

WHY PROGRAMMATIC ADVERTISING NEEDS DEVICE INTELLIGENCE

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HOW THE ADVERTISING ECOSYSTEM
IS CREATING ADDITIONAL VALUE WITH
ACCURATE DEVICE DATA

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INTRODUCTION

This paper aims to show how device detection is used by companies in the advertising technology sector to deal with an increasing fragmentation in the world of mobile devices. We also aim to discuss the RTB spec, where devices fit into it, and how DSPs and SSPs can make use of device data.

It is interesting to note that the fragmentation problem offers opportunity to those who wish to tackle it by implementing an accurate, high-performance device detection solution. A ZenithMedia report estimated global mobile advertising spend was \$96 billion in 2017, and is projected to rise to over \$150 billion in 2019. More and more ad dollars are now spent on highly targeted campaigns that reach the right people at the right time.

The goal is to ensure that all creative material works on all devices, with accurate targeting, reporting and measurement. Produce better, more targeted ads and you have the vital required edge over your competition.

HOW MANY DEVICES ARE OUT THERE?

There are now more mobile devices than people on earth. As of March 2018, there are an estimated 7.6 billion people in the world. According to Cisco, "Smartphones will account for 33 percent of total IP traffic in 2021, up from 13 percent in 2016." and the rate of growth is increasing. From the same study, "the number of devices connected to IP networks will be three times as high as the global population in 2021."

DIVERSITY OF DEVICES

Is there device diversity, or are two or three brands dominating the landscape? Fragmentation in the mobile world is actually extremely difficult to measure properly with a great deal of web-enabled mobile devices available on the market.

To understand the scope of device fragmentation, we can take a closer look at the world of User-Agent (UA) strings which are used to identify devices accessing content. As DeviceAtlas reports, there are nearly 30 different versions of Samsung Galaxy S8 and each of them has a different User-Agent. Each of these UAs identifying an S8 may come with endless variations changing according to the OS, OS version, browser, rendering engine, etc.

What is a User-Agent?

The User-Agent (UA) string is the default way for the browser (and the device) to introduce itself when requesting content from the web server. This is the purpose of UAs as defined in the HTTP standard.

The trouble is that UA strings aren't consistent in terms of their structure. They contain a lot of keywords, many of which are not related to the browser or the device. Browser makers include them just to make sure that the user is not blocked from accessing certain websites, which was a common practice in the 1990s. For example, most UA strings start with the word "Mozilla" even though they have nothing to do with Mozilla's browser. The world of User-Agent strings is still the "wild west."

As a consequence, the device and browser information contained in a User-Agent often isn't correct for the requesting device. Therefore you need to look for a device detection solution that is sophisticated enough to handle deliberate masquerades and other similar situations where a UA is not what it seems.

Device fragmentation is on the rise

DeviceAtlas' global device data shows there are over 33,000 unique web-enabled devices across the globe. DeviceAtlas lists over 2,200 different manufacturers. There are close to 3,000 devices made by Samsung, and over 1,000 devices made by LG and Huawei. How many of these devices are actually used? To give you an idea, in 2016, in the USA alone, there were 281 different mobile device manufacturers whose devices were used for web browsing in that period! The fact that any company can now design, manufacture and sell a smartphone, means that it's becoming increasingly difficult to serve content that fits and matches screen size and device capabilities properly.

THE MOBILE ADVERTISING INDUSTRY

What is the future of advertising technology in relation to mobile devices? Mobile ad spend is catching up with the time consumers are spending on their devices both on apps and web browsing, topping \$140 billion in 2017. That report predicts that programmatic mobile video advertising will bring the next big wave of investment and spending which also leads to new problems. Which devices can support such advertising? Will customers be happy to spend on the data bandwidth required to display them over and over, or will they install ad blockers?

TARGETING, MEASUREMENT, AND REPORTING

According to a study by Forbes Insights and Quantcast, over 50% of companies surveyed spend more than half of their ad budgets on targeted campaigns and 84% expect budgets on targeting to increase in the near future. **Half the companies don't just allocate budgets on targeting ads but also check that their campaigns actually reach the targeted audience.** The most common ways of validation include customer surveys and third-party validation services, such as comScore or Nielsen Digital Ad Ratings. The fact that a lot of brands have an excellent understanding of how targeting works means that more accurate and granular targeting and reporting techniques are required to stay on top in the ad tech business.

