Jedi++
Header Bidding response options

October 27, 2016

PTX0401

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Executive summary

Goal for today
- Present options for mitigating header bidding infrastructure across buy and sell
- Options for discussion are very aggressive, but not the most radical possible

Summary
- **(15min, 2 slides)** Level setting -- three types of HB pose a threat to inventory access
- **(45min, 3 slides)** Two tracks for response
  - **1) Make Exchange Bidding more competitive versus HB**
  - **2) Compete more aggressively with other exchanges (DRX and Buyside changes)**
- **(time permitting, 1 slide)** Is this enough? More radical options?

Level-setting (15min)

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Three types of Header Bidding transactions, current weak responses to types 2 and 3

|	(1) Remarketing/Big Buyer	(2) Auction Pressure	(3) Deals (new since last time)
Use Case	High-CPM / low fill buyers see 100% of publisher queries	Multiple exchanges compete on per query pricing to help increase publisher yield.	Run guaranteed and non-guaranteed programmatic deals that compete at any DFP priority, any custom format
Value Prop	Buyers: Increased match rate, increased user exposure, increased win rate. Pubs: yield	Increased match rate/user exposure, up to 50% yield increase (likely self-pricing)	Deals with buy-side decisioning, direct pub payment, fee transparency
Drawbacks	Users/pubs: Latency, reduced auction pressure, value to buyer not transparent	Pub: Latency, operations, non-transparent payout, AdX last look	Pub: Latency, limited forecasting Buyer: limited distribution
Users	Criteo, Amazon, FB	OpenX, Rubicon, Index, Pubmatic, Sonobi	Omnicom, Merkle, Publicis (working through other SSPs+DSPs)
DRX offering	DFL is growing fast for Criteo & smaller buyers (data) BUT **Red** for Amazon & FAN who have strategic+trust issues	Exchange Bidding is still beta, publishers are excited but big exchanges are resistant for strategic+financial reasons (data)	DFP doesn't have PNG (programmatic non-guaranteed) Deals yet, and DBM+AdX won't let agencies/buyers pay publishers directly.

New threat: Amazon's third-party exchange bidding could become the new ad server
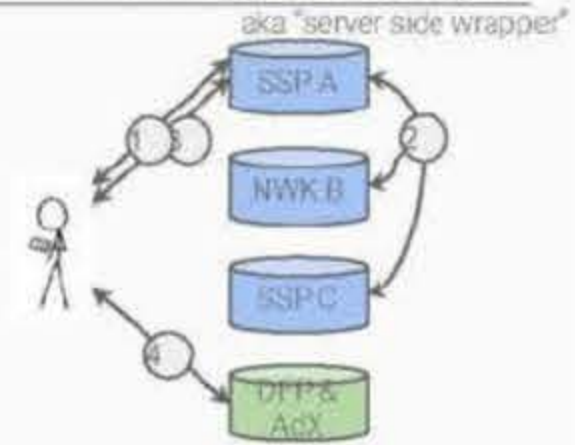
Basic header bidding
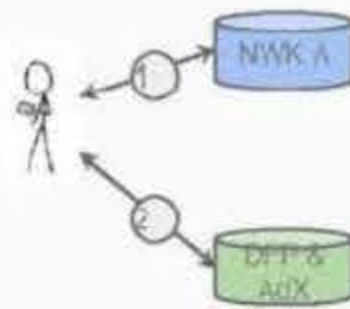
Pro: simple to work with one partner

Con: separate code per SSP, latency, passbacks

Client-side wrapper
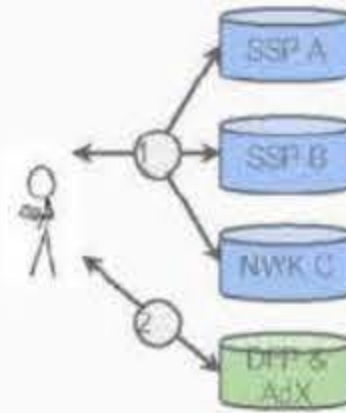
Pro: easily add several SSPs, open source

Con: heavy on the client, latency

3P Exchange bidding
aka "server side wrapper"

Pro: add demand partners without latency, log all events

Con: cookie matching

- Amazon is launching exchange bidding starting with 1c serving fee, no revshare, direct billing & no rules
- Facebook has agreed to at least buy through client-side wrappers

Options: Two Tracks (45min)

1) Make exchange bidding more competitive versus HB
2) Compete more aggressively with other exchanges (DRX and Buyside changes)

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1) Make Exchange Bidding more competitive (we can pick one option)

	1. EB++ (More Features faster)	2. Open Jedi (Different biz model)
Description	- PG & PNG support to address Type 3 HB - Creative verification enhancements - Pub controls (Floors & Rules) - AdX gives up last look	- Allow SSPs to buy without a pub contract with Jedi fees - Allow buyers (FB, AMZN, Criteo, GDN, etc) into Jedi directly - Allow buyer direct billing
Pros	- Better than HB, seen as fairer (last look) - Strengthen DFP "must call" status with BI	- Seen as most open by exchanges, increases demand we aggregate
Cons	- Major investment - Still not seen as fair & open - Won't win FAN/Amazon - Loss of revenue (last look)	- Huge investment - Won't win FAN/Amazon - Loss of margin - ADX collapses - Props up exchanges (they get all DFP inventory)
Next steps if we do it	**Develop resourcing plan and timeline from Q1+**	**Develop resourcing plan and timeline from Q1+**
	NOT Recommended	**NOT Recommended**

