



Digital Advertising Industry Requirements

For Proprietary Ad Systems Built by Platforms and OS Providers

Version 1.0

Please email support@iabtechlab.com for questions and feedback.

This document is available online at <https://iabtechlab.com/privacysandbox>

About this document

In this document we set forth a set of baseline system requirements for Proprietary Digital Advertising Systems being developed by web browsers and operating systems e.g. Google Chrome Privacy Sandbox, Microsoft ASAPI. This work builds upon the [Privacy Sandbox Fit-Gap Analysis](#) published on Jun 27, 2024 .

While largely based on the use cases listed in the original analysis, this document aims to outline specific business and operational functionality necessary to successfully run an advertising business, specifically programmatically. Use cases that were not contemplated in the original or required atomic pieces to all be supported were broken out into distinct use cases. Each item listed is a requirement on its own in addition to being the component parts of functionality necessary to support other listed requirements. This list is not exhaustive and certainly does not create full parity with today's functionality, but does try to encapsulate what is needed to perform necessary business functions like basic auction mechanics, billing, fraud detection, and brand suitability among other things. We describe each requirement as use cases and organize them based on their priority.

This document is developed by the IAB Tech Lab [Privacy Sandbox Task Force](#).

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About IAB Tech Lab

The IAB Technology Laboratory is a nonprofit research and development consortium charged with producing and helping companies implement global industry technical standards and solutions. The goal of the Tech Lab is to reduce friction associated with the digital advertising and marketing supply chain while contributing to the safe growth of an industry.

The IAB Tech Lab spearheads the development of technical standards, creates and maintains a code library to assist in rapid, cost-effective implementation of IAB standards, and establishes a test platform for companies to evaluate the compatibility of their technology solutions with IAB standards, which for 18 years have been the foundation for interoperability and profitable growth in the digital advertising supply chain. Further details about the IAB Technology Lab can be found at <https://iabtechlab.com>.

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Glossary

Term	Description
<i>Brand Safety</i>	The process of evaluating the content of a publisher's page or domain to determine if it's suitable for a brand. Many brands have strict requirements on where they don't want their brand creatives to show up.
<i>Cost Per Action (CPA)</i>	A pricing model in which advertisers are charged only when a specific action is completed by a user after interacting with an ad.
<i>Deals</i>	Curated or exclusive access, or preferred pricing for buyers on subsets of inventory from one or more publishers. Also referred to as "deals" or "programmatic deals," agreements for PMPs can be organized between publishers or SSPs and DSPs, agencies or advertisers.
<i>Demand Side Platform (DSP)</i>	Entity servicing advertisers which bids on advertising opportunities presented by an SSP or (sometimes) a header bidding solution.
<i>Event-Level Notifications</i>	Notifications sent from the browser to advertisers, publishers, or their vendors in non-aggregated, non-noised format. These notifications can include additional dimensions such as campaign id, creative id, etc.
<i>Non-Human Traffic</i>	Traffic generated by automated sources such as bots, spiders, or crawlers rather than real human users.
<i>Open Real-Time Bidding (OpenRTB or RTB)</i>	Most widely used protocol for managing ad requests and auction bidding between SSPs and DSPs and Header Bidding Systems.
<i>Page Zone</i>	A portion of a page in a browser that contains a group related content elements.
<i>Pod Bidding</i>	A technique primarily used in video and connected TV (CTV) advertising that allows multiple ads to be auctioned and served within a single ad break.
<i>Privacy Sandbox (PS)</i>	Google Privacy initiative to phase out third party cookies and replace with privacy enhancing technologies and limit the information websites and other code on page can collect from the browser. It also includes APIs for enabling digital advertising and measurement of digital ads with privacy constraints.
<i>Quality Assurance (QA)</i>	The process of validating that a certain ad creative meets publisher quality standards. Ensures that the creative does not include malicious code, malware, or inappropriate content.
<i>Real Time</i>	Real-time simply refers to the actual time during which something happens. In the context of computers and technology, real-time often refers to systems that process and respond to information or events with minimal delay. This typically means within milliseconds or microseconds, which is fast enough to seem instantaneous to

Term	Description
	humans. Some processes require even faster responses measured in nanoseconds or picoseconds.
<i>Reconciliation</i>	The process of comparing reports between buyers and sellers, identifying discrepancies, and resolving the context in which those discrepancies are happening. Important to resolve issues such as broken creatives, bad placements, and other issues.
<i>Return on Ad Spend (ROAS)</i>	A performance metric in digital advertising that measures the revenue generated for every dollar spent on an ad campaign.
<i>Secure HTML Ad Richmedia Container (SHARC)</i>	A secure container API for managed communication between an app webview or webpage and a served ad creative.
<i>Supply Side Platform (SSP)</i>	Entity servicing publishers, responsible for receiving ad requests from publishers or publisher header bidding systems, requesting bids from DSPs and running an auction to determine the ad to show, or respond with a bid to the header bidding system.
<i>Trusted Execution Environment (TEE)</i>	A Trusted Execution Environment is a secure environment where code is executed and data is processed in an isolated private server that is inaccessible to external parties. The technology protects data by ensuring no other application can access it, and both insider and outsider threats can't compromise it
<i>Trusted Signals</i>	A signal or piece of information that is given directly by the browser and cannot be changed or tampered with.
<i>Video Ad-Serving Template (VAST)</i>	A standard developed by the IAB TechLab that is used to deliver and measure video creatives.

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Overview

This document is the result of collaboration between major AdTech stakeholders including publishers to outline essential requirements for a proprietary advertising system that performs the tasks of an ad server, a bidding exchange and measurement. These requirements are aimed at clearly outlining minimum requirements necessary to run programmatic advertising campaigns

The use cases are separated by priority as follows:

Priority 0 is the highest and most critical priority and use cases within this category are related to either legal compliance, loss of significant revenue, and/or billing in a party/counterparty relationship.

Priority 1 use cases are important functions that are needed for revenue reporting, troubleshooting, rendering ad creatives, quality assurance, and/or fraud prevention.

Compliance and Consent

Compliance with all regulatory requirements, including but not limited to Sarbanes Oxley(SOX) in the United States, the Digital Services Act (DSA) in the UK, and the various global privacy laws is prioritized above all other functionality. Any advertising system must at the very least fully support mechanisms for transmitting and logging any and all signals that would be needed for an audit performed by a regulator in any jurisdiction where the ad system users do business. Auction Dynamics and Transparency

Several requirements focus on improving transparency and quality assurance during an auction. These include exposing full URLs during bid generation to protect brand safety, the use of Seat IDs and Deal IDs for identifying buyers and ensuring deal terms are respected.

Fraud Prevention and Creative Quality Assurance

To protect against non-human traffic and ensure ad quality, the document outlines requirements for fraud detection, such as pre-bid verification of human traffic. Ad creative content must undergo rigorous quality assurance checks to detect malware and ensure compliance with publisher guidelines.

Reporting and Billing

One of the key requirements is the availability of event-level notifications, which are largely absent in most proprietary advertising systems. Proprietary systems that rely on noised, delayed, and/or aggregated results are not sufficient to fully support most use cases .

However, these aggregated reports cannot fully substitute the core advertising functions that event-level notifications provide. Event-level notifications are essential for billing because the billing party needs accurate records for each billable transaction and sellers need to accurately accrue projected revenue. Billing isn't done through approximations; it's processed per transaction, which is crucial for those required to comply with financial reporting regulations. In cases involving billing disputes (e.g., litigation) or troubleshooting, granular event-level logs are also used for reconciliation and debugging.

Event-level notifications are also critical for resolving decision-making issues related to pricing and prioritization of ad opportunities. For example, deals may include guaranteed elements (e.g., a specified number of impressions) where they are required to ensure contractual guarantees are met.

Priority 0 Use Cases

Auction Dynamics

Expose Full URL During Bid Generation

As an advertiser, I want to prevent my ads from showing (or limit my ads to show only) on specific URLs based on custom lists so that my ads appear only in contexts that I have deemed appropriate for my brand

Requirements

- Must allow the buyer (or delegated 3rd party verification vendor) to validate if the URL generating the request is brand safe during bid generation.
- Must allow URL to be validated regardless if the bid generation occurs on-device or server-side
- Must allow the seller to declare a self-reported URL.
- Must include full URL query parameters during validation process.
- Optionally, provide the full page URL as a trusted signal.

Seat IDs

As a seller of ad inventory, I need to identify the entity purchasing the advertising space in my systems so I can maintain an account of the purchaser of the ad inventory

As a purchaser of ad inventory, I need to know my identifier as understood by the seller's system for accounting, running my decision engine and reporting.

Requirements

- Bids must allow for a buyer ID that is known to the seller (aka DSP Seat ID) to be made available to the seller's scoring mechanisms at run time and for reporting in both buyer and seller systems.
- The same seat ID from the DSP that made the bid must be made available to all other APIs used in the auction process.
- Availability of DSP Seat ID should not preclude or reduce the availability of any other information needed to evaluate a bid.
- Must allow usage of Seat ID as a distinct, standalone value, without the reliance on another value such as Deal ID.
- Must allow a declaration of many-to-many relationship for any given Seat ID.
- Must allow declaration of Seat ID at auction time within the bid response.
- The Seat ID from the DSP doing the bidding must be the same DSP Seat ID that the seller used for scoring the bid.
- The Seat ID must be made available for event-level notifications.

Deal IDs

As a seller of ad inventory who has deals in place with buyers of my inventory, I need a mechanism to identify the direct deal from the entity purchasing the advertising space.

As a purchaser of ad inventory who has deals in place with partners and sellers, I need to be able to bid and report on the Deal IDs.

Requirements

- Support sending deal IDs provided by each seller to each buyer, where seller can be any permutation of ad server, SSP, and/or publisher.
- There must be a mechanism by which the buyer is able to communicate to the seller at bid time at a minimum the following attributes for sell-side decisioning: Seat ID + advertiser domain + bid price + deal id.
 - The list is a minimum necessary for reconciliation, but other information may be passed.
 - Any information that influences the fees and/or the billing calculation.
- The same attributes provided by a buyer to a seller for sell-side decisioning (Seat ID + advertiser domain + bid price + deal id) must be made available to both the buyer and the seller in event level reporting.
- The seller must be able to combine bid response attributes related to the commercial terms of the deal (e.g. seat id, advertiser domain, bid price, deal id) with their own attributes (e.g. clearing price) and must be made available to buyer and the seller in event level reporting.
- At run time, information about what Deals are or are not eligible to bid on the inventory must be made available to the buyer.
- Must provide impression level reporting to both buyer and seller on each auction win (reportResult and reportWin).
- Deal can not be disassociated from the bid - If the bid is retracted, then everything about the bid should be retracted.
- Every bid with a deal must be associated with one and only Deal ID in the bid response.

Reporting

Publisher Revenue Accrual and Impression Validation

As a publisher, I need to accurately count the impressions I have served for different advertisers and their buying agents so that I can accrue revenue.

This process is complex and involves multiple parties and stages of the lifecycle of an ad impression. Currently, there are three distinct events that happen during a programmatic based impression lifecycle

- Win notification denoting that the auction was won by a given party
- Impression (via pixel in creative, including vast, etc) denotes that the ad creative was loaded into the browser (though not necessarily shown as it can be pre-cached)

- Billing notification denotes that the ad was actually shown on screen, or that some other billable event has occurred.

Additionally, advertisers may utilize their own vendors to measure the viewability of an ad. These measurement providers are typically embedded into the creative code.

Different parties involved in the ad impression transactions plug into these event sources to receive notifications. The way they plug into the source depends on where they sit within the programmatic request chain.

Here we focus on simple impression counting when an auction was won and subsequently the creative was loaded into the browser. That is the current definition of an impression.

Event-level logs are required to contain only data necessary for billing as provisioned to the appropriate teams.

Requirements

- Must be able to independently receive an impression notification.
- Must not rely on a third party to inject or trigger. Must be able to independently fire notification.
- Must be received in near real time.
- Must be event-level and not aggregated.
- Must be joinable with other notifications for the same impression sent to other parties in the same auction.
- Must be able to include additional reporting dimensions such as host domain and information provided by the seller who initiated the auction.
- Must not truncate or modify CPM values in any way, e.g. should be the exact same as the final price to be paid for the impression (clearing price).
- Participants working with other parties must be able to allow parties they do business with to inject additional notification urls that can include the same reporting dimensions as other notification urls.
- Must support contracts used for the data exchanges which define the obligations placed on each of the parties.

Billable Metrics: CPA

As an advertiser, I want to count user actions such as view-through conversions so I can accurately pay the sellers of ad inventory.

Requirements

- Must be accurate and without noise.
- Must be event-level to enable financial reporting compliance audits.
- Must include sales value to compute ROAS.
- Must include the publisher that delivered the conversion.
- Must allow for multiple parties to independently reconcile reports.

Compliance

Consent Signal Propagation

As a receiver of consent signals from the user, I want to pass that information to my downstream partners in the auction and downstream processing of the ad impression transaction, for e.g. measurement.

Requirements

- Must allow vendors embedded in ad creatives access to read consent signals.
- Must allow vendors embedded in ad creatives to send the consent signal they receive to any downstream vendors they call.
- Must allow any party receiving the consent signal to log consent in case of regulator audit.

Receive & Show Transparency Information as Required by Digital Services Act

As a publisher who is an Online Platform, as defined by the [Digital Services Act \(DSA\)](#), who wants to render DSA transparency to the end user, I want to display required transparency information to the person viewing the ad or receive the transparency information for my own records.

The buyer or DSP must be able to pass this information to the publisher. The required information is about what data was used to make the decision to purchase the impression and therefore can only be provided by the buyer and it must be available for display at render time, so it must be available to the renderer at time of render.

It may also be required by the publisher for record keeping and in those cases it must be available to the publisher.

Some mechanism is needed to pass the transparency information from the buyer to the renderer and publisher.

More information on how this works in OpenRTB can be found [here](#).

Requirements

- Must allow publisher to signal to bidders if DSA is required.
- Must allow publisher to define initial DSA metadata (e.g. targeting reason).
- Must allow bidders to define DSA metadata (e.g. advertiser name, targeting reason).
- Must allow publisher to render the DSA transparency information.
- Must allow bidder to render the DSA transparency information.
- Must allow both publisher and bidder DSA transparency information to be merged and rendered.

- Must allow online platform to have access to information (e.g. transparency data, creative id, impression id) to prove compliance.

Priority 1 Use Cases

Audience Management

User Action Based Exclusion Targeting

As an advertiser, I want to avoid serving ads to users who have completed a certain action so that I can avoid waste in advertising spend as well as not annoy a user with repetitive redundant call to action. For example, a user who has already purchased a product. For more information see the “Exclusion Targeting” use case in the [Fit-Gap Analysis](#) document.

Requirements

- Must allow flagging a user-agent arbitrarily on any domain for exclusion targeting.
- Must persist flag value, even when the user-agent visits another domain.
- Must have a mechanism to avoid serving certain creatives to flagged user-agents when bidding.
- Must allow granular control of which creatives should be excluded.

Auction Dynamics

“No Bid” Response

As a seller, I want to get reports on how many times my bid requests received no bids from a given buyer so that I can maximize my revenue by identifying areas for improvement in problematic inventory, ad quality, demand partner performance etc. or address technical issues.

Requirements

- Must allow bidders to respond with a dedicated no-bid signal.
- Must allow no-bid signal to include reason.
- Must allow sellers to determine when a bidder explicitly chose to not bid.
- Must allow sellers to receive no-bid reports with the same granularity and frequency as bid reporting (event level, aggregated).

Ability to Detect Non-Human Traffic Prior to Bidding

As a buyer, or their fraud measurement/verification provider, I want to make sure bidding does not happen on auctions that are triggered by a non-human operator.

As a seller, or their fraud measurement/verification provider, I want to make sure I don't initiate bid requests if the user-agent is driven by a non-human operator.

Requirements

- Must provide signals necessary to determine bid or page request is from non-human source (e.g. IP, Page URL/Referrer and/or provide a non-personalized cryptographic attestation token).
- In case of attestation token
 - Must allow attestation tokens to be verified by the buyer/seller or their measurement/verification provider and not vulnerable to client-side tampering.
- In case of additional signals
 - Must provide an user-agent like signal that denotes if a request is coming from a headless agent.
 - Must provide a mechanism to determine if a user-agent is legitimate (e.g. an actual user-agent that exists).
- Must allow retention of signals to detect invalid traffic in future auction requests to ensure that once one bot has been identified, there is knowledge to ignore future requests without having to run duplicative origin analysis.

Simple Frequency Capping

As an advertiser, I want to be able to control the number of times an ad creative that is part of a campaign is shown to a user within a given timeframe to maximize return on ad spend

Requirements

- Must provide some mechanism that allows a bidder to exclude ads that a user has already seen in accordance with the frequency cap from participating in the auction.
- Must be able to enable frequency capping with no other targeting (e.g. 10x per day, no more than 3x per hour).
- Must work across domains.
- Must work within a group of domains for a single publisher.
- Must work in standalone without the need to run an auction.
- Must be available to the ad decision system *before* they choose to participate in an auction.

Reporting

Bid-Loss Reporting

As either a DSP or an advertiser, I want to understand why my bid did not win to inform and optimize my future bidding strategy.

Requirements

- Must make available to the buyer the reason why the buyer did not win a particular auction, along with the reason, bid price, winning price, highest other bid price, and combine it with other important attributes (e.g. creative id) for aggregate reporting.

Measure Post-Render Non-Human Impressions

As a buyer or their fraud measurement/verification provider, I want to be able to measure and report on impressions served to non-human user-agent operators.

Requirements

- Must provide mechanism to gather and analyze signals necessary to determine if impression was served to non-human operator (*specific signals should be left to implementers, but agreed upon payload should not be impeded (e.g. IP, Page URL/Referrer and/or provide an attestation token).
- Must allow measurement/verification provider retention of signals to avoid serving creatives to invalid traffic in future.
- Must allow comparison of pre-bid and post-bid signals for consistency and legitimacy.
- Must provide a mechanism for event level data to be sent to the measurement/provider in which reporting labels can be attached.

Resources

- <https://mediaratingcouncil.org/sites/default/files/Standards/IVT%20Addendum%20Update%20062520.pdf>

Reporting by Creative URL

As a publisher I want to know which creatives are being served to users on my site.

Requirements

- Must be able to send out the creative URL to publishers via aggregated reporting.
- Must allow mechanism to debug issues via event-level notifications.

Reporting by Page URL

As an advertiser I want to know the full page URL my ad was served on so I can determine if my ad appeared next to content I have deemed suitable for my brand and/or verifying other campaign objectives like targeting verification (e.g. validating served to the appropriate audience, ad load variation verification.)

Only debugging, event-level notifications are necessary.

Requirements

- Must be able to send out full page URL to advertisers via aggregated reporting after a creative is served.
- Must include full query parameters.
- Must allow mechanism to debug targeting and serving issues via event-level notifications.

Creative & Rendering

Native Look & Feel

As a seller, I want to be able to serve an ad unit that looks and feels native to the publisher's content.

Requirements

Must allow co-ordinating style information between creative and publisher's property.

Resources

- [OpenRTB Native Ads](#)

Ad Coordination

As a party involved in choosing what ad to show, I want to be able to display multiple ads side-by-side that have variety and optionally do not repeat within a single page zone.

Requirements

- Must allow serving multiple ads in a single zone.
- Must have a mechanism to avoid duplication of ad creatives within a zone.

Resources

- [OpenRTB Pod Bidding](#)

Long Term VAST Support

As an advertiser, I want to deliver a video ad using the VAST standard.

It is acceptable that personable data such as identity related macros are not supported.

Requirements

- Must allow a creative to be declared using VAST XML or URL.
- Must allow seller, buyer, and publishers to inject beacon events (e.g. quartiles, click trackers).
- Must support VAST (2.x, 3.x, 4.x) standard.
- Must allow native look and feel.
- Must allow standard placements: Instream, Accompanying Content, Interstitial, No Content/Standalone (see list linked below for descriptions).
- Must allow video player to support VAST macros.

Resources

- <https://github.com/InteractiveAdvertisingBureau/AdCOM/blob/develop/AdCOM%20v1.0%20FINAL.md#list--plcmt-subtypes---video->

Render Video Ads Without Content

As an advertiser, I want to serve standalone video ads in players without editorial video content. These types of creatives typically auto-close once the ad's video has finished playing.

Requirements

- Must allow a video creative to be rendered in frame alongside content.
- Must allow video creative to auto-play while muted.
- Must allow the frame to automatically be closed when the video finishes playing.

Render Responsive Display Ad on Web

As an advertiser, I want to serve ads that dynamically adjust their size based on the preference of the publisher.

Requirements

- Must allow creative to be initialized to the container's dimensions.
- Must allow creative to be resized to dynamic changes to the container's dimensions which are triggered by the publisher.

Resources

- [SHARC - Placement Change](#)

Ability to Block Creatives Post-Bid for Undesirable Traffic

As a buyer or their fraud measurement/verification provider, I don't want my brand's creative to render on non-human or brand unsafe traffic so that I can avoid ad spend waste.

Requirements

- Must provide mechanism to gather and analyze signals necessary to determine if impression was served to non-human (e.g. IP, Page URL/Referrer and/or provide an attestation token).
 - IP
 - User Agent
 - Other interesting request signals (Language, etc.)
- Must provide a trusted domain URL.
- Must provide a network call for the measurement/verification vendor to determine if brand's ad creative should be blocked.
- Must provide mechanism to modify creative to prevent brand's original ad creative from displaying.

Creative Quality Assurance and Malware in Creatives

As a seller, or their verification provider, I want to be able to inspect the ad content to determine if it meets QA levels such as inspecting for malware.

There should be a mechanism in which the seller, or their verification provider, can download the creative, inspect it, and modify it to inject scripts for inspecting the creative's content and behavior.

Rendering and inspecting can happen within the publisher's page or in a segregated server-side environment.

Requirements

- Must be able to inspect creative markup before it is rendered.
- Must be able to modify creative markup before it is rendered.
- Must be able to inspect a creative after it has been rendered.
- Must be able to inspect attributes to detect malicious and/or malware presence.
 - Javascript behavior
 - Images and text
 - Landing page url
- Must be able to allow or block creatives that have already been inspected.