The answer to the big advertising technology conundrum is threefold:

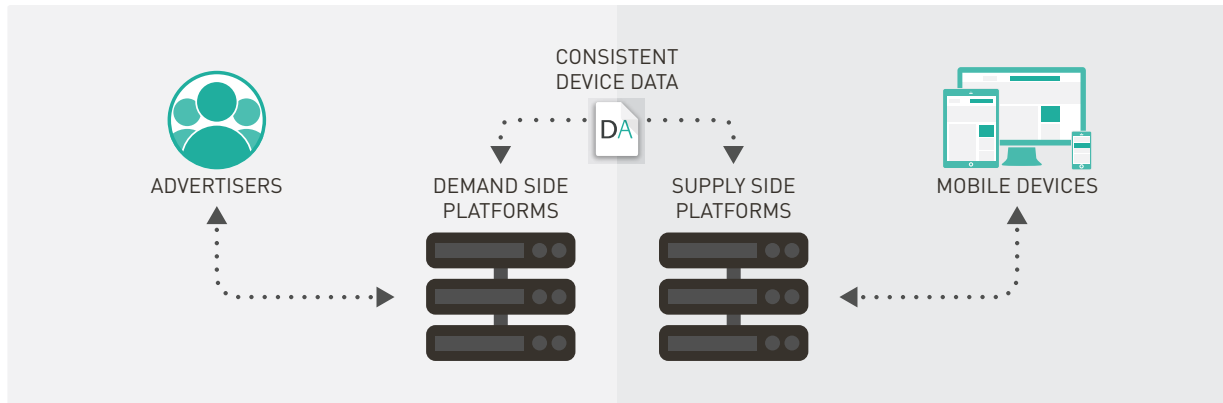
- **Targeting**—The majority of ad budgets are now spent on carefully targeted rather than wide-reaching campaigns intended for anyone. It is now extremely important to ensure appropriate ad content reaches appropriate users. Device detection is an essential ingredient to make this possible. It's also a technical issue due to different screen sizes, screen resolutions, hardware capabilities, and connectivity levels. It's important to know what type of device is being served, so it can be served correctly.
- **Measurement**—Different players across the advertising sector have different data requirements. But all have a similar goal: to measure traffic as accurately as possible. Device analytics is becoming more important as diversity increases.
- **Reporting**—Consistent and accurate device data is essential to reduce discrepancies between various parts of the ad tech puzzle. Granular and accurate reporting offers more value for the marketers purchasing ads, as well as making sure that publishers get maximum value of their inventory.

DEVICE DATA AND THE RTB SPEC

The RTB spec as defined by the IAB provides a framework for Real Time Bidding (RTB) by which advertisers, publishers, exchanges, ad platforms and consumers interact. The IAB state "The mission of the OpenRTB project is to spur greater growth in the RTB marketplace by providing open industry standards for communication between buyers of advertising and sellers of publisher inventory."

As part of the RTB spec, there are lists of bid request object specifications. An exchange or other supply source sends a bid request to bidders. Bid requests contain the top-level bid request object (BidRequest) and one Imp request which shows what type of impression the bid request is (e.g. Banner, Video, etc.).

However, there are lots of optional objects specified too. **The more information available on the bid request, the higher the potential to maximize bid value, since there are fewer unknowns.** More details also mean that more DSPs in general will take part in bidding, since the request can match more campaigns. In an industry categorised by small edges in performance meaning large dollar rewards, every advantage is crucial.

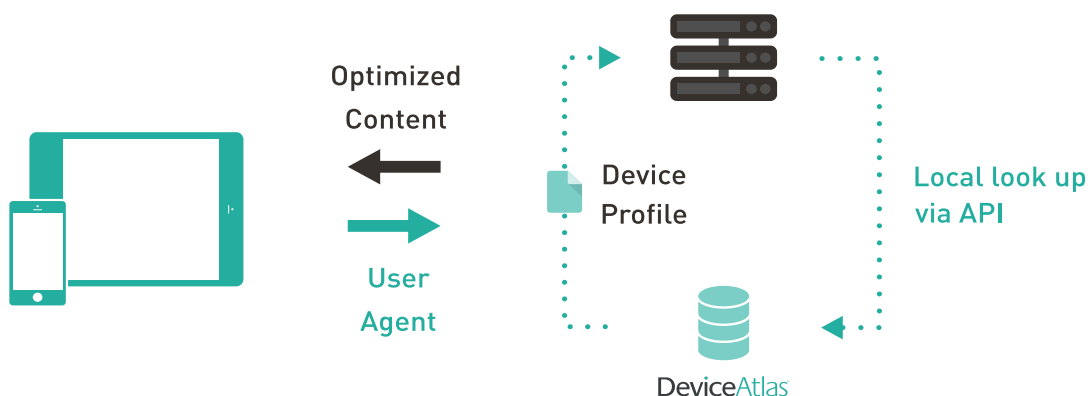


Typical deployment in the RTB ecosystem

Section 3.2.11 of the RTB spec (p19), displays the Object: Device specification. The IAB states that there are no open source device lists including properties like make, model, operating system, carrier etc. So who do you turn to?

ACCURATE DEVICE DETECTION

DeviceAtlas is the world's leading device detection solution. It's used across the web, telco, digital marketing and advertising sectors. The technology provides a common device identifier to understand device traffic across all connected environments, even within apps. The following diagram shows how DeviceAtlas can be deployed locally in order to take advantage of the highest speeds available.



A locally-deployed device detection solution

DEMAND SIDE PLATFORM

A demand-side platform (DSP) is used by advertisers and advertising agencies to automatically purchase ads in real-time (display, video, mobile etc.). Advertisers are able to buy impressions across a range of sites. These impressions can be targeted to specific users, depending on who the advertiser wants to target (based on location, device used, previous browsing behaviour, etc.).

DSPs are used by marketers to buy ad impressions as fast and cheaply as possible. A DSP will bid for each available ad which is offered at an ad marketplace called an 'ad exchange,' if it fits a campaign set up by one of its advertiser customers. DSPs incorporate much of what ad networks have offered, but centralise the process. Some ad networks are now becoming more like DSPs as the market evolves.

How Rocket Fuel use device data

Rocket Fuel is a major DSP which receives over 120 billion bid requests per day originating from all kinds of web-enabled devices. DeviceAtlas' device identification capability makes it possible for Rocket Fuel to fully understand the characteristics of all devices generating ad requests. According to Rajaraman Periasamy, Principal Product Manager at Rocket Fuel:



"In all scenarios, we want to know the context of the user in as much detail as possible. All bid requests we receive include User-Agent strings which we can understand thanks to DeviceAtlas. Our customers require narrow targeting and DeviceAtlas allows that narrow targeting."

Typical DSP-focused use cases for device data

Campaign management

Population of campaign management interface used by advertisers to define campaign and enrich the targeting options with various device properties.

Populating data from external sources

Enrichment of bid request in the event that the exchange does not populate all fields due the lack of device data (common problem for exchanges which don't use a device detection solution).

Device information beyond the scope defined by the RTB protocol

Adding extended device information beyond the scope defined by the RTB protocol to enable more sophisticated targeting by advertisers.

Data Management Platform (DMP)

Population of user profile fields stored at the DMP level. Its purpose: to store user profiles, and track device information against the user profile. This is matched against bid requests from the exchange, since the bid request carries the User-Agent string.

Selecting the right creative for the device

If the DSP includes an ad server, a device detection solution can be used to identify the optimum size of creative according to the device characteristics to make sure it displays well on the target device (within the bounds of the ad format mandated by the bid request).

Consistency in device naming

Enrichment of reporting to the advertiser to show consumer-friendly device naming, for example grouping all Galaxy S5 models into one bucket (each variation of a phone comes with a whole set of User-Agent strings).

SUPPLY SIDE PLATFORM

Advertisers use DSPs to buy inventory. Publishers use SSPs (Supply Side Platforms) to sell inventory. Designed by the sell side of the advertising ecosystem, they allow publishers to show their inventory a wide variety of ad exchanges. **Their job is to maximize fill rate so that the amount of empty ad space is as minimal as possible.** An SSP will help a publisher control how they sell each impression, maximize their advertising revenues by reaching as many bidders as possible, and better manage their inventory. This bidding process can take place in a matter of milliseconds. Major companies offering an SSP platform include OpenX, PubMatic, AppNexus, etc.

AppNexus helps the world's top publishers monetize their content through integrated ad serving and programmatic selling solutions. Using a device detection solution provided by DeviceAtlas, AppNexus enrich bid requests with information about the impression, so that DSPs can bid more intelligently on it.

Typical SSP-focused use cases for device data

Reduce discrepancies

Provide reporting to publishers including a device identifier which permits alignment with the publisher's own web analytics reporting. Consistent device data used in this way helps reduce discrepancies between different sources of campaign reporting.

Maximize fill rate for publisher's inventory

Population of all device-related and carrier-related fields in bid requests to maximize the chance of matching campaign targeting criteria.

CONSISTENT DEVICE DATA

The key to a successful relationship between the advertisers and their audiences (visitors/users), or DSP and SSP, is matching data across all players. The mobile landscape is not just fragmented, it's a mess. Every smartphone has a massive number of UAs depending on which production run it's from, what browser is used, when it was last updated, etc. Even if every component is identical these devices introduce as different.

Deciphering device data is DeviceAtlas' mission. We track upwards of 6M+ unique UAs and this number is growing every day. Now SSPs and DSPs can understand who they are targeting, and allow advertisers to effectively target even deeper. Consistent device data has eluded advertising players for many years but now that mobile devices are ubiquitous, there is no excuse for ignoring the targeting and reporting potential.

SPEED OF DETECTION

Speed is the final piece of the ad-tech puzzle. It's not just enough to be able to identify devices. DSPs can choose which devices they wish to target, and SSPs can sell the ability to target those devices, but communication between the two and the user must be in the region of milliseconds.

DeviceAtlas allows device recognition (without caching, using C++, multi-threaded) from 1.7 million per second on a low-end server up to 30 million detections per second on a high-end server. Combine speed like this with the most accurate data on the market, and real time bidding becomes just that, real-time. In addition, it has a very compact footprint (which is stable over time), which keeps infrastructure costs down even as the level of impressions tracked grows into the trillion per month level.

How Airpush use device data

Airpush enable app developers to monetize their apps by connecting them with advertisers who want to reach their mobile audiences. DeviceAtlas' device detection solution provides Airpush with a standardized way to report on devices (device id, standard fields, naming conventions etc.), which allows clear and consistent targeting and reporting. This means that any info specified in bid requests is properly fulfilled. Cameron V. Peebles, Chief Marketing Officer at Airpush:



"DeviceAtlas is the market leader when it comes to device detection. We are confident that the speed, accuracy and currency of device data will add value for both our developer and advertiser community."

BOTS AND CRAWLERS

Bots and crawlers may get a negative reputation but they are an important part of the online landscape. However, they are an unknown quantity in web traffic. Multiple sources, including DeviceAtlas have estimated the level of bot and crawler traffic to average websites to be around 50% of the total. What this means is that large sites and advertisers could be serving heavy images and content to bots and crawlers, when this might not be necessary. Server and bandwidth costs add up fast, and reducing these can give a player an important edge. With an accurate device detection solution, you can prioritize your real users over bots and make sure they get the best experience.

CONCLUSION

We've explained the diversity in the device landscape and the number of devices now active globally. Screen resolutions, diagonal sizes, pixel densities, connection types, connection speeds, browser capabilities all contribute to how and if an ad is displayed to a user. Today an accurate device detection solution is crucial to make sure that DSPs and SSPs talk the same language, to reduce discrepancies in reporting, maximize fill rate, and allow granular device targeting. Maximizing deliverability and offering improved reporting and analytics are the next steps for the advertising technology industry.

BOOST YOUR AD TARGETING AND CAMPAIGN REPORTING WITH DEVICE DETECTION

DeviceAtlas is a high-speed, high-performance, low-server footprint device detection solution used by some of the largest companies in the advertising technology sector. Implement DeviceAtlas to:

- Dramatically improve device targeting and campaign reporting capabilities
- Reduce discrepancies in terms of device data originating from different sources
- Populate data from external sources with a consistent device information to maximize bid value
- Maximize fill rate for all ad placements based on programmatic advertising

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