

Protected Audience AB testing

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CRITEO

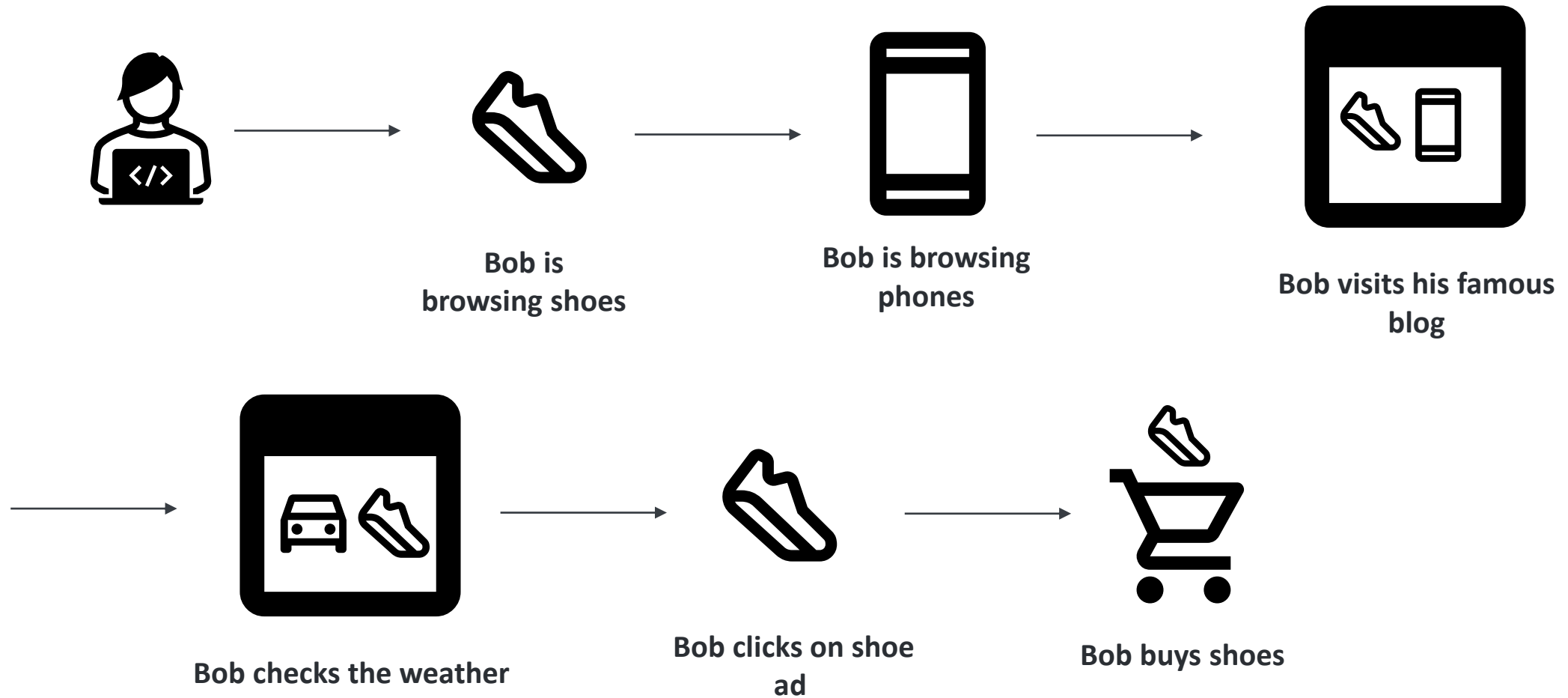
Why do we need AB testing ?

