XONA PARTNERS

Private Cloud for Online Ads RTB

Positioning & Proposal

Jeff Gilbert
Dr. Riad Hartani (Xona Partners)
Dr. Muthu Muthukrishnan
Dr. James Shanahan (Xona Partners)

November 2013

Preamble

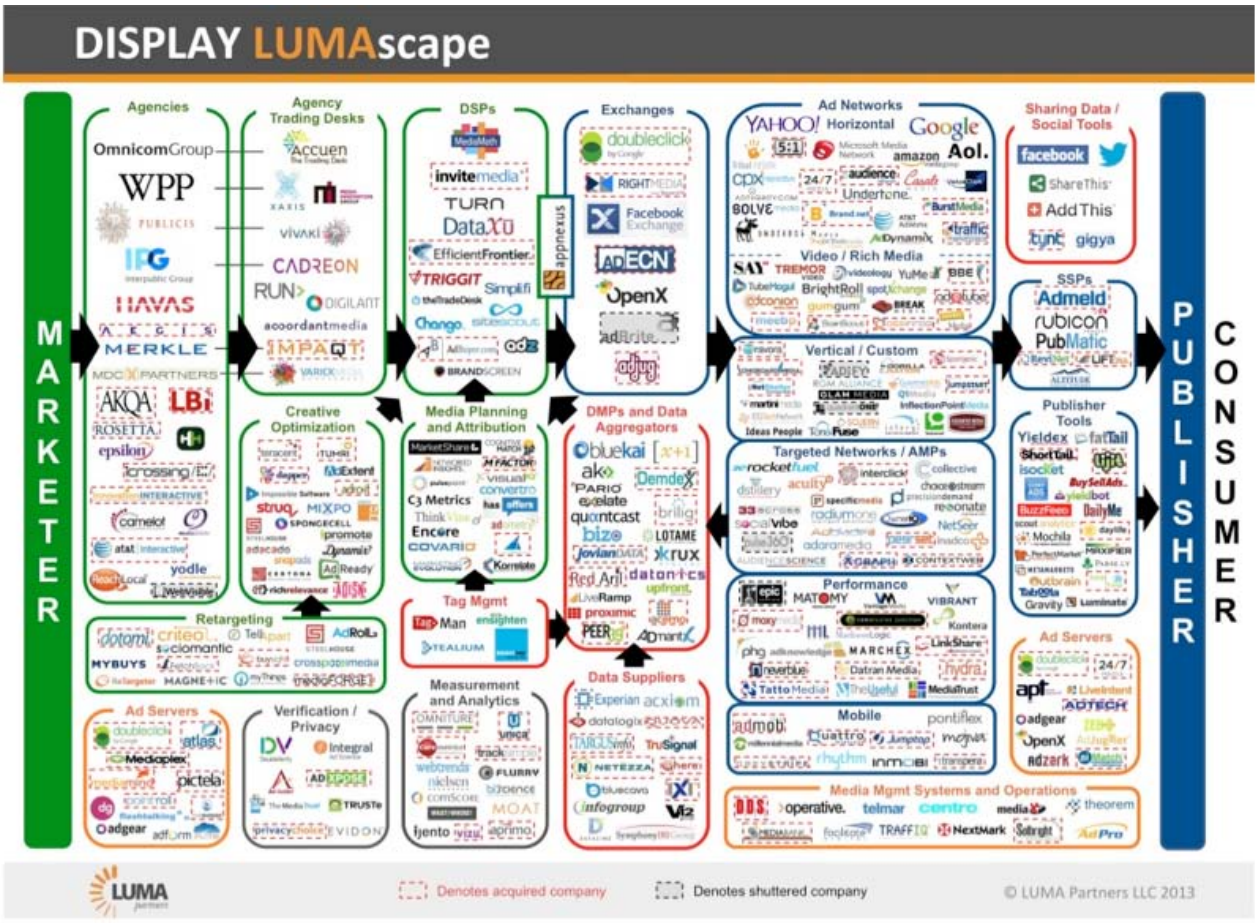
Over the last 24 months, our team has been working on developing solutions for SSPs (Sell Side Platform), DSPs (Demand Side Platforms) and DMPs (Data Management Platforms) allowing them to focus on their key competency, which is the development of effective real time bidding solutions, and providing them with turnkey software/hardware infrastructure solutions and bidding optimization platforms. Various strategic aspects have been considered, and some descriptions be found in (1), (2) and (3). The diverse expertise of the team, combining advanced knowledge of lead global Ad Exchanges, SSPs/DSPs architectures, Online Ads real time bidding strategies, Data Science algorithms, low latency data center design and optimized Internet transit/peering architectures, from both a research and application angles, allowed us to zoom in on some of the most opportunistic execution ideas that would benefit the overall Online Ads eco-system players as well as the underlying network operators and data center hosting providers' business models.