Recommendation: do neither, just continue developing existing EB roadmap

	3. Lower AdX revshare	4. Accelerate Deals	5. Full bid landscape
Description	Reduce open auction revshare from 15-20% to 9-14% - lower rates for high CPM (eg DFL)	Anything possible with DFP tags should be possible with programmatic buyers (PG and PNG) Buyer's choice	Share all bid data with publishers including GDN, DBM, and AdX buyers
Pros	- Price-competitive with other exchanges - Reduces financial benefit of HB and ADX/Jedi gap	- Make "DSP-into-DFP" superior to "DSP-to-SSP-to-HB-to-DFP" - Convert tag deals to revshare	- Market parity with every other exchange (who offer no-opt outs) - Returns trust in AdX
Cons	- DBM probably can't raise rates to compensate - AdX buyers more competitive against Google	Pubs could hurt themselves and Google by doing bad deals (but they're doing this anyway with HB deals)	GDN could be gamed given bernanke Downstream negative impact
Next steps if we do it	**Build a financial model with intent to change price in Q1**	**Eng plan to accelerate PG GA and PNG Beta+GA**	**Experiment in Q4 with goal to roll out in 1H 2017**
	Recommended	Recommended	NOT Recommended

Recommendation: do #3 and #4, wait and see on #5

2 (part 2) - compete more aggressively with other exchanges - buyside changes

(options could be pursued in parallel)

	6. Prevent self-flooring	7. Payout transparency
Description	- Implement OriginId via **TAG** and publicize - DBM and AwBid **do not buy ANY HB queries**, only buy from origin servers (in effect prefers AdX on DFP sourced queries) - DBM and AwBid ask all exchanges to implement this	- DBM leads industry push to disclose what buyers are paying SSPs to publishers, so they can see what the true revenue share is - Add DBM/AwBid payout reporting to DRX on DBM spend
Pros	- Avoids risk of DBM or AwBid self-flooring - Stops subsidizing other exchanges' HB - Reduces QPS explosion on buyers	- Exposes hidden buy-side fees, reduces financial incentive to run a bad auction, helps all buyers - Positive message to agencies & advertisers who want their money to go to working media - Could help expose domain fraud
Cons	- Could lose some access if detection has false positives	- May require contract renegotiation with exchanges - Could lead to demand for more GDN transparency
Next steps if we do it	Sellside: implement OriginId ASAP Buyside: Implement bidding preference to Origin servers only	1. Ali & team follow up to see what is viable 2. Set a commercialization & PR plan, execute in 1H, probably at same time as price change if we do
	Recommended	**Recommended**

Recommendation: do #6 and #7

Asking for DBM to follow thru on the OriginServer buying regardless of ROI. on opt campaigns. Theoretical use case here of a buyer specifically asking for a fixed CPM on a specific exchange for OA buys - follow up to see if this is real

Radical options
(time permitting)

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Discussion: should we be more radical?

EVERYTHING HERE PENDING LEGAL REVIEW -- DISCUSSION OF OPTIONS ONLY, NOT A PLAN TO ACT

Idea	Notes
Make the sell-side free (but we still collect buyer $ and pay it out)	Amazon's exchange bidding (server-side HB wrapper) is 1c fee AdMob, MoPub, Facebook mApp mediation is free Add buyside fees for ADX?
Go back to just tech fees -- allow SSPs, DBM agencies, and AdX buyers to pay publishers directly	Omnicom already getting this from TTD Amazon exchange bidding with 1c tech fee Sonobi exchange bidding with 2c tech fee
Productize client-side header bidding	Build HB into GPT, and GDN+DBM participate in other exchanges' HB + Easier to commercialize - Less control, headers move to server anyway? - worse for users, might not work in AMP
First Price Auction in ADX	+ Solves publisher resentment of big gap between first & second prices - Difficult for publishers to influence yield, lowering prices - Easier for RTB buyers to switch exchanges than improve algorithms

Appendices

Overall threat: lose control over inventory access and ad selection

With server-side wrappers, we lose control over inventory access and ad selection. For example:

1. Facebook demand is already "must have" for publishers, FB wants inventory access and is building HB infrastructure
2. Publishers add FB Header infrastructure to their pages - it just adds yield
3. FB tags spread, allowing FB to develop the functionality/infrastructure to take control of ad selection and develop it into a DFP replacement

> **Possible "end game"**: steady state where there are 2-3 "must-call" server side "wrappers" like Jedi++. We need to remain one of them.
>
> - Amazon wrapper already in the works
> - The more demand we have, the better chance we have to be one of those 2-3.

1) Evolve / accelerate EB: Fully Open EB++ features

	better value than HB
less value than HB	
similar value as HB	
better value than HB	

	Header Bidding	EB++ / Open Jedi feature options	Pubs	Exchange	DSP	User
(1) Deals	- PMPs given same or better priority than AdX - SSPs make all current transactions programmatic with opp cost to help inform the seller of cost of the deal	(1a) parity between AdX & Jedi PA/PD				
		(1b) allow AdX and Jedi buyers to recreate current deal types/goals (note: need 5a before we will allow 1b)*				
(2) Demand Sources	- any SSP or network can build support - buyer gets own cookie and privacy sensitive data on 100% of calls for client side HB	(2a) encourage top networks to join ADX at favorable terms, keeping GDN on equal footing				
		(2b) "trial mode" for SSPs on AdX				
		(2c) cookie match optimization/match all DFP impressions				
(3) Transparency / Fairness	- pub gets all bids & bid times via analytics - buyers can’t opt-out of bid transparency - AdX gets “last look”	(3a) stop letting AdX/GDN/DBM opt-out of bid data sharing				
		(3b) expose bids from Jedi & AdX to pubs in DFP UI & DT				
		(3c) stop giving AdX last look (in Jedi only)				
(4) Configurability	- configurable floors and blocks/rules per SSP, but pub must work with each SSP separately (highly fragmented) - many SSPs allow some level of demand to transact before verification	(4a) configurable floors per SSP (DFP enforces/UI)				
		(4b) configurable blocks/rules per SSP (DFP enforces/UI)				
		(4c) allow limited serving before verification (up to N per creative) and protection for everything				
		(4d) support all formats				
(5) Business Intelligence	- SSPs offer limited analytics and integrations with GA - nobody shows opportunity cost of everything	(5a) show opportunity cost of line items & deals				
		(5b) show opportunity cost of latency				

DRX roadmap will be affected to build all of the above: new big projects or lower priority (eg. s2s, ad blocker thwarting, mediation).