- A/B testing is a key feature for experimentation in order to increase performance of Protected audience
- It allows us to measure the impact of technical changes
- We must be able to measure long term effects in a consistent way

No AB testing capabilities

=> No possibility to tune performance of PA
advertising campaigns

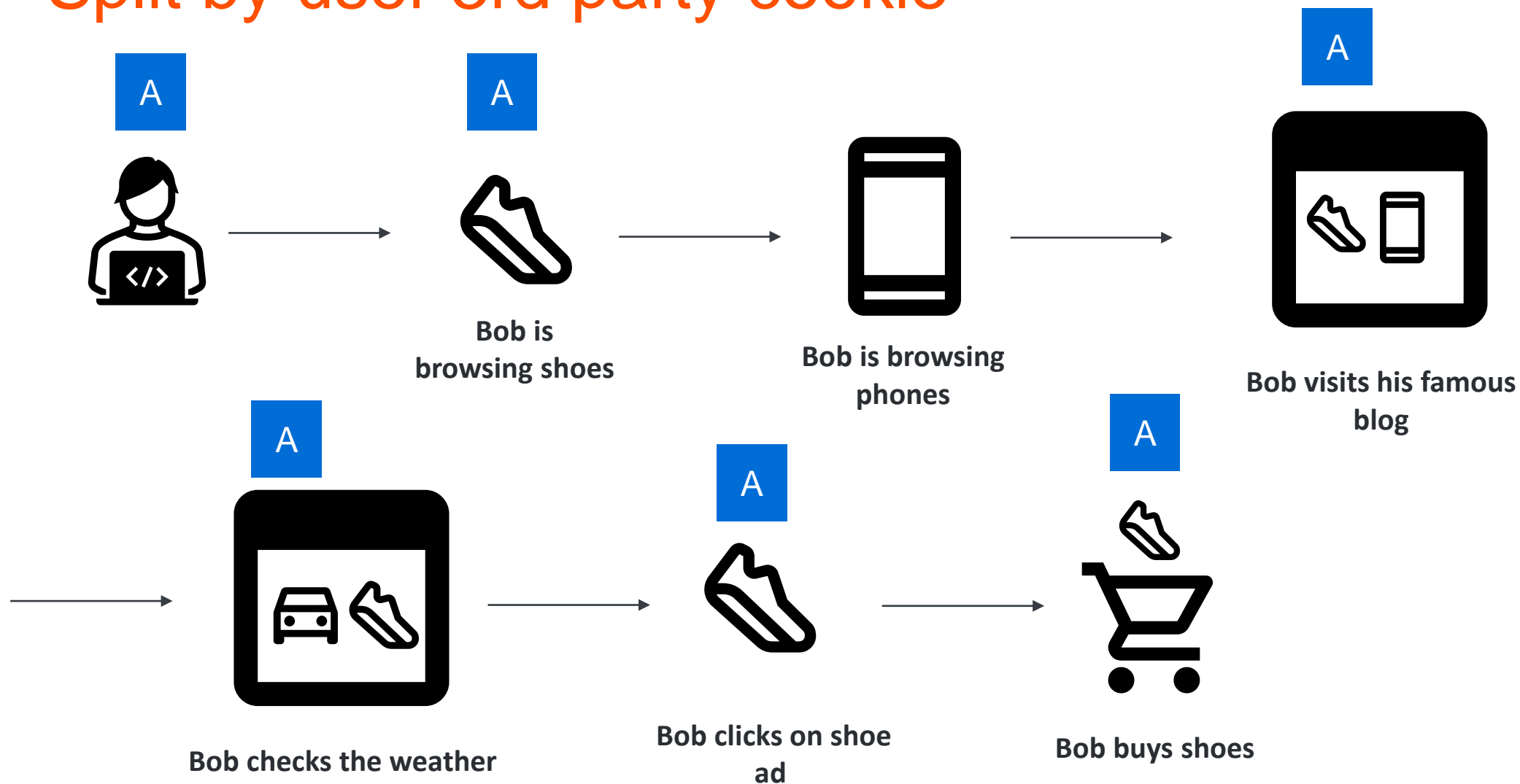
Some user scenario



How to split AB tests ?

- 2 populations A & B
- Split by user => 3rd party cookies mode, user is consistently exposed to the A or B behavior
- Split by 1st party user id, publisher website or advertiser website

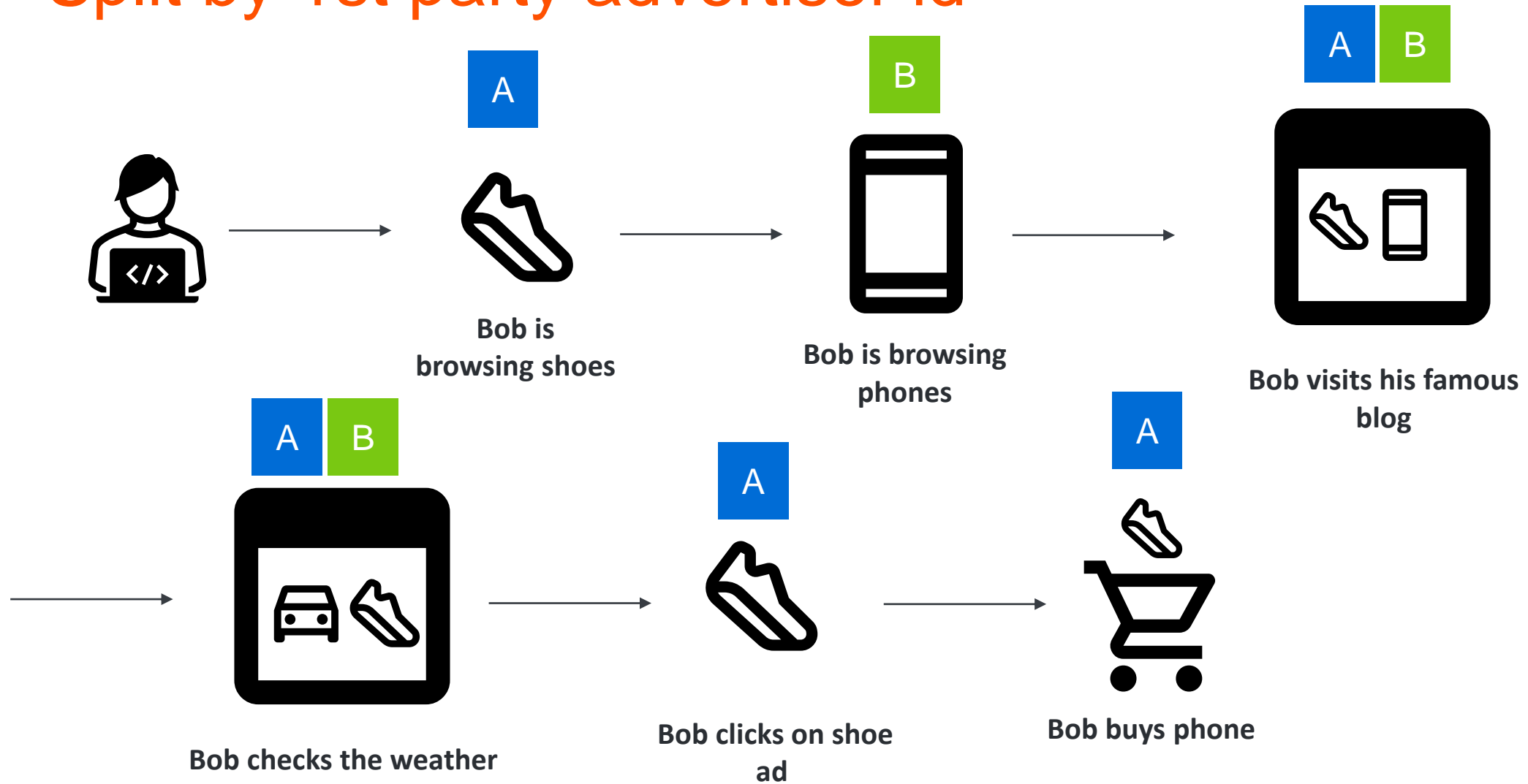
Split by user 3rd party cookie



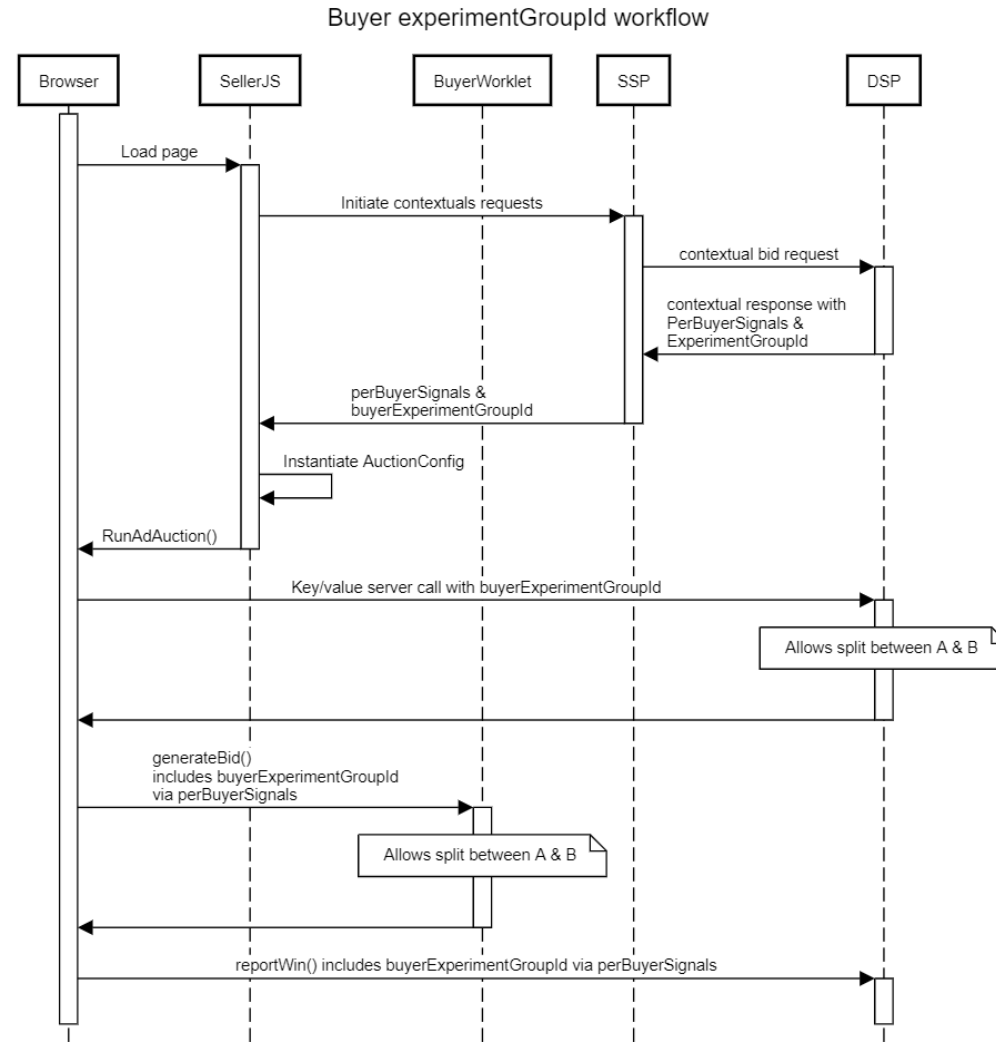
Split by 1st party publisher id



Split by 1st party advertiser id



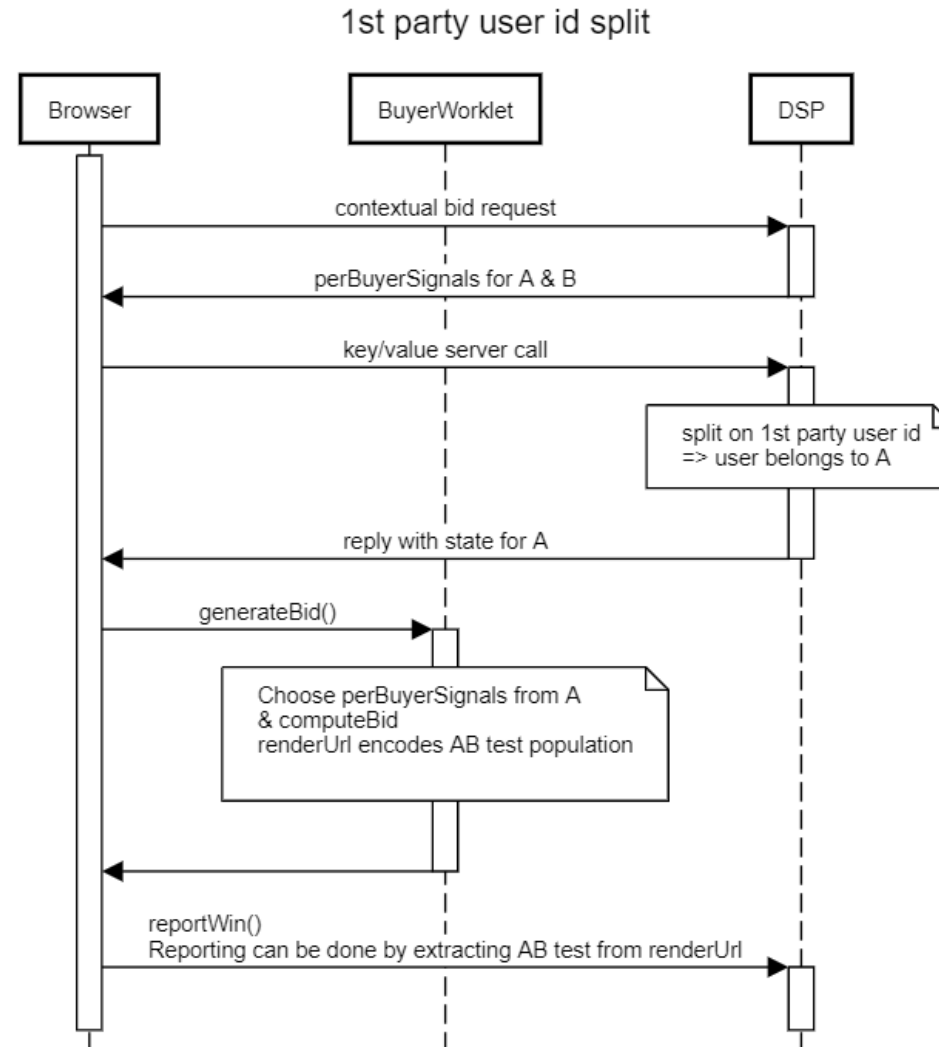
Existing mechanism with ExperimentGroupId



Existing mechanism with ExperimentGroupId

- We cannot measure long term effects, split on contextual signals only
- It might not be applicable to auctions where signals are resolved in an asynchronous way as in this case the contextual call and the key/value server call run in parallel
- Can be used for technical AB tests

Splitting per interest group and 1st party user id



Splitting per interest group and 1st party user id

- We cannot handle a large number of AB tests in parallel, in any case less than with ExperimentGroupId
- Leakage as the same user will change for different advertiser websites which will be an issue when the behavior is changed on retargeting campaigns for multiple advertisers or when more upper funnel campaigns are used
- Additional bias because we split user based on tagging behavior and not when we get a bid opportunity
- Can be used for advertiser only AB tests

Proposal - Inject a low entropy global user population into computeBid

- Inject a low entropy global user population into computeBid, 3 bits
- Constantly rotate the population, 1% every day, mitigation against population drift and adtech's colluding attacks
- Add to the attestation to prevent ad techs sharing this id aka cookie sync scenario
- Allows few AB tests, other AB tests done via ExperimentGroupId or UserIdSplit

Reporting – short term event level

The identifiers could only get out of the of generateBid via

- by adding more renderUrls at the expense of k-anonymity
- by reserving some bits of modelingSignals at the expense of handling less advertiserSignals

Reporting – long term aggregated

- Final metric will be aggregated

Population	Clicks	Sales
A	2000	100
B	2580	150

- Seems fully compatible with aggregated reporting and DP noise

<https://github.com/WICG/turtledove/issues/909>