Within this solution framework, we have specifically worked on putting together detailed specifications for a dynamic hosted networking eco-system for bidding optimization, which provides direct benefits to DSPs, SSPs, DMPs, Ad Exchanges and the various players in the online advertising value chain, as well as new revenue generating services for data center hosting providers and telecom transit providers. This positioning and call-for-collaboration paper, presents the rationale, the addressed challenges, the opportunity as well as a baseline for a win-win go to market partnership

Background

The practice of placing display ads (known by the general public as "banner ads") on web pages has been around since the early days of the World Wide Web. Since then, the practice has dramatically grown and is expected to continue for the foreseeable future. ComScore estimates that roughly 5.3 trillion banner ads were served in the US in 2012 alone. Historically, display ads were purchased purely on a CPM (cost per thousand) basis, with advertisers and their agencies buying from general impression inventory of "relevant" publishers. For example, if you are looking for males 25-54, advertise on ESPN.com because that is what makes up a large portion of its visitors. This is the typical mass market approach which is used when advertising on broadcast television. The theory is that if you put your ad beside content which is more or less relevant to a certain demographic, you will obtain the best "reach" of your target. On the negative side, many of your ad impressions are wasted, because even the most targeted content will attract some amount of diversity of viewership. Your ad will simply be irrelevant to some and there is no way around that. Advertising veteran John Wannamaker is renowned for expressing this idea succinctly, "Half the money I spend on advertising is wasted; the trouble is, I don't know which half."

Unlike broadcast television, the basic functionality of the Internet gives advertisers the ability to communicate with potential customers on an individual basis. Advertisers have the ability to choose which ads to show which customers or even to choose not to show any ad to some customers. This functionality is so powerful that it has spawned an entire display advertising ecosystem.



This ecosystem has developed a set of technical approaches generally referred to as Programmatic Buying. As its name implies, Programmatic Buying relies upon computers running specialized programs to buy and place millions of ads each second. While similar to high frequency trading in the equity markets, Programmatic Buying relies far more on big data and requires communications among many different ecosystem partners for each transaction.

While programmatic buying technically includes some other elements, its primary process is called Real Time Bidding (RTB). In RTB, each ad impression is auctioned off to the highest bidding advertiser. The process is real time in that it occurs during the time a single web page is loading. It is so fast that the end user has no idea it just happened.

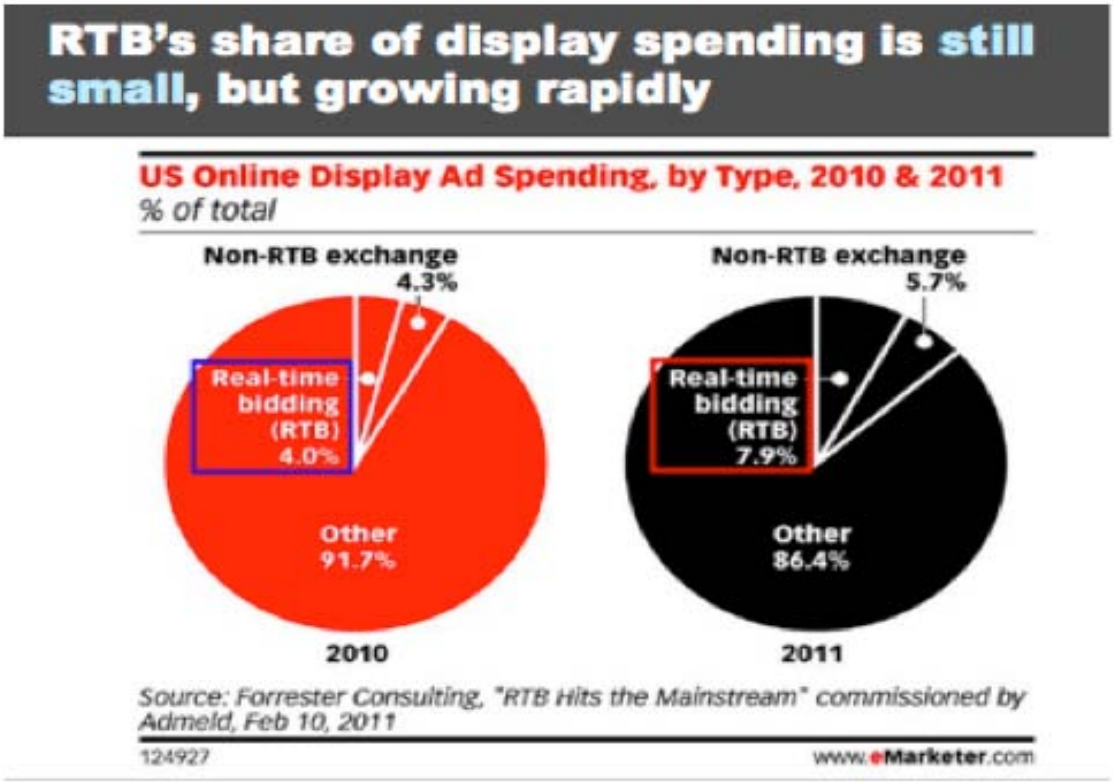
Because this process occurs independently for each ad impression, it tends to scale linearly. Twice as many decisions require twice as many communications and twice as much processing power. Decreased latency will allow more decisions and/or better decisions with the same processing power. This is the key to allow the industry to scale quickly and efficiently. As a result, there exists an opportunity to facilitate the ecosystem partner communication process by decreasing its latency.

Display Ad Industry Status/Trends

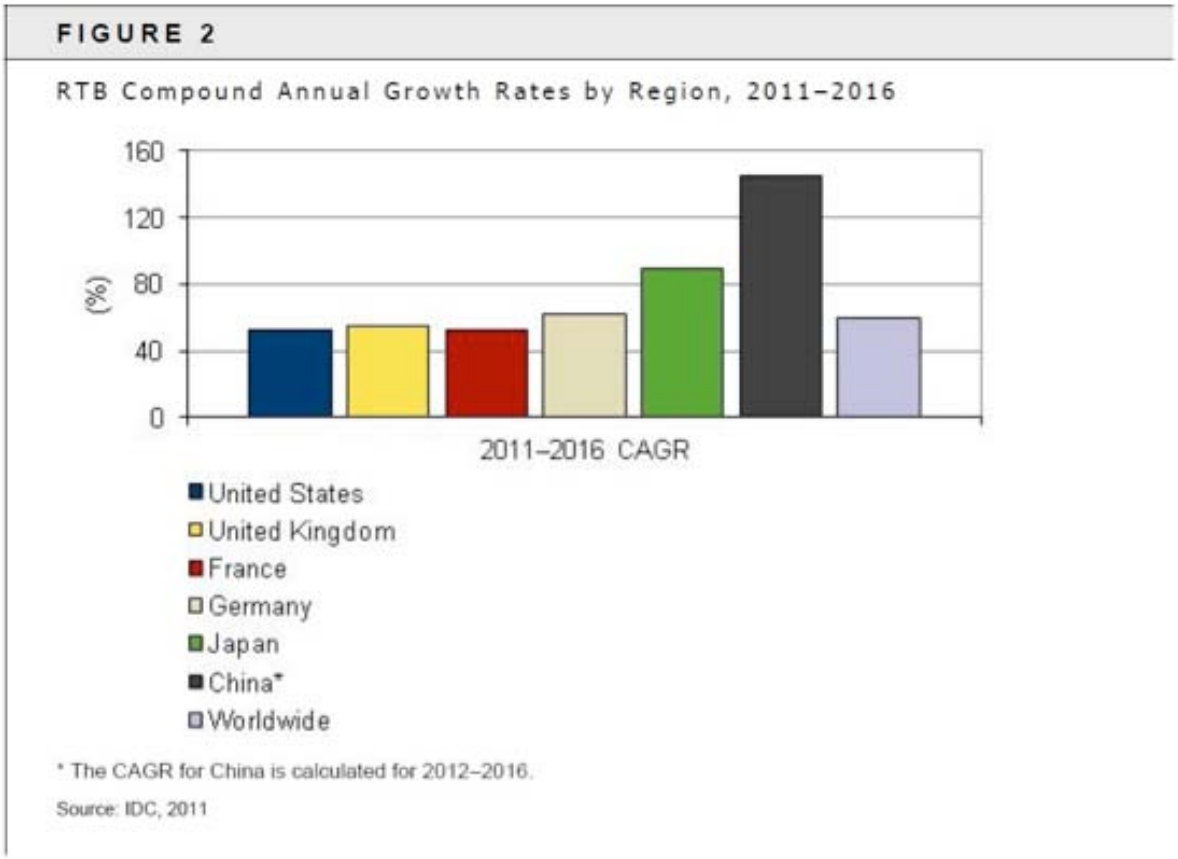
Online advertising market data are described below, showing the absolute revenue numbers and growth patterns:

Source: J.P. Morgan estimates.

The ratio of RTB versus overall online advertising, as well as growth patterns are shown below:



RTB growth rates in the online advertising market are described below:



These growth rates dwarf those of other parts of the advertising industry. Some estimates indicate that programmatic buying will ultimately account for up to 80% of the display advertising market.

How Does RTB Work

A simplistic explanation of the approach is that when a user reaches a website, the user's cookies are read by an SSP, which places up for auction, via an electronic query, a display impression to be shown to that user. The bidders, known as DSPs, use that cookie, which reveals information about that user's browsing patterns, to decide if and how much to bid for that impression. After a fixed period of time, the auction is closed, the winner declared, and the ad creative delivered. These auctions occur millions of times each second and typically last between 50 and 100 msec. As a result of limited resources, the duration of auctions is declining while their number is increasing.

Technical Challenges/Current Solutions

Currently, the ecosystem is physically decentralized. SSPs locate in data centers of their choice and DSPs, their trading partners, either follow them and establish a presence in those data centers or connect in via high speed Internet connections. While certainly open, this approach creates a tremendous amount of waste in the industry. DSPs are forced to establish multiple points of presence just to be near their trading partners and SSPs are forced to maintain excess processing power to keep auctions open long enough for far away trading partners to respond.

Not only does this approach cost ecosystem partners unnecessary capital and operating expenses, but it also reduces the value of the auctions themselves.

While much has been written about optimal auction bidding strategies, one simple truth is somewhat obvious. Increasing the number of bidders tends to increase the winning price. SSPs report that many RTB auctions currently receive only 3-5 bids before auction close, despite the fact that up to 100 DSPs were solicited. So helping DSPs respond more quickly will likely lead to higher winning bids. Increased winning bids will make RTB more attractive to publishers, thus attracting more premium inventory. This positive cycle will attract more capital, more sophisticated bidding tools, and ultimately make the industry more robust.

Latency is currently the biggest impediment to growth in programmatic buying, because it reduces the number of qualified buyers able to respond in time and increases the amount of resources necessary to keep auctions open longer. Since many RTB bidders connect via the Internet, the latency problem tends to worsen during busy Internet times (6PM – 10PM). Of course, this is also when RTB is the busiest. While some DSPs have tried to reduce latency by physically locating under the same roof as SSPs, their efforts have had little effect on the RTB environment as a whole since auction times are largely determined by the slowest bidder.

Proposed Solution

The best solution to this problem is to significantly reduce the latency of the RTB process from the Internet. This will decouple it from the latency variations of the Internet, which will allow the industry as a whole to optimize its efforts. This can be accomplished in the following hybrid approach:

1) Establish trading hubs. These are data centers which can attract a large number of ecosystem partners. These partners can connect via fiber cross connect within the facility. This will reduce inter-partner latency to sub millisecond ranges.

2) Connect these hubs with private (or virtually private) lines made available in a shared way to ecosystem participants.

3) Evolve the eco-system in a way that the more participants into it, the higher is the incentive for non-participants to join in.

