



# **TPMN Real Time Bidding(RTB) API GUIDE**

Version: 2.0.8

# 1 Introduction

## 1.1 TPMN Open RTB Specifics

### OpenRTB specifics

Tpmn presently supports following [OpenRTB](#) version(s):

- OpenRTB : 2.4
- OpenRTB NativeAd : 1.2

### Limitations imposed on the OpenRTB specs

Tpmn's implementation strictly follows the [OpenRTB specs](#) with following limitations:

- CPM campaigns only.
- Currency: USD only.
- Creative (ad markup) shall be sent by the DSP directly within the bid response.
- One bid per request only. Multiple bid/seat responses won't be accepted.
- Impression and spend reports at the site\_id level are required for the partner's account manage to investigate any discrepancy
- The macros we support are a little different than the ones in the official OpenRTB spec
- We require a few field that are listed as optional in the official OpenRTB spec.
- We require implementation of one of our click macros.
- We need to run a functional test and a latency test before we can begin sending traffic.

## 1.2 Change History

| Version | Date       | Changes  |
|---------|------------|--|
| 1.0.0   | 2014.08.12 | RTB Core API   |
| 1.0.1   | 2015.07.02 | Added support for Second Price Auction<br>Added App Object<br>Added Regulations Object<br>Added sections "Implementation Notes"<br>Updated for MACRO<br>Updated Impression Object<br>Updated sections "Reference Lists/Enumerations"<br>Deprecated bid response field : nurl |
| 1.0.2   | 2015.07.14 | Updated Device Object  |
| 1.0.3   | 2015.07.27 | Updated Bug fix  |
| 1.0.4   | 2016.05.18 | Added Publisher Object   |
| 2.0.0   | 2016.10.27 | Release of OpenRTB 2.4   |
| 2.0.1   | 2017.02.20 | Updated Bug fix  |
| 2.0.2   | 2017.07.31 | Updated NativeAd Object  |
| 2.0.3   | 2017.08.01 | Updated Native Object(ver)   |
| 2.0.4   | 2018.10.01 | Updated Bug fix  |

|       |             |   |
|-------|-------------|---|
| 2.0.5 | 2019.07.29  | Updated for Gdpr. Mandatory modification: tagid |
| 2.0.6 | 2020.02.26  | Updated for NativeAd Object(Ver)                |
| 2.0.7 | 2020.04.06. | Updated for CCPA                                |
| 2.0.8 | 2021.02.01. | Updated for VideoAd                             |

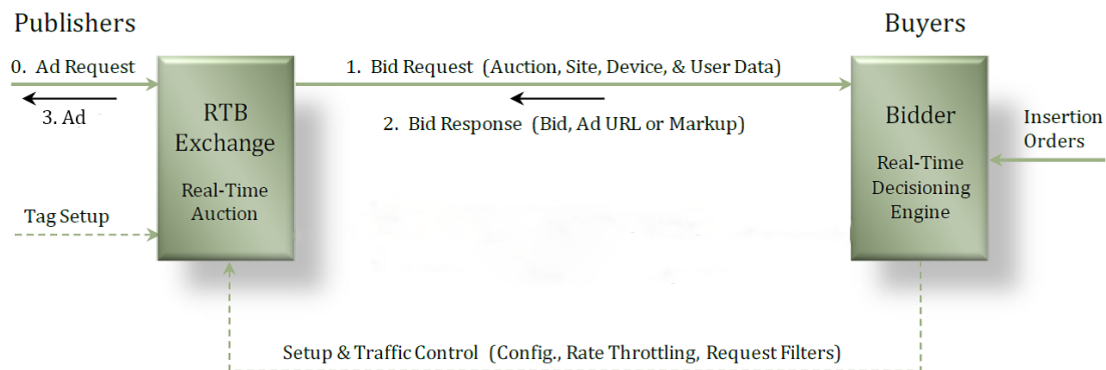
### 1.3 TPMN Real Time Bidding API

TPMN's RTB API enables ad networks, demand side platforms, and other inventory buyers (collectively "Demand Partners") to bid dynamically for each advertising impression, as it is served to users in real time. The process by which these advertising impressions are delivered through RTB works as follows:

1. Ad impression request comes to TPMN from the user's browser.
2. TPMN applies any pre-filters that have been requested by the Demand Partner.
3. TPMN would make real-time API calls to matching Demand Partners giving all the details about the impression. These details are called "Data Parameters" in this document
4. Demand Partner uses the API request Data Parameters to determine the best available advertisement for that inventory and sends back the bid value to TPMN as an API response.
5. TPMN's technology performs an auction among the RTB bids, and other campaigns in the TPMN platform that are eligible for the advertising impression and determines the winning bid by choosing the bid representing the highest CPM for that impression.
6. If the RTB Demand Partner wins the impression, TPMN sends the winning ad URL to the user's browser.
7. The user's browser then directly draws down the winning Advertiser creative.

## 2.RTB Basics

The following figure illustrates the OpenRTB interactions between an exchange and its bidders. Ad requests originate at publisher sites. For each inbound ad request, bid requests are broadcast to bidders, responses are evaluated under prevailing auction rules, the winner is notified, and ad markup is returned. This specification focuses on the real-time interactions of bid request and response



### 2.1 Transport

The base protocol between an exchange and its bidder is HTTP. Specifically, HTTP POST is required for bid requests to accommodate greater payloads than HTTP GET and facilitate the use of binary representations. All calls should return HTTP code 200 except for an empty bid response (i.e., the recommended method of specifying "no bid"), which should return HTTP code 204. Invalid calls (e.g., a bid request containing a malformed or corrupt payload) should return HTTP 400 with no content.

