Post 3PCD Debugging Proposals Feedback

Aggregate Debug Reporting

- Allows measuring counts of various debug events + auxiliary information
- Similar flow to current Summary Reports
- Plan to support all the same verbose debug reports currently supported plus some additional ones
- Requires using Aggregation Service
- Separate contribution budget (65,536) and Aggregation Service epsilon of 1
- Potential increase in null reports

Sample Source & Trigger Registration

```
{
  ...
  "aggregate_debug_reporting": {
    "key_piece": "0xFFF000",
    "value": 128,
    // Use integers for the reserved 12 bits.
    "include_debug_codes": [1], // optional
    "exclude_debug_codes": [2],  // optional
    // Source registration only
    "aggregation_coordinator_origin": "https://aws.example"
   },
}
```

Sample Payload Structure

key: source key_piece | trigger key_piece | debug code key_piece
value: value

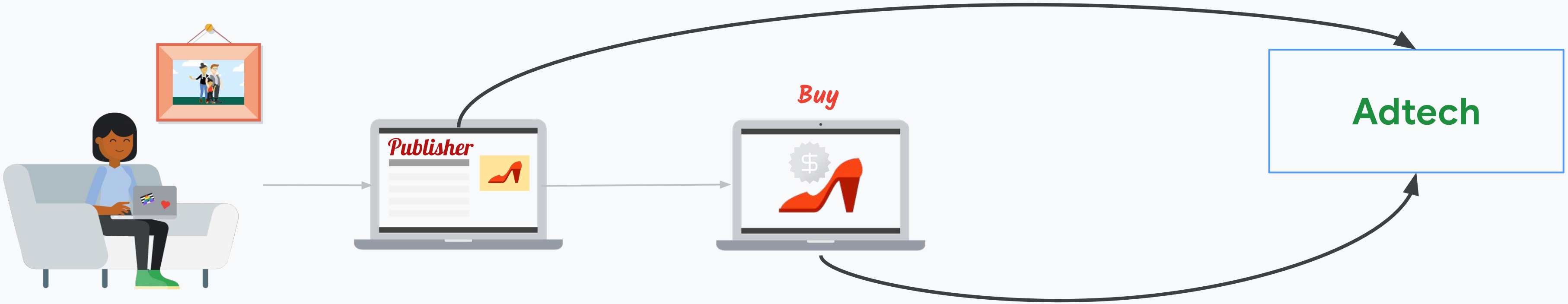
Aggregate Debug Reporting Cont.

User's Browser

User clicks a Shoe Ad on publisher.com that leads to advertiser.com

User buys shoes on advertiser.com

encrypted debug report



Adtech

encrypted debug report

Adtech

Source Registration1
aggregate_debug_reporting
- source_key_piece
- value
- include/exclude

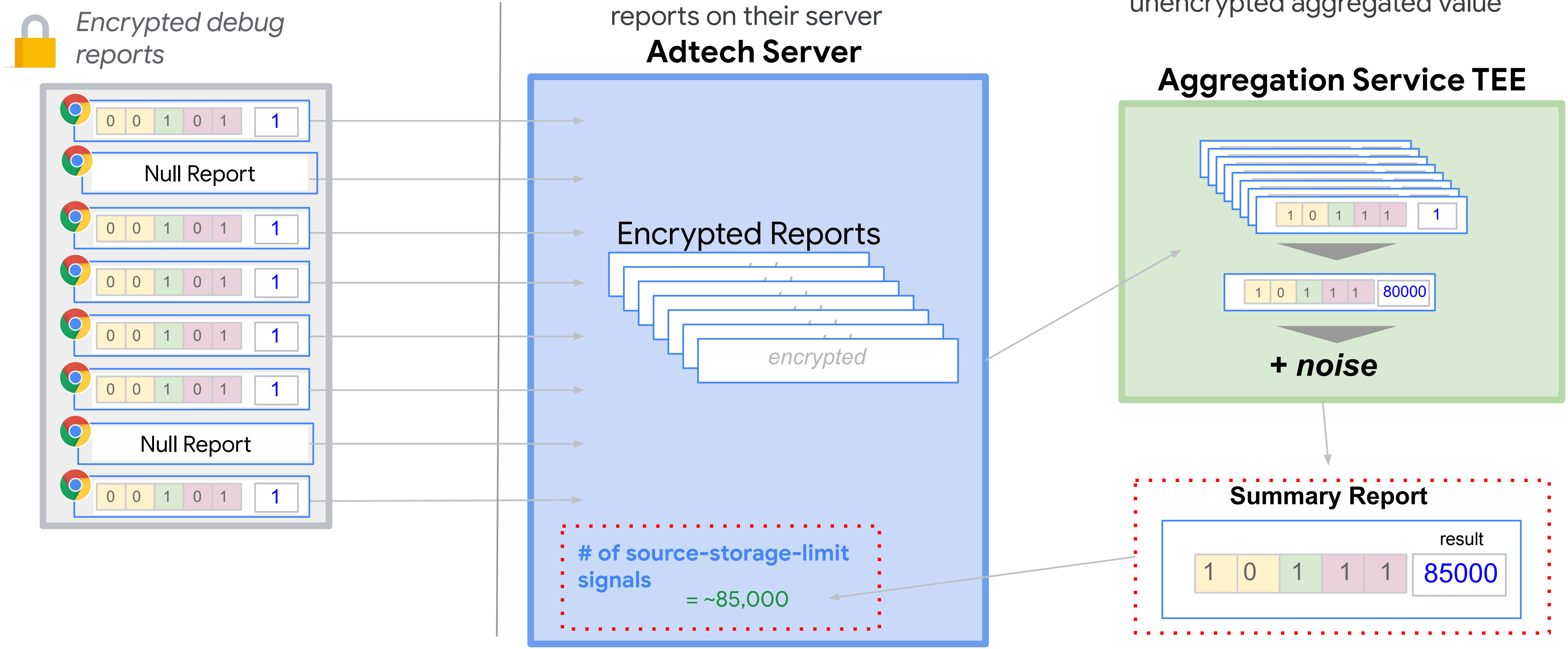
Trigger Registration1
aggregate_debug_reporting
- trigger_key_piece
- value
- include/exclude

*Assuming there is a real debug signal for each registration. If there is no real debug report then a null report will be sent

Aggregate Debug Reporting Cont.

Adtech company stores and batches encrypted reports on their server

Batches are sent to TEE to decrypt and aggregate. Receive back unencrypted aggregated value



# of source-storage-limit signals

= ~85,000

Local DP Debug Reporting

- Allows measuring counts of various debug events
- Debug reports can be sent per registration
- Plan to support all the same verbose debug reports currently supported plus some additional ones
- One sided debug keys
- Does not require Aggregation Service
- Data can be aggregated based on ad-tech's schedule
- Aggregated data can be de-noised

Sample Source & Trigger Registration

```
{
  ...
  "local_aggregate_debug_reporting": {
    "debug_key": "123456789", //64 bit unsigned integer set by ad-tech
    "epsilon": 1 //default; TBD if this will be configurable
   }
}
```

Sample Debug Report

```
{
  "type":"source", // or "trigger"
  "debug_key":"123456789",
  "epsilon": 1,
  "data":"0x4" // hex representation of the binary (000000100). Each bit
                   of data represents a debug code with noise
}
```

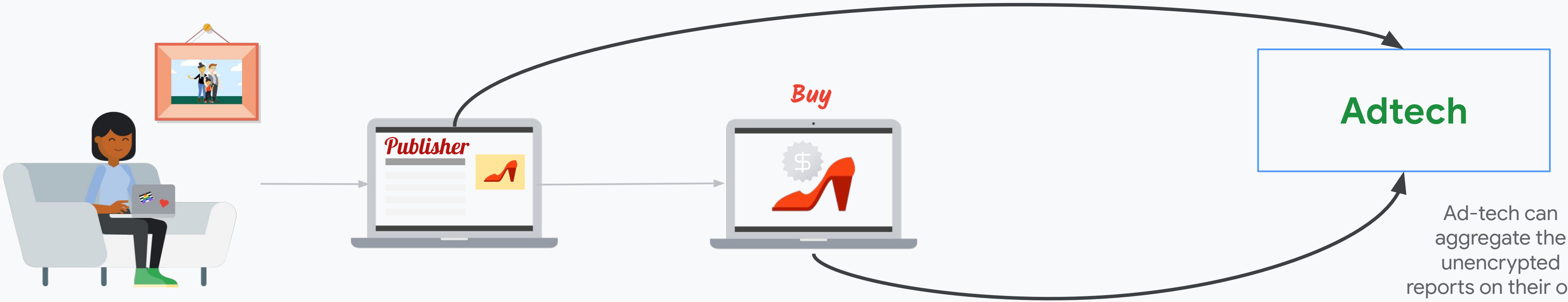
Local DP Debug Reporting Cont.

User's Browser

User clicks a Shoe Ad on publisher.com that leads to advertiser.com

User buys shoes on advertiser.com

unencrypted source debug report



Ad-tech can aggregate the unencrypted reports on their own schedule

unencrypted trigger debug report

Adtech

Source Registration1
local_aggregate_debug_reporting
- debug_key
- epsilon

Trigger Registration1
local_aggregate_debug_reporting
- debug_key
- epsilon