The solution is similar to that utilized by Disney at its theme parks. Beneath all of their theme parks is a community of tunnels, which separates the business side of running a theme park from the customers of the theme park. No matter how busy the park is, the tunnels still operate at peak efficiency. This separation of back office and customer facing environments gives the added feature of security. As the primary revenue stream for the Internet, the buying and selling of advertising is critical for its continued success and should take place outside of an area with public access.

The solution is also similar to how financial trading hubs have evolved over the years (with our team having lead some of the most state of the art financial trading data center hosting in the world), where low latency hosted trading eco-systems have developed, incentivizing market participants, including traders, brokers, market data players and information technology players, to collocate and optimize their bidding strategies under such trading hypothesis.

The Opportunity

A private network/cloud for the buying and selling of display advertising is a natural for network effects – the more companies that join, the better the value proposition for the next company to join. As an illustration, there are currently roughly 450 DSPs and SSPs as well as hundreds of additional participants in the digital advertising ecosystem. There are also over 13,000 advertising agencies in the US, many of which have at least some connection to the world of display advertising. This is in addition to the thousands of advertisers which are becoming more directly involved with digital ad ecosystem participants. In short, there are literally thousands of companies which could ultimately choose to participate in a private advertising environment.

Those data center, cloud, and telecom providers which choose to participate in the creation of this private environment stand to gain significant customers with naturally high barriers to exit.

This is also very timely, as it fits into the various RTB eco-system players, in terms of moving forward with information technology and network transformation roadmaps, driven by their fast growing scaling, security and reliability requirements, which would help them build an optimal platform for Business Intelligence, Data Warehousing, Reliability & Availability, Performance & Scalability, Monitoring, Metrics & Diagnostics, Real-time Analytics, Data API and Governance, leveraging the proposed hosting eco-system concept.

Starting Up Proposal

Following some successful early stage, small scale validation over the last 12 months, where the value of reduced latencies and collocated online Ads eco-system players have been quantified, we are now taking this solution proposal to market in a bigger scale would require the involvement of the various players in the RTB value chain, as well as Data Center, Cloud and Telecom providers. Our proposal is to progress in phases, with a DSP, SSP, DMP, data center provider, and telecom network provider all choosing to participate in an initial validation phase. Once lead participants are identified, a test environment will be created and ad buying/selling can begin. The nature of the selling and buying technology is such that it can easily plug into a private environment without harming the existing public environment. We believe that the online ads RTB eco-system will be evolving in the direction we have been highlighting, and hence, encourage various players to speed up such evolution, for the common interest of the various eco-system players in the online Ads value chain.

Select Team References

(1) Muthu Muthukrishnan "Ad Exchanges: Research Issues", http://algo.research.googlepages.com/start2.pdf

(2) James Shanahan "Data Science as a Service: The Present and the Future", Keynote talk, Mine Analytics 2013, Minneapolis, MN http://mediasite.csom.umn.edu/Mediasite/Play/bb3c8bb3a1804ef7a52fb4590077a1181d?catalog=9acfe417-9ead-4a1e-8707-d35d315afd66

(3) Riad Hartani "Low latency Data Center Hosting for Online Ads Eco-system – Analogies between Financial Trading and Online Ads Real Time Bidding Infrastructure", Internal Report (to be available soon).

Contact and Further Discussions

For more information, contact any of our team members: Riad (riad@xonapartners.com), Jeff (jeff@jeffgilbert.com), James (james@xonapartners.com) or Muthu (smewtoo@gmail.com). Pleasure to meet up for further discussions in the Silicon Valley area or any of our global locations.

Xona Partners (Xona) is a boutique advisory services firm specialized in technology, media and telecommunications. Xona was founded in 2012 by a team of seasoned technologists and startup founders, managing directors in global ventures, and investment advisors. Drawing on its founders' cross functional expertise, Xona offers a unique multi-disciplinary integrative technology and investment advisory service to private equity and venture funds, technology corporations, as well as regulators and public sector organizations. We help our clients in pre-investment due diligence, post investment life-cycle management, and strategic technology management to develop new sources of revenue. The firm operates out of four regional hubs which include San Francisco, Paris, Dubai, and Singapore.

Xona Partners

www.xonapartners.com

advisors@xonapartners.com