4c: doing malware checks but then allowing limited serving before categorization.

Appendix A: Header infra data for 3 types

Type 1: Remarketing Header infrastructure data

DFL intended to improve on Type 1 Header infrastructure

Observed change in Criteo presence, A9/FB still threats

- Criteo change Q1 to Q3 :
  - HB impressions -16%
  - Networks using Criteo HB tags +19%
  - % of DFL revenue from 6.2% to 18.5%

- ~40% of Criteo HB imps are in guaranteed space globally, but declining
  - 70% in EMEA

% of Criteo Impressions Booked as Guaranteed Line Items
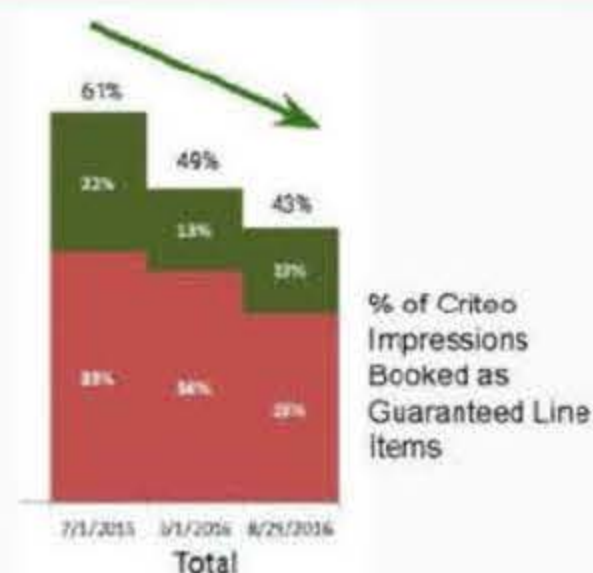
Total

	7/1/2015	3/1/2016	8/29/2016	13 month change
Criteo HB as % of Total DFP Impressions	0.92%	0.83%	0.7%	-23%
AdX as % of Total DFP Impressions	22%	22%	21%	-5%
DFL as % of Total DFP Impressions	0.29%	0.26%	0.2%	-31%

Source: DFP data, Global LPS partners

AdX impact

steal: HB/Jedi wins impression AdX would have won

price pressure: HB/Jedi 2nd prices AdX

steal : price pressure ratio

- HB: 1.5:1
- non-HB remnant: 1.82:1
- Jedi: 1.16:1

→ Jedi looks better for AdX than HB or average price remnant LIs

Pub revenue lift

- HB: 8-20% (50% from media reports)
- Jedi: 3-8%

→ HB performs better than Jedi from pub perspective in Alpha, but on *very limited experimental data with a very small number of exchanges participating in Jedi vs HB*

Type 2: Auction pressure Header infrastructure / Jedi data [back to types of Header infra]

Type 2 HB growth from Q1 to Q3 2016
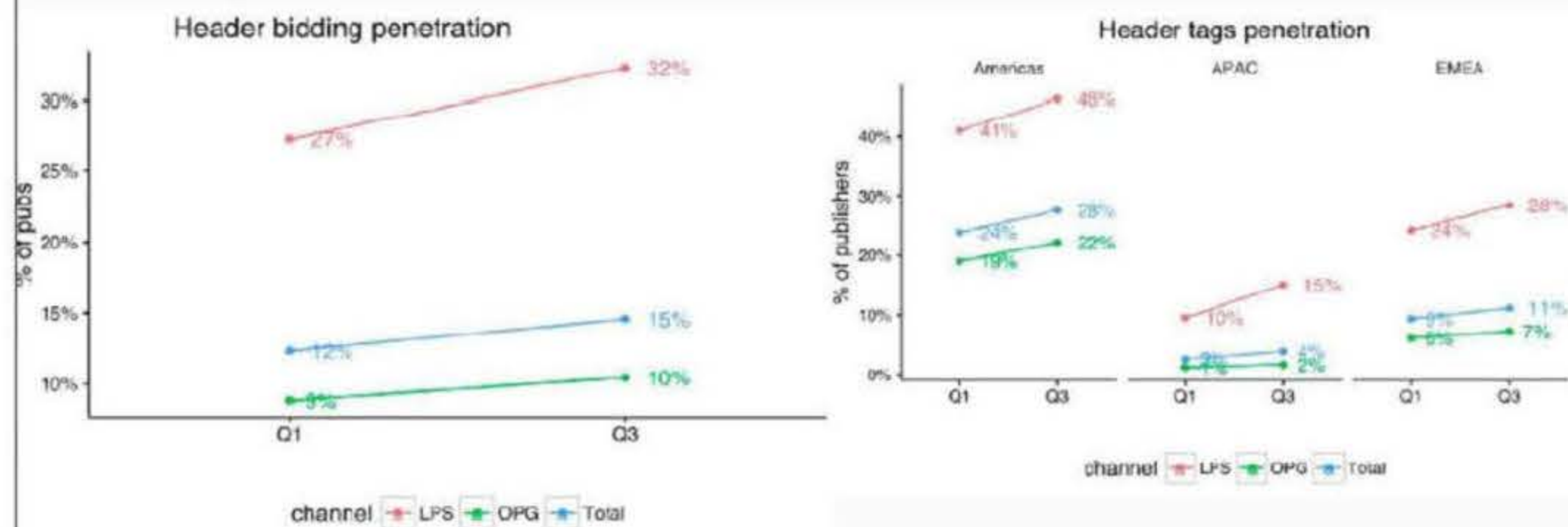
used for the detection:
Bucketing: similar enough line items with different rates
KeyValues: looking at known HB keyvalues + when the rate is appearing in the values of KeyValues

The difference with LPS AMS was coming from different things. The main one was that I was looking at DFP accounts whereas the publisher team was looking at publisher parents.