### 2.2 Security

Supporting both HTTP and HTTPS

### 2.3 Data Format

JSON (JavaScript Object Notation) is the used format for bid request and bid response data payloads.

### 3. Bid Request Details

RTB transactions are initiated when an exchange or other supply source sends a bid request to a bidder. The bid request consists of a bid request object, at least one impression object, and may optionally include additional objects providing impression context.

#### 3.1 Object List and Model

Following is the object list for the bid request. Click on the object name to jump to the object definition

| Object     | Section | Description   |
|------------|---------|---|
| bidrequest | 3.2.1   | Top-level object.   |
| imp        | 3.2.2   | Container for the description of a specific impression; at least 1 per request. |
| banner     | 3.2.3   | Details for a banner impression (incl. in-banner video) or video companion ad.  |
| video      | 3.2.4   | Details for a video impression  |
| audio      | 3.2.5   | Container for an audio impression   |
| native     | 3.2.6   | Container for a native impression conforming to the Dynamic Native Ads API.     |
| format     | 3.2.7   | An allowed size of a banner.  |
| site       | 3.2.8   | Details of the website calling for the impression.                              |
| app        | 3.2.9   | Details of the application calling for the impression.                          |
| publisher  | 3.2.10  | Entity that controls the content of and distributes the site or app.            |
| content    | 3.2.11  | Details about the published content itself, within which the ad will be shown.  |
| producer   | 3.2.12  | Producer of the content; not necessarily the publisher (e.g., syndication).     |
| device     | 3.2.13  | Details of the device on which the content and impressions are displayed.       |
| geo        | 3.2.14  | Location of the device or user's home base depending on the parent object.      |
| user       | 3.2.15  | Human user of the device; audience for advertising                              |
| data       | 3.2.16  | Collection of additional user targeting data from a specific data source.       |
| segment    | 3.2.17  | Specific data point about a user from a specific data source..                  |
| regs       | 3.2.18  | Regulatory conditions in effect for all impressions in this bid request.        |
| pmp        | 3.2.19  | Collection of private marketplace (PMP) deals applicable to this impression.    |
| deal       | 3.2.20  | Deal terms pertaining to this impression between a seller and buyer.            |

## 3.2 Object Definitions

Following are definitions of the various objects involved in a bid request.

### 3.2.1 Object: bidrequest

| Attribute | Always Passed                  | Description   |
|-----------|--------------------------------|---|
| id        | Yes                            | Unique ID of the bid request, provided by the exchange (this is the field that is mapped to "id" in bid response)   |
| imp       | Yes                            | Array of Imp objects (Section 3.2.2) representing the impressions offered. At least 1 Imp object is required.   |
| site      | No (either site or app always) | Details via a Site object (Section 3.2.8) about the publisher's website. Only applicable and recommended for websites.  |
| app       | No (either site or app always) | Details via an App object (Section 3.2.9) about the publisher's app (i.e., non-browser applications). Only applicable and recommended for apps.   |
| device    | Yes                            | Details via a Device object (Section 3.2.13) about the user's device to which the impression will be delivered.   |
| user      | No                             | Details via a User object (Section 3.2.15) about the human user of the device; the advertising audience.  |
| test      | Yes                            | Indicator of test mode in which auctions are not billable, where 0 = live mode, 1 = test mode, default : 0  |
| at        | Yes                            | Auction Type. Currently always 2 (second price)   |
| tmax      | Yes                            | Maximum time in milliseconds to submit a bid to avoid timeout. This value is commonly communicated offline.   |
| whseat    | n/a                            | Whitelist of buyer seats (e.g., advertisers, agencies) allowed to bid on this impression. IDs of seats and knowledge of the buyer's customers to which they refer must be coordinated between bidders and the exchange <i>a priori</i> . Omission implies no seat restrictions.                                   |
| allimps   | n/a                            | Flag to indicate if Exchange can verify that the impressions offered represent all of the impressions available in context (e.g., all on the web page, all video spots such as pre/mid/post roll) to support road blocking. 0 = no or unknown, 1 = yes, the impressions offered represent all that are available. |
| cur       | n/a                            | Array of allowed currencies for bids on this bid request using ISO-4217 alpha codes. Recommended only if the exchange accepts multiple currencies.  |
| bcat      | No                             | Blocked advertiser categories using the IAB content categories. Refer to List 5.1.  |
| badv      | No                             | Block list of advertisers by their domains (e.g., "ford.com").  |

|      |     |  |
|------|-----|--|
| bapp | n/a | Block list of applications by their platform-specific exchange-independent application identifiers. On Android, these should be bundle or package names (e.g., com.foo.mygame). On iOS, these are numeric IDs. |
| regs | No  | A Regs object (Section 3.2.18) that specifies any industry, legal, or governmental regulations in force for this request.  |
| ext  | n/a | Placeholder for exchange-specific extensions to OpenRTB.   |

### 3.2.2 Object : imp

| Attribute         | Always Passed        | Description   |
|-------------------|----------------------|---|
| id                | Yes                  | A unique identifier for this impression within the context of the bid request (typically, starts with 1 and increments).  |
| banner            | Only for banner imps | A <code>Banner</code> object (Section 3.2.3); required if this impression is offered as a banner ad opportunity.  |
| video             | Only for video imps  | A <code>Video</code> object (Section 3.2.4); required if this impression is offered as a video ad opportunity.  |
| audio             | Only for audio imps  | An <code>Audio</code> object (Section 3.2.5); required if this impression is offered as an audio ad opportunity.  |
| native            | Only for native imps | A <code>Native</code> object (Section 3.2.6); required if this impression is offered as a native ad opportunity.  |
| pmp               | No                   | A <code>Pmp</code> object (Section 3.2.19) containing any private marketplace deals in effect for this impression.  |
| displaymanager    | No                   | Will pass “tpmn” when the sdk is present  |
| displaymanagerver | No                   | TPMN SDK version passed from the SDK, otherwise not passed  |
| instl             | Yes                  | 1 = the ad is interstitial or full screen, 0 = not interstitial.  |
| tagid             | Yes                  | Identifier for specific ad placement or ad tag that was used to initiate the auction. This can be useful for debugging of any issues, or for optimization by the buyer.   |
| bidfloor          | No                   | Minimum bid for this impression expressed in CPM.   |
| bidfloorcur       | Yes                  | Currently always “USD”  |
| clickbrowser      | No                   | Indicates the type of browser opened upon clicking the creative in an app, where 0 = embedded, 1 = native. Note that the Safari View Controller in iOS 9.x devices is considered a native browser for purposes of this attribute. |
| secure            | Yes                  | Flag to indicate if the impression requires secure HTTPS URL creative assets and markup, where 0 = non-secure, 1 = secure. If omitted, the secure state is unknown, but non-secure HTTP support can be assumed.                   |

|              |     |   |
|--------------|-----|---|
| iframebuster | n/a | Array of exchange-specific names of supported iframe busters.                                       |
| exp          | No  | Advisory as to the number of seconds that may elapse between the auction and the actual impression. |
| ext          | n/a | Placeholder for exchange specific extensions to OpenRTB.  |

### 3.2.3 Object : banner

| Attribute | Always Passed | Description   |
|-----------|---------------|---|
| w         | Yes           | Width in device independent pixels (DIPS).<br>If no <code>format</code> objects are specified, this is an exact width requirement. Otherwise it is a preferred width.   |
| h         | Yes           | Height in device independent pixels (DIPS).<br>If no <code>format</code> objects are specified, this is an exact height requirement. Otherwise it is a preferred height.  |
| format    | No            | Array of format objects (Section 3.2.7) representing the banner sizes permitted. If none are specified, then use of the <code>h</code> and <code>w</code> attributes is highly recommended.   |
| wmax      | n/a           | <del>Maximum width in device independent pixels (DIPS).</del>   |
| hmax      | n/a           | <del>Maximum height in device independent pixels (DIPS).</del>  |
| wmin      | n/a           | <del>Minimum width in device independent pixels (DIPS).</del>   |
| hmin      | n/a           | <del>Minimum height in device independent pixels (DIPS).</del>  |
| id        | n/a           | Unique identifier for this banner object. Recommended when <del>Banner</del> objects are used with a Video object (Section 3.2.4) to represent an array of companion ads. Values usually start at 1 and increase with each object; should be unique within an impression. |
| btype     | Yes           | Blocked banner ad types. Refer to List 5.2.   |
| battr     | Yes           | Blocked creative attributes. Refer to List 5.3.   |
| pos       | Yes           | Ad position on screen. Refer to List 5.4.   |
| mimes     | n/a           | <del>Content MIME types supported. Popular MIME types may include “application/x-shockwave-flash”, “image/jpeg”, and “image/gif”.</del>   |
| topframe  | No            | Indicates if the banner is in the top frame as opposed to an iframe, where 0 = no, 1 = yes.   |
| expdir    | n/a           | <del>Directions in which the banner may expand. Refer to List 5.5.</del>  |
| api       | No            | List of supported API frameworks for this impression. Refer to List 5.6. If an API is not explicitly listed, it is  |



|     |     |  |
|-----|-----|--|
|     |     | assumed not to be supported.                             |
| ext | n/a | Placeholder for exchange-specific extensions to OpenRTB. |

### 3.2.4 Object : video

| Attribute   | Scope       | Type          | Description  |
|-------------|-------------|---------------|--|
| mimes       | required    | String array  | Content MIME types supported. Popular MIME types may include “video/x-ms-wmv” for Windows Media and “video/x-flv” for Flash Video.   |
| minduration | recommended | integer       | Minimum video ad duration in seconds.  |
| maxduration | recommended | integer       | Maximum video ad duration in seconds.  |
| protocols   | recommended | integer array | Array of supported video protocols. Refer to List 5.8. At least one supported protocol must be specified in either the <code>protocol</code> or <code>protocols</code> attribute.  |
| w           | recommended | integer       | Width of the video player in device independent pixels (DIPS).   |
| h           | recommended | integer       | Height of the video player in device independent pixels (DIPS).  |
| startdelay  | recommended | integer       | Indicates the start delay in seconds for pre-roll, mid-roll, or post-roll ad placements. Refer to List 5.10 for additional generic values.   |
| linearity   | optional    | integer       | Indicates if the impression must be linear, nonlinear, etc. If none specified, assume all are allowed. Refer to List 5.7.  |
| skip        | optional    | integer       | Indicates if the player will allow the video to be skipped, where 0 = no, 1 = yes.<br>If a bidder sends markup/creative that is itself skippable, the Bid object should include the <code>attr</code> array with an element of 16 indicating skippable video. Refer to List 5.3.                         |
| skipmin     | optional    | integer       | Videos of total duration greater than this number of seconds can be skippable; only applicable if the ad is skippable.   |
| skipafter   | optional    | integer       | Number of seconds a video must play before skipping is enabled; only applicable if the ad is skippable.  |
| sequence    | optional    | integer       | If multiple ad impressions are offered in the same bid request, the sequence number will allow for the coordinated delivery of multiple creatives.   |
| battr       | optional    | integer array | Blocked creative attributes. Refer to List 5.3.  |
| maxextended | optional    | integer       | Maximum extended ad duration if extension is allowed. If blank or 0, extension is not allowed. If -1, extension is allowed, and there is no time limit imposed. If greater than 0, then the value represents the number of seconds of extended play supported beyond the <code>maxduration</code> value. |
| minbitrate  | optional    | integer       | Minimum bit rate in Kbps.  |
| maxbitrate  | optional    | integer       | Maximum bit rate in Kbps.  |

|                |          |               |  |
|----------------|----------|---------------|--|
| boxingallowed  | optional | integer       | Indicates if letter-boxing of 4:3 content into a 16:9 window is allowed, where 0 = no, 1 = yes.  |
| playbackmethod | optional | integer array | Playback methods that may be in use. If none are specified, any method may be used. Refer to List 5.9. Only one method is typically used in practice. As a result, this array may be converted to an integer in a future version of the specification. |
| delivery       | optional | integer array | Supported delivery methods (e.g., streaming, progressive). If none specified, assume all are supported. Refer to List 5.13.  |
| pos            | optional | integer       | Ad position on screen. Refer to List 5.4.  |
| companionad    | optional | object array  | Array of <code>Banner</code> objects (Section 3.2.3) if companion ads are available.   |
| api            | optional | integer array | List of supported API frameworks for this impression. Refer to List 5.6. If an API is not explicitly listed, it is assumed not to be supported.  |
| companiontype  | optional | integer array | Supported VAST companion ad types. Refer to List 5.12. Recommended if companion <code>Banner</code> objects are included via the <code>companionad</code> array.   |
| ext            | optional | object        | Placeholder for exchange-specific extensions to OpenRTB.   |

#### 3.2.4.1 Object : video.ext

| Attribute | Scope    | Type    | Description  |
|-----------|----------|---------|--|
| rewarded  | required | integer | Indicates whether the ad is being rendered as part of a rewarded / incentivised user experience, where: <ul style="list-style-type: none"> <li>0 : non-rewarded</li> <li>1 : rewarded</li> <li>If omitted, non-rewarded can be assumed.</li> </ul> |
| skippable | optional | integer | Indicates whether the video ad may be skippable(i.e. contain a skip button). The values are: <ul style="list-style-type: none"> <li>0 : allow skippable</li> <li>1 : require skippable</li> <li>2 : deny skippable</li> </ul>                      |
| outstream | optional | integer | Indicates that the video is outstream, for example 1 <ul style="list-style-type: none"> <li>0 : no outstream</li> <li>1 : outstream</li> </ul>   |

#### 3.2.5 Object :audio

| Attribute | Always Passed | Description |
|-----------|---------------|-------------|
|-----------|---------------|-------------|

|               |     |   |
|---------------|-----|---|
| mimes         | Yes | Content MIME types supported. Popular MIME types may include “video/x-ms-wmv” for Windows Media and “video/x-flv” for Flash Video.  |
| minduration   | Yes | Minimum video ad duration in seconds.   |
| maxduration   | No  | Maximum video ad duration in seconds.   |
| protocols     | Yes | Array of supported video protocols. Refer to List 5.8. At least one supported protocol must be specified in either the <code>protocol</code> or <code>protocols</code> attribute.   |
| startdelay    | n/a | Indicates the start delay in seconds for pre-roll, mid-roll, or post-roll ad placements. Refer to List 5.10 for additional generic values.  |
| sequence      | n/a | If multiple ad impressions are offered in the same bid request, the sequence number will allow for the coordinated delivery of multiple creatives.  |
| battr         | No  | Blocked creative attributes. Refer to List 5.3.   |
| maxextended   | n/a | Maximum extended ad duration if extension is allowed. If blank or 0, extension is not allowed. If 1, extension is allowed, and there is no time limit imposed. If greater than 0, then the value represents the number of seconds of extended play supported beyond the <code>maxduration</code> value. |
| minbitrate    | n/a | Minimum bit rate in Kbps.   |
| maxbitrate    | n/a | Maximum bit rate in Kbps.   |
| boxingallowed | n/a | Indicates if letter boxing of 4:3 content into a 16:9 window is allowed, where 0 = no, 1 = yes.   |
| delivery      | n/a | Supported delivery methods (e.g., streaming, progressive). If none specified, assume all are supported. Refer to List 5.13.   |
| pos           | n/a | Ad position on screen. Refer to List 5.4.   |
| companionad   | n/a | Array of <del>Banner</del> objects (Section 3.2.3) if companion ads are available.  |
| api           | No  | List of supported API frameworks for this impression. Refer to List 5.6. If an API is not explicitly listed, it is assumed not to be supported.   |
| companiontype | n/a | Supported VAST companion ad types. Refer to List 5.12. Recommended if companion <del>Banner</del> objects are included via the <del>companionad</del> array.  |
| maxseq        | n/a | The maximum number of ads that can be played in an ad pod.  |
| feed          | n/a | Type of audio feed. Refer to List 5.14.   |
| stitched      | n/a | Indicates if the ad is stitched with audio content or delivered independently, where 0 = no, 1 = yes.   |
| vol           | n/a | Volume normalization mode. Refer to List 5.15.  |
| ext           | n/a | Placeholder for exchange specific extensions to OpenRTB.  |

### 3.2.6 Object : native

| Attribute | Always Passed | Description   |
|-----------|---------------|---|
| request   | Yes           | Request payload complying with the Native Ad Specification.   |
| ver       | No            | Version of the Dynamic Native Ads API to which <code>request</code> complies; highly recommended for efficient parsing.                         |
| api       | n/a           | List of supported API frameworks for this impression. Refer to List 5.6. If an API is not explicitly listed, it is assumed not to be supported. |
| battr     | No            | Blocked creative attributes. Refer to List 5.3.   |
| ext       | n/a           | Placeholder for exchange-specific extensions to OpenRTB   |

### 3.2.7 Object : format

| Attribute | Always Passed | Description   |
|-----------|---------------|---|
| w         | Yes           | Width in device independent pixels (DIPS).              |
| h         | Yes           | Height in device independent pixels (DIPS).             |
| ext       | n/a           | Placeholder for exchange-specific extensions to OpenRTB |

### 3.2.8 Object : site

| Attribute | Always Passed | Description   |
|-----------|---------------|---|
| id        | Yes           | Exchange-specific site ID.                                      |
| name      | Yes           | Site name (may be aliased at the publisher's request).          |
| domain    | Yes           | Domain of the site (e.g., "mysite.foo.com").                    |
| cat       | No            | Array of IAB content categories of the site. Refer to List 5.1. |

|               |     |  |
|---------------|-----|--|
| sectioncat    | n/a | Array of IAB content categories that describe the current section of the site. Refer to List 5.1.                  |
| pagecat       | n/a | Array of IAB content categories that describe the current page or view of the site. Refer to List 5.1.             |
| page          | No  | URL of the page where the impression will be shown.  |
| ref           | No  | Referrer URL that caused navigation to the current page.   |
| search        | n/a | Search string that caused navigation to the current page.  |
| mobile        | No  | Indicates if the site has been programmed to optimize layout when viewed on mobile devices, where 0 = no, 1 = yes. |
| privacypolicy | n/a | Indicates if the site has a privacy policy, where 0 = no, 1 = yes.   |
| publisher     | Yes | Details about the Publisher (Section 3.2.10) of the site.  |
| content       | n/a | Details about the Content (Section 3.2.11) within the site.  |
| keywords      | n/a | Comma-separated list of keywords about the site.   |
| ext           | n/a | Placeholder for exchange-specific extensions to OpenRTB.   |

### 3.2.9 Object : App

| Attribute | Always Passed | Description  |
|-----------|---------------|--|
| id        | Yes           | Exchange-specific app ID.  |
| name      | Yes           | App name (may be aliased at the publisher's request).  |
| bundle    | Yes           | A platform-specific application identifier intended to be unique to the app and independent of the exchange. On Android, this should be a bundle or package name (e.g., com.foo.mygame). On iOS, it is a numeric ID. |
| domain    | No            | Domain of the app (e.g., "mygame.foo.com").  |
| storeurl  | Yes           | App store URL for an installed app; for IQG 2.1 compliance.  |

|               |     |   |
|---------------|-----|---|
| cat           | No  | Array of IAB content categories of the app. Refer to List 5.1.  |
| sectioncat    | n/a | Array of IAB content categories that describe the current section of the app. Refer to List 5.1.      |
| pagecat       | n/a | Array of IAB content categories that describe the current page or view of the app. Refer to List 5.1. |
| ver           | No  | Application version.  |
| privacypolicy | n/a | Indicates if the app has a privacy policy, where 0 = no, 1 = yes.                                     |
| paid          | n/a | 0 = app is free, 1 = the app is a paid version.   |
| publisher     | Yes | Details about the Publisher (Section 3.2.10) of the app.  |
| content       | n/a | Details about the Content (Section 3.2.11) within the app.  |
| keywords      | n/a | Comma-separated list of keywords about the app.   |
| ext           | n/a | Placeholder for exchange-specific extensions to OpenRTB.  |

### 3.2.10 Object : publisher

| Attribute | Always Passed | Description   |
|-----------|---------------|---|
| id        | Yes           | Unique publisher ID of this user on the exchange.                               |
| name      | No            | Publisher name (may be aliased at the publisher's request).                     |
| cat       | n/a           | Array of IAB content categories that describe the publisher. Refer to List 5.1. |
| domain    | n/a           | Highest level domain of the publisher   |
| ext       | n/a           | Placeholder for exchange-specific extensions to OpenRTB.                        |

### 3.2.11 Object : content

| Attribute          | Always Passed | Description   |
|--------------------|---------------|---|
| id                 | n/a           | ID uniquely identifying the content.  |
| episode            | n/a           | Episode number.   |
| title              | n/a           | Content title.<br><i>Video Examples:</i> "Search Committee" (television), "A New Hope" (movie), or "Endgame" (made for web).<br><i>Non-Video Example:</i> "Why an Antarctic Glacier Is Melting So Quickly" (Time magazine article). |
| series             | n/a           | Content series.<br><i>Video Examples:</i> "The Office" (television), "Star Wars" (movie), or "Arby 'N' The Chief" (made for web).<br><i>Non-Video Example:</i> "Ecocentric" (Time Magazine blog).                                   |
| season             | n/a           | Content season (e.g., "Season 3").  |
| artist             | n/a           | Artist credited with the content.   |
| genre              | n/a           | Genre that best describes the content (e.g., rock, pop, etc.).  |
| album              | n/a           | Album to which the content belongs; typically for audio.  |
| isrc               | n/a           | International Standard Recording Code conforming to ISO-3901.   |
| producer           | n/a           | Details about the content <del>Producer</del> (Section 3.2.12).   |
| url                | n/a           | URL of the content, for buy-side contextualization or review.   |
| cat                | n/a           | Array of IAB content categories that describe the content producer. Refer to List 5.1.  |
| prodq              | n/a           | Production quality. Refer to List 5.11.   |
| videoquality       | n/a           | Video quality. Refer to List 5.11.  |
| context            | n/a           | Type of content (game, video, text, etc.). Refer to List 5.16.  |
| contentrating      | n/a           | Content rating (e.g., MPAA).  |
| userrating         | n/a           | User rating of the content (e.g., number of stars, likes, etc.).  |
| qagmediarating     | n/a           | Media rating per IQG guidelines. Refer to List 5.17.  |
| keywords           | n/a           | Comma-separated list of keywords describing the content.  |
| livestream         | n/a           | 0 = not live, 1 = content is live (e.g., stream, live blog).  |
| sourcerelationship | n/a           | 0 = indirect, 1 = direct.   |

|            |     |  |
|------------|-----|--|
| len        | n/a | Length of content in seconds; appropriate for video or audio.  |
| language   | n/a | Content language using ISO-639-1-alpha-2.  |
| embeddable | n/a | Indicator of whether or not the content is embeddable (e.g., an embeddable video player), where 0 = no, 1 = yes. |
| data       | n/a | Additional content data. Each Data object (Section 3.2.16) represents a different data source.                   |
| ext        | n/a | Placeholder for exchange-specific extensions to OpenRTB.   |

### 3.2.12 Object : producer

| Attribute | Always Passed | Description  |
|-----------|---------------|--|
| id        | n/a           | Content producer or originator ID. Useful if content is syndicated and may be posted on a site using embed tags. |
| name      | n/a           | Content producer or originator name (e.g., “Warner Bros”).   |
| cat       | n/a           | Array of IAB content categories that describe the content producer. Refer to List 5.1.                           |
| domain    | n/a           | Highest level domain of the content producer (e.g., “producer.com”).   |
| ext       | n/a           | Placeholder for exchange-specific extensions to OpenRTB  |

### 3.2.13 Object : device

| Attribute | Always Passed | Description  |
|-----------|---------------|--|
| ua        | Yes           | Browser user agent string.   |
| geo       | No            | Location of the device assumed to be the user’s current location defined by a Geo object (Section 3.2.14).   |
| dnt       | No            | Standard “Do Not Track” flag as set in the header by the browser, where 0 = tracking is unrestricted, 1 = do not track.  |
| lmt       | No            | “Limit Ad Tracking” signal commercially endorsed (e.g., iOS, Android), where 0 = tracking is unrestricted, 1 = tracking must be limited per commercial guidelines. |



|                    |                |  |
|--------------------|----------------|--|
| ip                 | Yes            | IPv4 address closest to device.  |
| ipv6               | n/a            | <del>IP address closest to device as IPv6.</del>   |
| devicetype         | No             | The general type of device. Refer to List 5.19.  |
| make               | No             | Device make (e.g., “Apple”).   |
| model              | No             | Device model (e.g., “iPhone”).   |
| os                 | No             | Device operating system (e.g., “iOS”).   |
| osv                | No             | Device operating system version (e.g., “3.1.2”).   |
| hwv                | No             | Hardware version of the device (e.g., “5S” for iPhone 5S).   |
| h                  | No             | Physical height of the screen in pixels  |
| w                  | No             | Physical width of the screen in pixels.  |
| ppi                | n/a            | <del>Screen size as pixels per linear inch.</del>  |
| pxratio            | n/a            | <del>The ratio of physical pixels to device independent pixels.</del>  |
| js                 | Yes            | Support for JavaScript, where 0 = no, 1 = yes.<br>Always = 1   |
| geofetch           | n/a            | <del>Indicates if the geolocation API will be available to JavaScript code running in the banner, where 0 = no, 1 = yes.</del>   |
| flashver           | n/a            | <del>Version of Flash supported by the browser.</del>  |
| language           | No             | Browser language using ISO-639-1-alpha-2.  |
| carrier            | No             | Carrier or ISP (e.g., “VERIZON”). “WIFI” is often used in mobile to indicate high bandwidth (e.g., video friendly vs. cellular). |
| connectiontype     | No             | Network connection type. Refer to List 5.20.   |
| lfa                | No             | ID sanctioned for advertiser use in the clear (i.e., not hashed).  |
| <del>didsha1</del> | <del>n/a</del> | <del>Hardware device ID (e.g., IMEI); hashed via SHA1.</del>   |

|          |     |   |
|----------|-----|---|
| didmd5   | n/a | Hardware device ID (e.g., IMEI); hashed via MD5.        |
| dpidsha1 | n/a | Platform device ID (e.g., Android ID); hashed via SHA1. |
| dpidmd5  | n/a | Platform device ID (e.g., Android ID); hashed via MD5.  |
| macsha1  | n/a | MAC address of the device; hashed via SHA1.             |
| macmd5   | n/a | MAC address of the device; hashed via MD5.              |
| ext      | n/a | Placeholder for exchange-specific extensions to OpenRTB |

### 3.2.14 Object : geo

| Attribute     | Always Passed | Description  |
|---------------|---------------|--|
| lat           | Yes           | Latitude from -90.0 to +90.0, where negative is south.   |
| lon           | Yes           | Longitude from -180.0 to +180.0, where negative is west.   |
| type          | No            | Source of location data; recommended when passing lat/lon. Refer to List 5.18.   |
| accuracy      | n/a           | Estimated location accuracy in meters; recommended when lat/lon are specified and derived from a device's location services (i.e., type = 1). Note that this is the accuracy as reported from the device. Consult OS specific documentation (e.g., Android, iOS) for exact interpretation. |
| lastfix       | n/a           | Number of seconds since this geolocation fix was established. Note that devices may cache location data across multiple fetches. Ideally, this value should be from the time the actual fix was taken.   |
| ipservice     | n/a           | Service or provider used to determine geolocation from IP address if applicable (i.e., type = 2). Refer to List 5.21.  |
| country       | No            | Country code using ISO-3166-1-alpha-3.   |
| region        | No            | Region code using ISO-3166-2; 2-letter state code if USA.  |
| regionfips104 | n/a           | Region of a country using FIPS 10-4 notation. While OpenRTB supports this attribute, it has been withdrawn by NIST in 2008.  |
| metro         | No            | Google metro code; similar to but not exactly Nielsen DMAs. See Appendix A for a link to the codes.  |
| city          | No            | City using United Nations Code for Trade & Transport Locations. See Appendix A for a link to the codes.  |
| zip           | No            | Zip or postal code.  |
| utcoffset     | n/a           | Local time as the number +/- of minutes from UTC.  |

|     |     |  |
|-----|-----|--|
| ext | n/a | Placeholder for exchange-specific extensions to OpenRTB. |
|-----|-----|--|

### 3.2.15 Object : user

| Attribute  | Always Passed | Description   |
|------------|---------------|---|
| id         | Yes           | Exchange-specific ID for the user. At least one of <code>id</code> or <code>buyerid</code> is recommended.  |
| buyerid    | No            | Buyer-specific ID for the user as mapped by the exchange for the buyer. At least one of <code>buyerid</code> or <code>id</code> is recommended.   |
| yob        | No            | Year of birth as a 4-digit integer.   |
| gender     | No            | Gender, where "M" = male, "F" = female, "O" = known to be other (i.e., omitted is unknown).   |
| keywords   | No            | Comma separated list of keywords, interests, or intent.   |
| customdata | n/a           | Optional feature to pass bidder data that was set in the exchange's cookie. The string must be in base85 cookie-safe characters and be in any format. Proper JSON encoding must be used to include "escaped" quotation marks. |
| geo        | No            | Location of the user's home base defined by a <code>Geo</code> object (Section 3.2.14). This is not necessarily their current location.   |
| data       | No            | Additional user data. Each <code>Data</code> object (Section 3.2.16) represents a different data source.  |
| ext        | No            | Placeholder for exchange-specific extensions to OpenRTB.  |

#### 3.2.15.1 Object : user.ext

| Attribute | Always Passed | Description   |
|-----------|---------------|---|
| consent   | No            | Declaration that the user has consented to having his or her data collected by the publisher's site, as mandated by the GDPR. |

### 3.2.16 Object : data

| Attribute | Always Passed | Description   |
|-----------|---------------|---|
| id        | No            | Exchange-specific ID for the data provider.   |
| name      | No            | Exchange-specific name for the data provider.   |
| segment   | No            | Array of <code>Segment</code> (Section 3.2.17) objects that contain the actual data values. |
| ext       | n/a           | Placeholder for exchange-specific extensions to OpenRTB.                                    |

### 3.2.17 Object : segment

| Attribute | Always Passed | Description  |
|-----------|---------------|--|
| id        | No            | ID of the data segment specific to the data provider.    |
| name      | No            | Name of the data segment specific to the data provider.  |
| Value     | No            | String representation of the data segment value.         |
| ext       | n/a           | Placeholder for exchange-specific extensions to OpenRTB. |

### 3.2.18 Object : regs

| Attribute | Always Passed | Description   |
|-----------|---------------|---|
| coppa     | Yes           | Flag indicating if this request is subject to the COPPA regulations established by the USA FTC, where 0 = no, 1 = yes. Refer to Section 7.5 for more information. |
| ext       | No            | Placeholder for exchange-specific extensions to OpenRTB.  |

#### 3.2.18.1 Object : regs.ext

| Attribute  | Always Passed | Description  |
|------------|---------------|--|
| gdpr       | No            | Indicates whether the request is subject to the General Data Protection Regulation (GDPR)<br>0 = false<br>1 = true (the request is subject to GDPR).   |
| us_privacy | No            | <p>Passes the user privacy status for requests which fall under <a href="#">CCPA</a> regulations. The string uses 4 characters, e.g. "1YN-", passed in the following order.</p> <ol style="list-style-type: none"><li><b>Version Number</b> The IAB CCPA Specification version that applies to this string, passed as an integer. Currently only 1 is available.</li><li><b>Explicit Notice</b> (N = No, Y = Yes, - = Not Applicable)</li></ol> <p>Indicates whether explicit notice has been provided to the user as required by 1798.115 (d) of the CCPA and whether they have had the opportunity to opt-out of the sale of their data pursuant to 1798.120 and 1798.135 of the CCPA.</p> |

|  |  |   |
|--|--|---|
|  |  | <p>3. <b>Opted-Out</b> (N = No, Y = Yes, - = Not Applicable)<br/>Indicates whether the user has opted-out of the sale of their personal information pursuant to 1798.120 and 1798.135.</p> <p>4. <b>LSPA</b> (N = No, Y = Yes, - = Not Applicable)<br/>Indicates whether the publisher is a signatory to the IAB Limited Service Provider Agreement (LSPA) and that the publisher declares the transaction should be treated as a “Covered Opt Out Transaction” or a “Non Opt Out Transaction” as defined in the agreement.</p> |
|--|--|---|

### 3.2.19 Object : pmp

| Attribute       | Always Passed | Description  |
|-----------------|---------------|--|
| private_auction | Yes           | Indicator of auction eligibility to seats named in the Direct Deals object, where 0 = all bids are accepted, 1 = bids are restricted to the deals specified and the terms thereof. |
| deals           | Yes           | Array of Deal (Section 3.2.20) objects that convey the specific deals applicable to this impression.   |
| ext             | required      | Placeholder for exchange-specific extensions to OpenRTB.   |

### 3.2.20 Object : deal

| Attribute   | Always Passed | Description   |
|-------------|---------------|---|
| id          | Yes           | A unique identifier for the direct deal.  |
| bidfloor    | No            | Minimum bid for this impression expressed in CPM.   |
| bidfloorcur | No            | Currently always “USD”  |
| at          | No            | Optional override of the overall auction type of the bid request, where 1 = First Price, 2 = Second Price Plus, 3 = the value passed in bidfloor is the agreed upon deal price. Additional auction types can be defined by the exchange. Currently always sets at = 2     |
| wseat       | n/a           | Whitelist of buyer seats (e.g., advertisers, agencies) allowed to bid on this deal. IDs of seats and knowledge of the buyer’s customers to which they refer must be coordinated between bidders and the exchange <i>a priori</i> . Omission implies no seat restrictions. |
| wadomain    | No            | Array of advertiser domains (e.g., advertiser.com) allowed to bid on this deal. Omission implies no advertiser restrictions.  |
| ext         | n/a           | Placeholder for exchange-specific extensions to OpenRTB.  |

### 3.2.21 Object : native.request.native

| Attribute      | Always Passed | Description   |
|----------------|---------------|---|
| ver            | Yes           | Version of the Native Markup version in use<br>Currently always set at 1.2  |
| context        | No            | The context in which the ad appears.  |
| contextsubtype | n/a           | A more detailed context in which the ad appears. See Table of Context SubType IDs below for a list of supported context subtypes.                           |
| plcmnttype     | No            | Array of advertiser domains (e.g., advertiser.com) allowed to bid on this deal. Omission implies no advertiser restrictions.                                |
| plcmcnt        | No            | The number of identical placements in this Layout.  |
| seq            | n/a           | 0 for the first ad,1 for the second ad,and so on.   |
| asurlsupport   | n/a           | Whether the supply source / impression supports returning an assetsurl instead of an asset object. 0 or the absence of the field indicates no such support. |
| durlsupport    | n/a           | Whether the supply source / impression supports returning a dco url instead of an asset object.   |
| eventtrackers  | No            | Specifies what type of event tracking is supported  |
| assets         | Yes           | An array of Asset Objects.Any bid response must comply with   |
| privacy        | Yes           | Set to 1 when the native ad supports buyer-specific privacy notice  |

### 3.2.22 Object : native.request.native.assets

| Attribute | Always Passed | Description   |
|-----------|---------------|---|
| id        | Yes           | Unique asset ID, assigned by exchange. Typically a counter for the array  |
| required  | Yes           | Set to 1 if asset is required (exchange will not accept a bid without it)   |
| title     | Yes           | Title object for title assets. See TitleObject definition.  |
| img       | Yes           | Image object for image assets. See ImageObject definition.  |
| video     | No            | Video object for video assets. See the Video request object definition. Note that in-stream (ie preroll, etc) video ads are not part of Native. Native ads may contain a video as the ad creative itself. |
| data      | Yes           | