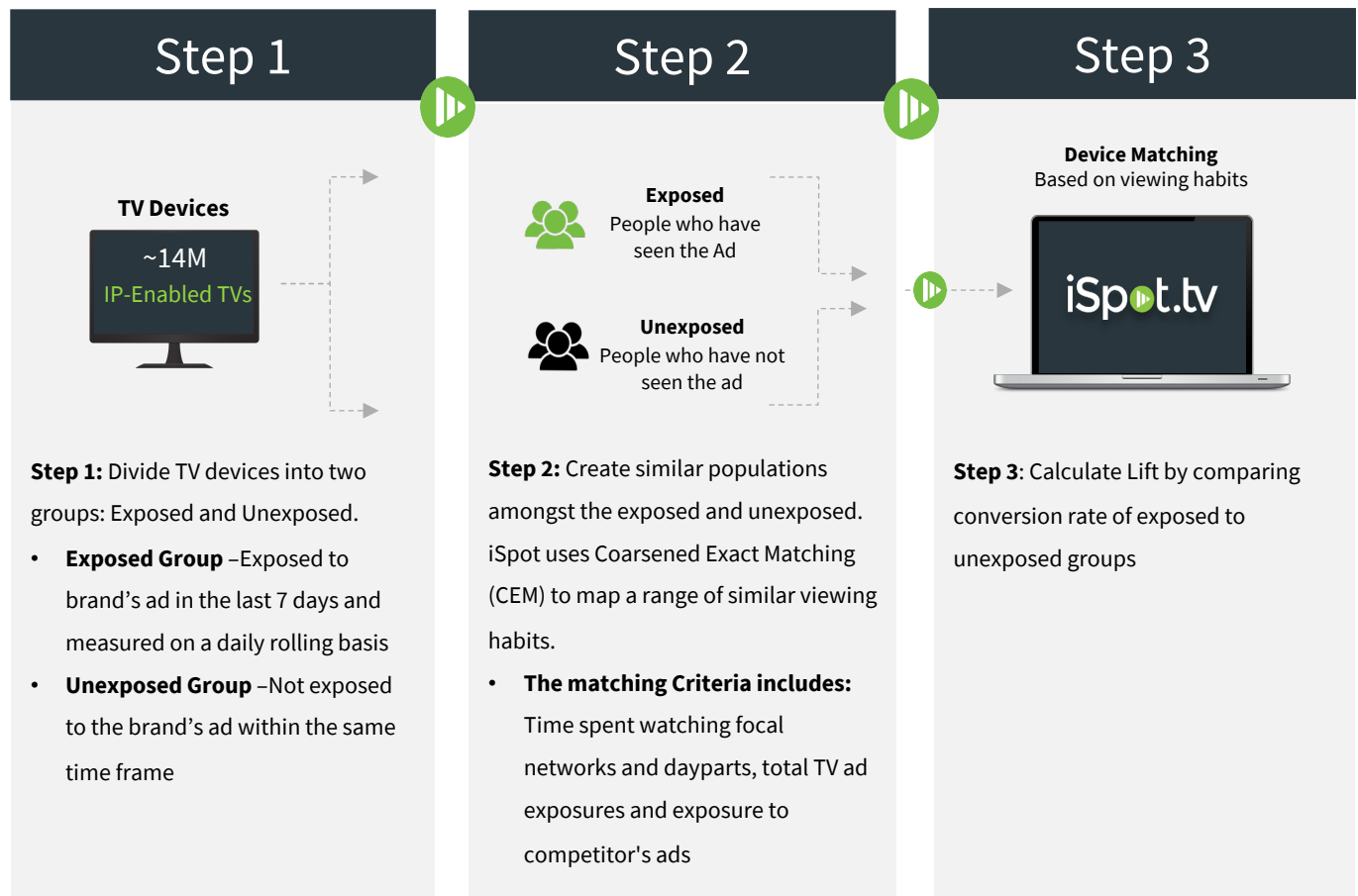
Advanced Tools

Measuring Lift

iSpot.tv **Lift Analytics** expose which media is working hardest for your TV campaign and help determine where to allocate future media spend.

Through the iSpot dashboard, you can view lift by TV overall, Network Family, individual network or daypart

- Lift estimates are calculated using weighted logistic regression models that estimate the likelihood of conversion from the matched exposed and unexposed groups

- Models are estimated daily based on a minimum threshold of at least 4,000 exposed and 4,000 unexposed devices.

- We must see at least 100 total converting devices within our matched samples, and, of these, there must be at least 15 converting devices within both the exposed and unexposed samples. Only days that meet this minimum will be included.

Step 1

TV Devices

~14M
IP-Enabled TVs

Step 1: Divide TV devices into two groups: Exposed and Unexposed.

- **Exposed Group** –Exposed to brand's ad in the last 7 days and measured on a daily rolling basis
- **Unexposed Group** –Not exposed to the brand's ad within the same time frame

Step 2

Exposed
People who have seen the Ad

Unexposed
People who have not seen the ad

Step 2: Create similar populations amongst the exposed and unexposed. iSpot uses Coarsened Exact Matching (CEM) to map a range of similar viewing habits.

- **The matching Criteria includes:** Time spent watching focal networks and dayparts, total TV ad exposures and exposure to competitor's ads

Step 3

Device Matching
Based on viewing habits

iSpot.tv

Step 3: Calculate Lift by comparing conversion rate of exposed to unexposed groups

Frequency

The **optimal frequency** helps discover the balance between impressions and conversions. It is determined by finding the point of diminishing returns, which is determined by the frequency in which new conversions represent less than 2% of the total conversions.
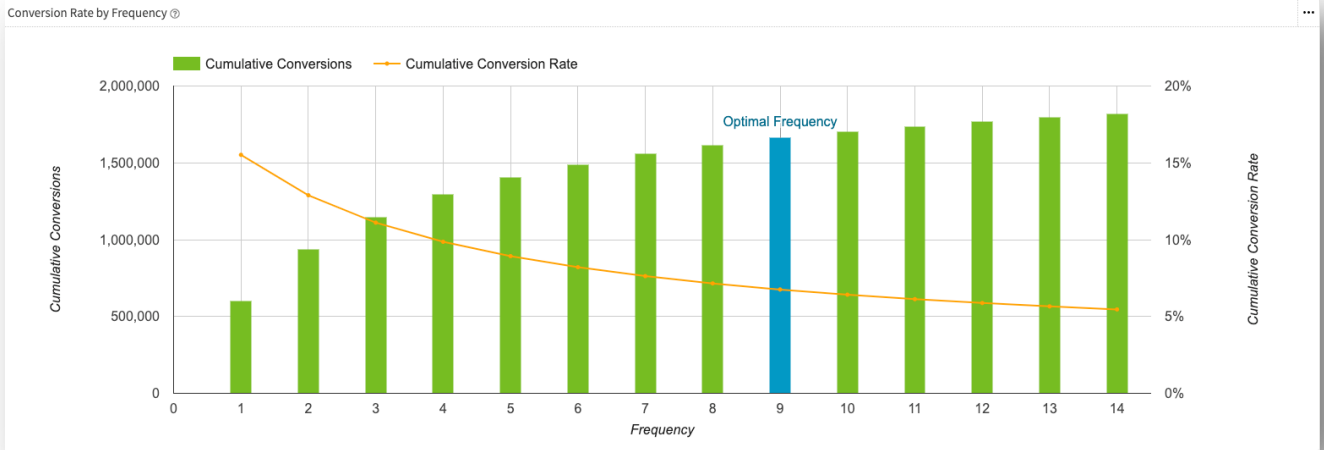

Figure 7: View of the Frequency report within the TV Conversion module

$$Cumulative\ Conversion\ Rate = \frac{Cumulative\ Conversions}{Cumulative\ impressions} * 100$$

Default time range is 90 days with a 30-day attribution window

Two options to view frequency: Overview (brand level) or by Individual Creative

Media Recommendations

The iSpot dashboard provides data driven recommendations to reach additional viewers who are likely to convert. Looking at the concentration of viewership among the brands converting audience (defined as a website visit) as compared to the general TV viewing population, we generate proprietary viewing index. We take the matched population of devices for an individual brand and compare what they watch versus what the total iSpot population watches. We use this data to then compute a **site visitor index**.

Figure 8: View of Media Recommendation report within the TV Conversion module

1 The recommendation index is between 0 and 200. The **average** is 100.

2 The closer to 0, the less popular a show is within a brand's site visitors.

3 The closer to 200, the more popular a show is within the brand's site visitors.

4 Default range is last 90 days

5 Our media recommendations are based on this viewing index along your current TV buy.

6 Media recommendations can be displayed by Show or Daypart.

Extrapolation Methodology

Extrapolated Conversions

iSpot provides extrapolated and demographically balanced impressions and conversions in order to measure the impact of your total U.S. TV investment on your business. This allows you to easily answer the most important questions - How many impressions did my ad deliver across the U.S, and how many actions were driven by my ad in total across the U.S?
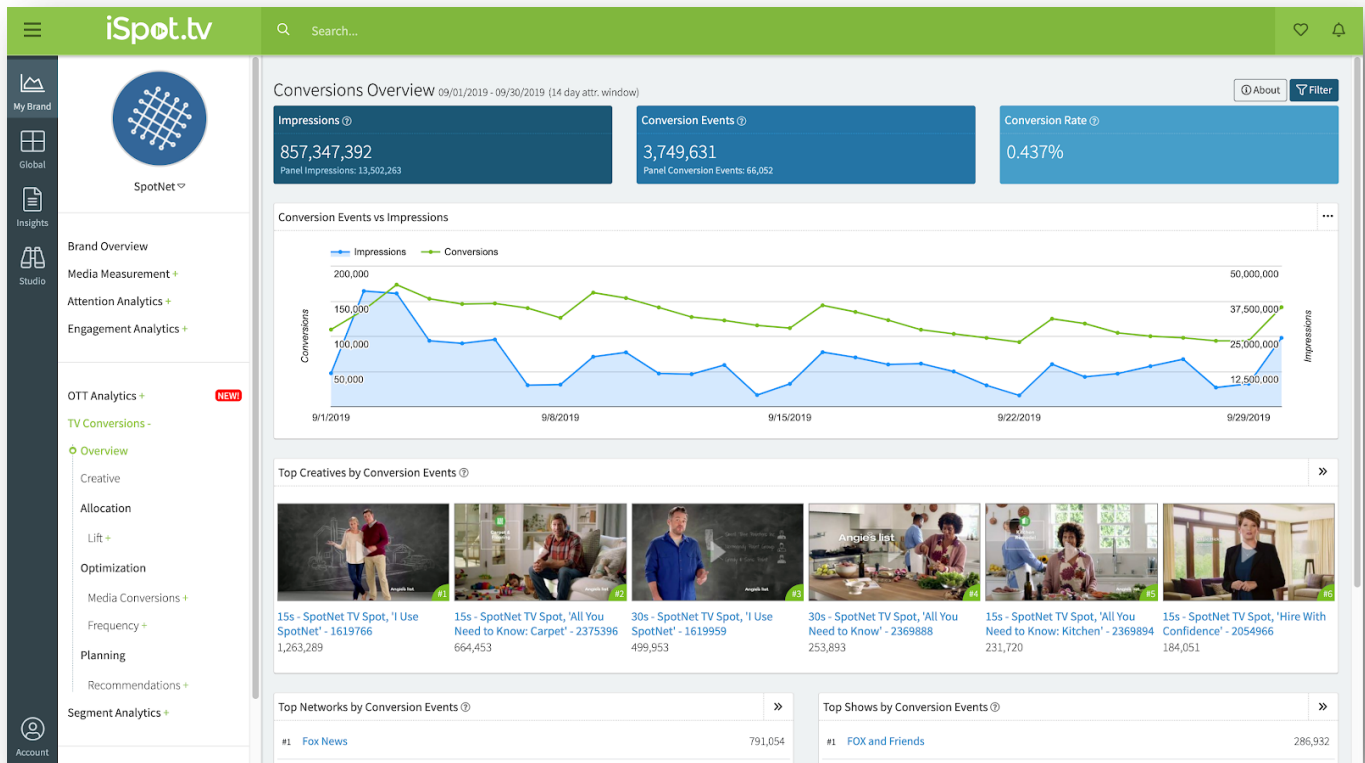

Figure 1: The **TV Conversions** Overview report in the iSpot Analytics Dashboard

How extrapolation applies to TV Conversions

Impressions

iSpot measures linear TV impressions using a panel of ~14M Smart TVs extrapolated to the total US viewing population and balanced against US Census demographics. This has been in place for all our customers since 2015 within the iSpot Media Measurement product. We simply represent extrapolated impressions within the TV Conversions Analytics. For more details, see our [Media Measurement](#) Methodology.

Conversion Events

Conversions are extrapolated and demographically balanced uniquely for every brand, for every conversion type, and calculated daily. Balancing for each brand is based on how that specific brand matches the iSpot TV Panel and how the iSpot TV panel matches to the US population.

Conversion Rate

The extrapolation does not affect the conversion rate formula, which is conversion events divided by impressions.

How we extrapolate TV Conversions

To accurately extrapolate each brand's TV conversions, we look at the ratio of Total Valid Events (events occurring on non-black listed devices) that we receive, to Matched Events within our iSpot TV Panel for the reporting period and attribution window. We then multiply that ratio by the Conversion Events that are matched to an Impression delivered by our panel. However, demographic skews in both the iSpot TV panel and the client's audience may result in an over- or under-estimate of these extrapolated conversion events if we don't take it one step further.

To adjust for these skews, we take the uniqueness of each brand into account when scaling that brand's activity up to the national level. iSpot has developed a demographic balancing factor based on how well the client's audience matches into our panel and how our panel matches the US Household population.

iSpot.tv

The iSpot Extrapolated Conversions Equation:

$$\left(\frac{Total\ Valid\ Events}{Matched\ Events\ x\ Demo\ Balance} \right) \times Panel\ Conversion\ Events$$

One key reason demographic balancing is so important is due to meaningful differences in the people who complete different conversion actions for different brands. For instance, consumers who buy an item on a mobile app may be substantially different (i.e. may skew younger) than consumers who visit the store and complete a POS transaction. Since the goal is to adjust for demographic skews, it's important to take the differences between conversion types and brands into account and to recalculate daily.

Example

Below is an example of how we extrapolate conversions for a brand while accurately balancing conversion events based on unique demographic skews:

Metrics	Brand A
Total Valid Events	100,000
Matched Events	15,000
Panel Conversions	1,000

For Brand A, 15% of their Total Valid Events matched into our iSpot panel. After determining this ratio, it becomes vital to calculate Brand A's demographic balancing factor and apply it to their Matched Events.

We do this to account for skews between our iSpot panel and the brand's, relative to the US household population. We calculate this uniquely for all our customers, for every conversion type and for every date range.

We apply this unique Demographic Balancing Factor to Brand A's matched events so that when extrapolation occurs, it is representative and accurately weighted.

Brand A's Unique Demographic Balancing Factor
.29

We then multiply the number of in-panel conversions by the ratio below to estimate the number of extrapolated conversions.

$$\left(\frac{Total\ Valid\ Events}{Matched\ Events\ x\ Demo\ Balance} \right)$$

Finally, when applying the complete iSpot extrapolated conversion equation to Brand A's data, their specific calculation becomes:

Brand A's Equation
$Extrapolated\ Conversions = \left(\frac{100,000}{(15,000 \times .29)} \right) \times 1,000$

This results in an accurate extrapolation representing Brand A's activity at the national level.

Note: numbers utilized in above equation are pulled from the chart on previous page.

Brand A's Extrapolated Conversions
22,727

This is a
22.7x
extrapolation

How to interpret the balancing factor

A lower adjustment value indicates our panel and the client's audience

demographically skew in similar ways.

A larger adjustment value means that our panel and a client's audience demographically skew in contrasting directions.

In the example above, Brand A has a demographic balancing factor of .29, signifying that their audience and our panel skew in very similar ways.

Blacklisted Devices

To ensure the quality (consumers actively watching TV that are exposed to ads) of the devices used in the iSpot population, on-a-daily-basis, iSpot removes devices from the population.

If there are over 5 TVs associated to an IP (these tend to be bars, hotels, business etc.) we remove those devices from our population. In addition if we see over 10 digital devices (these tend to be Wi-Fi hotspots, mobile data etc.) associated to an IP we remove those devices as well from the population. This evaluation is performed daily.

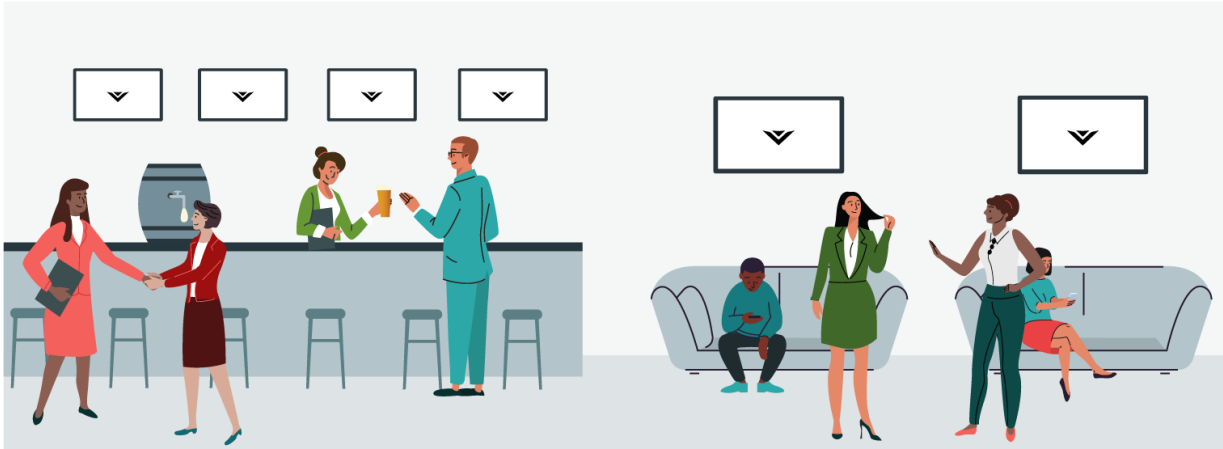**Qualifying Devices: Smart home with several Wi-Fi enabled devices**
A home with a two VIZIOs, two cell phones, two computers, a Kindle and a Nest would be included in daily population.

This home has 7 Wi-Fi enabled devices, both VIZIO TVs are used in the daily population because the home does not exceed 10 digital devices connected to a single IP address. The Nest does not count towards the 10 digital devices since it does not report conversions. Smart home devices that are connected to the Wi-Fi are not part of the digital device count.

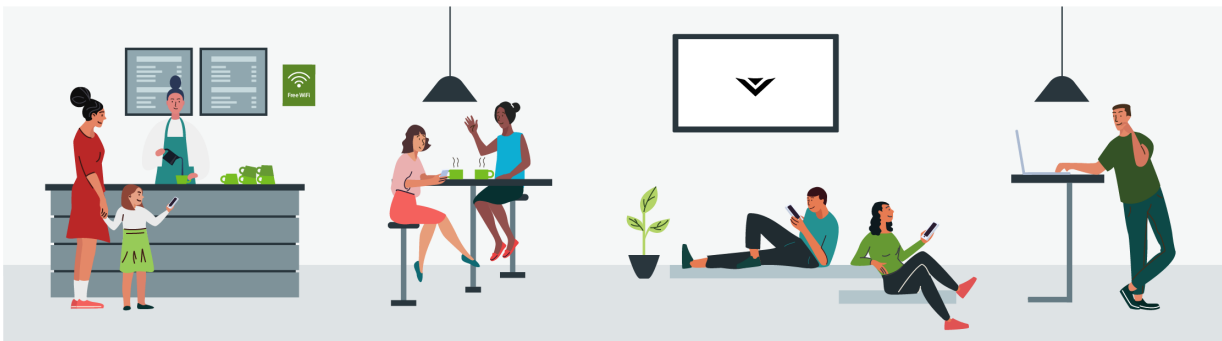## Blacklisted Device: Too many VIZIO TVs connected to single Wi-Fi
Situations like this tend to be bars or hotel lobby's where multiple VIZIO TVs are in the same space and connected to the same Wi-Fi.

In this situation none of the VIZIO TVs would be included since there are more than five connected to the same Wi-Fi.

Blacklisted Devices: Too many devices connected to a single Wi-Fi
Situations like this tend to be coffee shops or airports where there is a single VIZIO TV and multiple people in the surrounding area. The Wi-Fi then exceeds 10 digital devices.

The one VIZIO TV would not be utilized in the daily population since there are more than 10 digital devices connected to a single Wi-Fi.

iSpot Smart TV Population VIZIO

Smart TV Data

Our Smart TV Data is supplied by VIZIO, one of the leading smart TV manufacturers.

About VIZIO

VIZIO is a smart TV (IP enabled) manufacturer

Utilizes **Automatic Content Recognition** (ACR) technology to capture creatives on screen

ACR is an identification technology used to recognize content played on a media device or present in a media file

Market Share

~35% of the market

TV Population

~14 Million + devices

iSpot Smart TV Privacy Policy