The gap is now much much narrower, ~46% penetration for LPS AMS.

Type 2: Auction pressure Header infrastructure / Jedi - expected impact

	Pub revenue		AdX revenue		Google profit (Jedi, AdX or zero for HB)	
	Jedi	HB	Jedi	HB	Jedi	HB
Match (new queries won by Jedi or HB)	increases	increases	no change	no change	increases	no change
Steal (Transaction happens in Jedi or HB rather than AdX)	increases	increases	decreases	decreases	up if Jedi revenue (AdX margin /Jedi margin) times what the AdX revenue would have been	decreases
Price Pressure (transaction happens in AdX at higher price)	increases	increases	increases	increases	increases	increases
Buyer shift cannibalization: budget moves from AdX to another exchange	Increase (if relative margin is lower) , decrease (if rel. margin is higher) or no change (if rev shares equal)	Increase (if no SSP fee) or no change (if rev shares equal)	decreases	decreases	decreases (same spend going through lower margin channel)	decreases

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Currently have X integrated, more on the way
Buyers not scaling

Appendix B1: Jedi++ Product detail (P0)
[BACK](#)

(1) Deals

(1a) - Parity between AdX PA/PD and Jedi PA/PD
- SSPs can self-declare when bid is for a deal, and whether it's OA vs PA vs PD
- In auction we will give Jedi PA/PD the same boost as AdX PA/PD

* **(1b) - Allow AdX & Jedi buyers to re-create current deal types / goals with opportunity cost displayed (1b blocked by 5a)**
- Commonplace today to run deals via HB
- Pub can configure (through hacking) any deal type in DFP. HB PG deals require 3p verification of I/O with multiple deal/goal types.
- Requires that Google verify IO to get media cost for calculating rev share

* = new functionality also applies to AdX buyers

(2) Demand sources

(2a) - "Trial mode" for SSPs on AdX, but only when approved by individual pubs
- Pub can let SSP buy via Jedi only if a contract exists
- Pub can let SSP buy via AdX on a trial basis if a contract doesn't exist
- SSPs on AdX would be subject to standard AdX rev share and policies

* **(2b) - Aggressive optimization on pixel push to improve rates**
- Experiment launched in 2015, but needs follow-up work on optimization

* = new functionality also applies to AdX buyers

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(3) Transparency / fairness

(3a) - Remove option for buyers to opt-out of bid data sharing (AdX, DBM, GDN)
- DBM has agreed, still waiting on approval from GDN
- Crucial for pubs to have transparency to compare vs Jedi on 100% of bids

(3b) - Expose bids from Jedi and AdX to pubs via DFP UI and DT
- Bid data commonly available today for pubs using HB
- DFP UI would show aggregated data ("bid landscapes") and DFP QT would provide query level data (top N bids)
- Allows pubs to verify our auction mechanics are as claimed
- Demonstrates our commitment to data transparency, openness, honesty

(3c) - Stop giving AdX "last look"
- Considered unfair by SSP and pubs, would improve perception of fairness

(4) Configurability

(4a) - Allow pub to set floors per SSP (DFP will enforce)
- Commonly available today for pubs using HB
- Let pub do this within DFP w/o needing to log into each SSP separately

(4b) - Allow pub to configure blocks/rules per SSP (DFP will enforce)
- Requires that we scan every creative (categorization)
- Major advantage vs HB if pub has place to handle controls across all SSPs

* (4c) - Allow limited serving before verification (up to N times per creative)
- Allow pub to toggle between "scan every new creative before serving" vs "allow new creatives to serve up to N times before scanning"
- Pub could control which buyers are eligible and set N per buyer
- Option could apply to anyone - normal AdX buyers, SSPs on AdX, DBM, GDN

* = new functionality also applies to AdX buyers

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(4) Configurability... continued

(4d) - Support all formats (native, video, AMP, OTT, etc)
- Commonly available today for pubs using HB (except AMP and OTT)

(5) Business intelligence

(5a) - Show opportunity cost of line items and deals

- Use forecasting to estimate the value that line item / deal impressions would fetch in the open market and compare vs actual transacted value
- Requires that pub provide Google with actual revenue on non-OA impressions

(5b) - Show opportunity cost of latency

- Use experiments framework to create different levels of latency, then evaluate repeat visits and visit duration for control vs experiment users
- Use experiment results to forecast the monetary amount lost due to users turned off by extra latency, allow pub to contrast this vs incremental demand

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Appendix B2: Jedi++ Product detail (P1+)

Non-P0 features to reach functional **parity** vs HB today

[P1] Pub controls - allow configurable timeout at network level
- Commonly available today for pubs using HB
- Timeout would be configurable per DFP account, not per SSP

[P1] RTB signals - parity between AdX and Jedi (*except* for winning price co-op)
- Jedi would get viewability, hyperlocal, mediation, CTR, VTR, etc ([list](#))

[P2] Allow top networks (CRTO, AMZN, FB, GDN) to participate via Jedi
- Risk cannibalization of AdX anyway - but rather via Jedi than HB
- Only provide this to those who can prove management in pubs interest

[P3] Billing - allow direct billing arrangements for media (but not rev share)
- As with deals, would require that Google verify IO to calculate rev share
- Google still source of truth on impressions used to calculate rev share

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Non-P0 features to be functionally **better** vs HB today

* **[P1] mApp - allow SDK demand to flow seamlessly via RTB auction**
  * SDK used for signal collection and creative rendering, RTB just for auction
  * Better functionality vs current mApp HB in market today

* **[P1] Bad ads - self-service UI for Enigma, pub can track where creative came from**
  * We encode _all_ ads with non-perceptible QR code unique to that impression
  * When pub finds bad ad - take screenshot, upload to UI, find its source quickly
  * Works on all DFP ads (not just Jedi) but protects pub against potential risk of seeing lots of bad ads flowing in through new / unknown Jedi exchanges

  [P1] Troubleshooting UI - visualization of performance, DFP breakdown, etc.
  * Existing reporting (QT, DT) highly complex and difficult for pubs to interpret

* = new functionality also applies to AdX buyers

* Design new, intuitive UI to show what's happening - a la RTB Breakout

Non-P0 features to be functionally **better** vs HB today... continued

[P2] Reporting data sliced by advertisers/buyers
- Jedi offers integrated reporting, pubs want to see it broken down by advertiser/buyer

[P2] Bad ads - full support for ARC
- Requires that we scan every creative
- Improve workflow for troubleshooting bad ads, reduces risk of bad Jedi ads

[P3] Auditable data - provide top N Jedi bids and top AdX bid in new Jedi DT
- Allows exchanges to verify our auction mechanics are as claimed
- Demonstrates our commitment to data transparency, openness, honesty

[?] Buyer API - expose GDN's API to AdX buyers, charge GDN-level rev share
- Onboard new demand from less technical buyers (e.g. Nanigans)

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Appendix C: Current Jedi product and roadmap

Public announce in April; ramp throughout '16; GA & all-platform support in 1H '17

build core RTB offering ≫ mApp, native ≫ scalability, fixes ≫ GA ≫ deals, video

Milestones

POC launch
5-10 pubs
(web only)

alpha launch
5-10 pubs
(web only)

beta launch
30-40 pubs
(web, mApp, native)

GA launch
(web, mApp, native)

deals,
video

Comms

announce "pilot" @
programmatic i/o
& blog post

major topic @
DLS '16 w/ sessions

marketing push pre-holidays
(mApp, native, adoption #s)

announce support for all
platforms @ DLS '17

Goals

POC exchanges' RTB
win rates on par w/ HB

eCPMs on par w/ HB for
POC/alpha pubs

POC/alpha/beta pubs move >x% HB callouts to DS &
POC/alpha/beta exchanges onboard >y% of new pubs
via DS

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[product design] - Feature evolution by launch milestone

Q1 '16	Q2 '16	Q3 '16	Q1 '17	2017
Proof-of-Concept	**Alpha**	**Beta**	**GA**	**Post-GA**
5-10 pubs 2-3 exchanges	5-10 pubs 4-5 exchanges	30-40 pubs >5 exchanges	[TBD #] pubs [TBD #] exchanges	[TBD #] pubs [TBD #] exchanges
Web inventory only	Web inventory only	Full support for mApp & native	Continued focus on sales / gtech scalability	Allow exchanges to strike deals via Marketplace
RTB callouts w/o value-add signals	New UI for pubs and for exchanges	Focus on sales / gtech scalability	Resolve any critical tech or business issues surfaced	Greater focus on optimizations to enhance yield, opt-in offerings
No UI for pubs or for exchanges	Reporting on imps, CPM, revenue, RTB breakout metrics	Reevaluate: 100ms timeout, 5% rev share, rules on who participates	Run training for pubs & exchanges	Solutions to help DSPs manage QPS overload (e.g. ECO)
Config targeting manually & bypass rules, pretargeting	DFP push cookie match w/ reporting	Billing UI splits out each exchange	Refinements to cookie match	Support for video
Billing via AdX on buyside & sellside	Limited verification post-serving			

[background] - How header bidding works

Setup Beforehand	@ Page Load	@ Call to DFP

1 For each header bidder, pub places code snippet to <head> of all pages

```
<script
src="//hb.com/bid.js">
.....
</script>
```
Page

3 Each snippet calls its respective bidder (SSP/DSP/network)

Page → Header Bidder Server

5 Page calls DFP for ad, passes all header bids as key-value pairs

Page → DFP

"rate" = $3

2 Pub creates line items in DFP using key value pairs for decisioning

| Targeting → custom criteria = ... |
| Targeting → custom criteria = ... |
| Targeting → custom criteria = ... |

4 Bidder responds with signal representing bid value

Page ← Header Bidder Server

$3

- exact bid
- CPM range
- high / med / low

6 DFP selects appropriate line item based on key-value pairs

Page ← DFP

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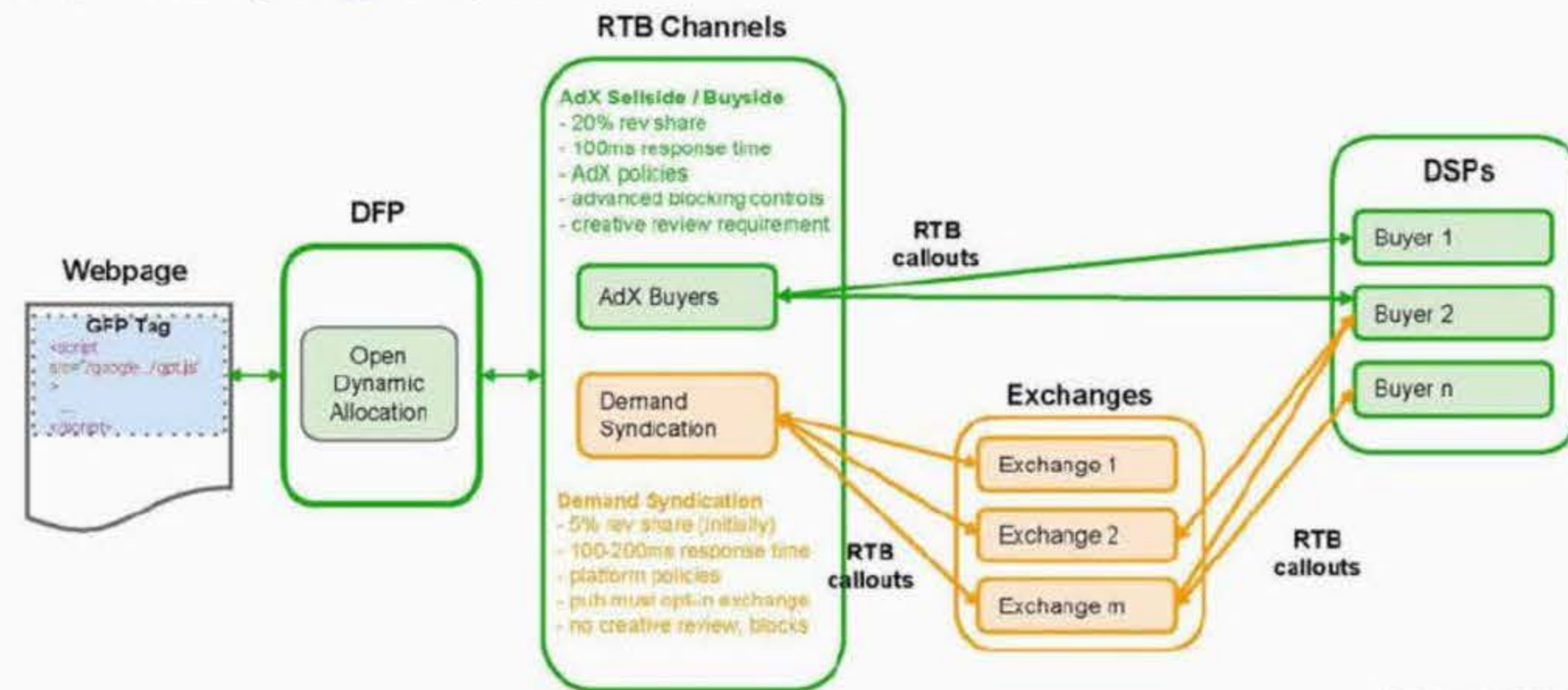Attorney-Client Privilege

[background] - Header bidding end-to-end request flow
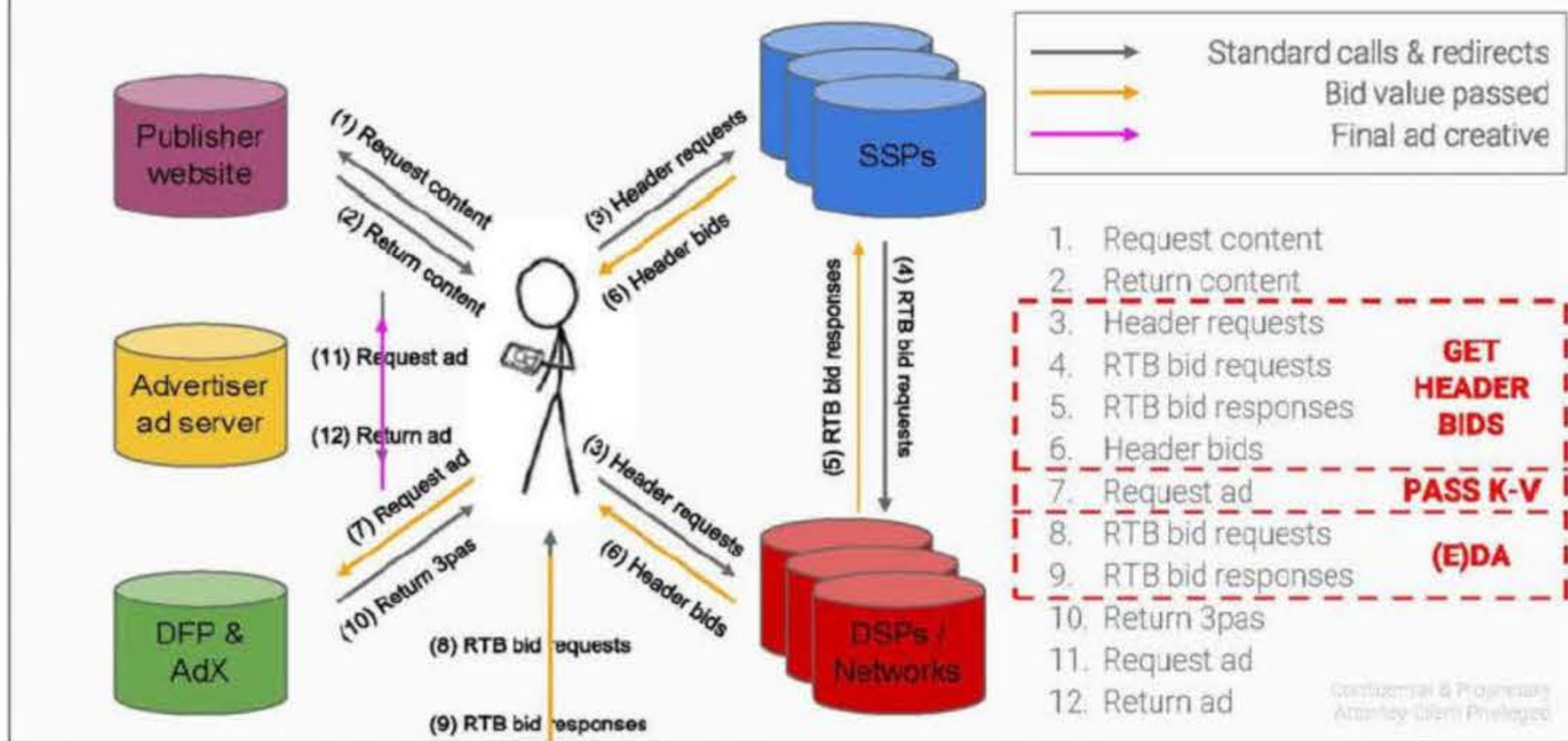
[product design] - RTB access for non-AdX exchanges

Green = exists today, Orange = new product

[product design] - Auction mostly replicates how header bidding works today

What happens today (header bidding)

DFP

Reservation →
Exchange →
Exchange →

1st-price auction

3rd party reserve
(includes HB bids)

AdX

AdX Buyer — RTB →
AdX Buyer — RTB →

2nd-price auction w/
3rd-party reserve

(HB *can* outbid AdX deals)

Unified auction (demand syndication)

DFP

Reservation →
Exchange — RTB →
Exchange — RTB →

1st-price auction

3rd party reserve
(includes DS bids)

AdX

AdX Buyer — RTB →
AdX Buyer — RTB →

2nd-price auction w/
3rd-party reserve

(DS *cannot* outbid AdX deals)

→ EDA "temporary CPM"
→ Header bid to client
→ RTB bidresponse

DS to reach full parity with HB once exchanges
can strike deals with pubs via Marketplace

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[product design] - Better than header bidding for pubs, but could lead to buyer flight

	Waterfall	Header Bidding	Demand Syndication	AdX Buyside
Yield	average pricing	per-imp price signal	RTB	RTB
Latency	multiple passbacks	wait for <head> bids	least latency	least latency
Buyer setup	complex waterfall	page header setup	easy opt-in	automatically eligible
Billing / reporting	varies, not unified	varies, not unified	best in class	best in class
Pub controls	varies, not unified	varies, not unified	varies, not unified	best in class
Rev share	0% + exchange fees	0% + exchange fees	5% + exchange fees	20%
Policy enforced	platform policies	platform policies	platform policies	AdX policies

Objective: make demand syndication *just a little* better than header bidding

Variations on the 1st price slide

2) DRX changes: Should we move to a first price auction?

- **Lots of theories about what will happen, most bad for publishers and pricing**
  - Keeps publishers from chasing the price gap, theoretically should converge to the same price, but...
  - Concern that publishers think short-term and won't have the resolve to take the hit when they try to maintain prices
- **Proposal: take another step towards first pricing**
  - Make ADX a participant in the Jedi auction instead of combined auction
  - Jedi auction remains first price
  - ADX auction remains 2nd price, but we ask buyers to optionally submit a first price bid for use in Jedi auction if they win

  Will replace this with another slide tbd -- other options in the appendix

  - This gets the buyside ecosystem ready for first price, gives us the data to make an informed decision about how it will really work in practice, and sets us up for things like per publisher/per inventory first/second choice.
- **Timeline**

Remove incentive for gaming multiple 2nd price auctions to simulate 1st price
Remove risk of buyers cutting AdX spend to limit self-pricing danger

Should we move to a first price auction?

Pros

GDN - simpler: no need to discover /optimize against "dirtiness" of auctions

GDN - ROI could increase from lower prices

ecosystem - no more publisher "gap envy", auction rules easily understood on AdX

Cons

Pubs - much harder to price, bids are much weaker signal of value. Could increase reliance on "black box" AdX systems like RPO

AdX - pubs move to other SSPs to retain stronger pricing control

Unknowns

ecosystem: other exchanges move to first price?

Header infra - other SSPs lose ability to differentiate on better yield if they also move to 1st price

AdX: unsophisticated bidders move to other exchanges to avoid bad ROI on 1st price AdX. These buyers smaller on ADX, larger overall across all SSPs.

Proposal: take another step towards first pricing
- Make ADX a participant in the Jedi auction instead of combined auction
- Jedi auction remains first price
- ADX auction remains 2nd price, but we ask buyers to optionally submit a first price bid for use in Jedi auction if they win
- This gets the buyside ecosystem ready for first price, gives us the data to make an informed decision about how it will really work in practice, and sets us up for things like per publisher/per inventory first/second choice.

Remove incentive for gaming multiple 2nd price auctions to simulate 1st price
Remove risk of buyers cutting AdX spend to limit self-pricing danger

1) fists price does not create new value
- first price not necessairly easier than 2nd price: need to be good at doing RPO to maintain value
2) easier for buyers to move spend if others don't follow
3) move is irreversible or extremely expensive
- get much better at RPO
4) trend towards pubs being smarter about pricing

Should we move to a first price auction?

	ADX 2nd price, bidders submit first price bid for Jedi auction		Publishers choose ADX model as first or second price		Everything first price	
	Sellside view	Buyside view?	Sellside view	Buyside view?	Sellside view	Buyside view>?
Publisher can influence yield and explore price	Higher	Higher	Choice	Choice	Lower	Lower
Gap envy	Higher	Higher	Choice	Choice	Lower	Lower
Prices	Higher	Lower ROI	Choice	Choice	Lower	Higher ROI
ADX auction clearer	Consistent	Harder	Choice	Choice	Similar	Easier
Influence ecosystem to remove dirtiness	Keep DRX clean	No	Maybe	Maybe	No, pubs want to control yield	Yes
Safe access to inv	More	More	More	More	Less	Less
Dirtiness detection effort	Depends on other SSPs	Depends on other SSPs	Depends on other SSPs	Depends on other SSPs	Depends on other SSPs	Depends on other SSPs

Remove incentive for gaming multiple 2nd price auctions to simulate 1st price
Remove risk of buyers cutting AdX spend to limit self-pricing danger

Slides that may go to the graveyard

2) DRX changes: Options for margin / pricing

"okay" = rough parity w/ market pricing

	Lower AdX Rev Share	Lower DFL Rev Share	Raise Jedi Rev Share	Shift Rev Share from Sellside to Buyside
Description	- reduce AdX sellside rev share to 10-15% (currently 20%)	- only for DFL impressions reduce rev share to 5-10% (currently 20%)	- increase Jedi rev share to 8-10% (currently 5%)	- reduce AdX sellside rev share to 0-10% - add additional 5-10% rev share to buyside
Pros	- closer to market prices - reduces gap between AdX vs HB/Jedi, so expect less cannibalization via OA case	- closer to market prices - good vs RMKT case - less margin loss if only done for DFL impressions	- DRX gains margin - reduces gap between AdX vs HB/Jedi, so expect less cannibalization via OA case	- having rev share on buyside allows us to discount for mega buyers (FB, CRTO, etc) - pubs feel they're paying less
Cons	- DRX loses margin (-8% profit -1.5% rev @15%) - AdX still less competitive vs tags for RMKT use case	- DRX loses margin - AdX still less competitive vs other SSPs for OA use case	- high price vs market today - AdX still less competitive on both RMKT & OA use cases	- DVAA loses margin unless buyside covers full amount - DBM & AdX buyers might not tolerate increase
Compared to Header Infra: **vs RMKT case**	insufficient	okay	insufficient	better
vs OA case	better	insufficient	okay	better
vs Deals case	okay	insufficient	insufficient	okay

We should incorporate the experiment based data from here as well:
https://docs.google.com/presentation/d/1OlVHevLeXSiUk2frxl-hEJbN980qMqyOuxL2shRV4dM/edit#slide=id.p
Full numbers here: https://docs.google.com/document/d/1J8umTCY9s9B3XVGGpyM4zTW7-bZs4ibUQaqx_ju8t-o/edit

1) Evolve / accelerate EB - options

	Current Plan (1H/2H 2017)	Current Plan Accelerated (1H 2017)	Limited Jedi++ (2017-18)	Fully Open Jedi++ (HB server-side) (2017-18)	Build client-side HB solution (2017-18)
Description	- all formats - remnant deals - Jedi PA/PD parity - troubleshooting & reporting UI - cookie match opt	- divert resources from other efforts to accelerate current plan - finish by end of DrSeuss instead of end of DrZoidberg	- all of Current Plan - add paced deals & show opportunity cost - floors & rules per SSP - bid data sharing and all bids exposed in UI & DT	- all of Limited Jedi++ - AdX loses last look - SSP "trial mode" - limited serving before verification - FB, AMZN, CRTO allowed on Jedi	- stop work on Jedi - build DFP version of AppNexus' prebid.js
Pros	- somewhat competitive vs HB - no extra resource	- 6 months faster	- slightly better than HB - increase DFP competitiveness (business intelligence)	- seen as fair by pubs and exchanges	- easier to commercialize - access to data
Cons	- insufficient to stop industry investment in HB (eg attracting enough exchanges)	- still insufficient to alter industry momentum (eg attracting enough exchanges)	- major investment - GDN shares bids - not seen as totally fair / open	- major investment - AdX loses last look advantage & AMZN/CRTO rev	- **evolves to Jedi++ anyway as server-side wrapper** - DFP loses control - bad for users - might not work on AMP pages
vs RMKT case	okay	okay	good	great	okay
vs OA case	okay	okay	good	great	okay

Comparisons were based on the features in each bucket, so if we change the features then the comparisons change too.
Why is column 4 only "good" for the deals case? --> #4 adds new capability primarily for the RMKT/OA cases but not much incremental functionality for the deals case.
Where are the shortfalls vs HB? [on #4] --> I was actually defining parity with HB as "okay". With the addition of opportunity cost I figured that deals would be incrementally better on #3/#4 vs HB, hence "good".
Also why is rmkt just ok for current/accelerated? --> This was based on the assumption that parity with HB is "okay", and our current plan feels pretty comparable to HB functionality on RMKT/OA use cases.
Why is fully open/fair a "major investment? --> #4 includes all the stuff from #3, plus additional stuff (SSP trial mode, limited serving before verification). Seemed like a lot of work.
Why are FB, AMZN, CRTO allowed on Jedi vs better pricing on ADX? Where is DFL margin reduction discussion? --> We could add margin discussion here. I wasn't sure whether to include those in the current options or save for a separate discussion since there's been a lot of pricing discussion offline that a bunch of us haven't been included in.
Dropping Jedi and adding HB to DFP, doesn't this become server-side header bidding which immediately becomes Jedi++? --> Jedi++ also has unified floors/blocks, unified billing, business intel.
The more aggressive we want to be, the more we need to consider dropping our lowest priority big projects or other big projects we haven't started yet. For example, we might not do server to server at all until this is done since that is a totally new project. The projects that most overlap with the resources who would work on jedi++ are s2s, ad blocker thwarting, mediation, but it need not be those things that we would put on hold because we could potentially shift resources around.

Jedi++ is DRX++ - New vision of Google's core ad stack for media marketplaces

Jedi/DRX++ Goals
- Build something better than HB to avoid further industry investment in HB/HB wrapper infrastructure
- Design transaction architecture so superior that it's always "must call"
- Make Google part of every transaction to benefit from data network effects

Jedi++/DRX++ First Principles
- Build the product the market wants, regardless of Google's current interest and view of buy/sell fairness
- Informed choice at every level of the product to guide good publisher decisions without imposing Google's judgement
- Remove all reasonable buyer & seller objections to participation
- Monetize our key differentiators (all display/video transaction data, computation at scale, optimization, malware) not commodities (Callouts, reconciliation) Confidential & Proprietary Attorney-Client Privileged

Key Factors Gating EBDA Adoption

Publishers

- Deals
  - Exchange deals (PD/PA/OPA)
  - Reservation Deals (PNG, PG, LIT)
- Demand sources
  - Access more demand sources
  - Self service onboarding
- BI
  - Insufficient data on yield/revenue gains from EB vs HB
- Configurability
  - Pubs used to fiddling with HB knobs (latency, lineitems) need to be trained
- Pricing

Exchanges

- Deals
  - Top mApp players (FB, MoPub) are not participating
- Eligibility
  - Top-tier exchanges like Rubicon (~$1500/day) and OpenX (~$250/day) are slow to increase spend
- Scale
  - OpenRTB protobuf integrations needed as OpenRTB JSON allows max 5K QPS
  - User sync (match rates)
  - Lack of signals such as floor prices, DFP ad units, viewability, hyperlocal, hCTR, etc
- Configurability
- Pricing

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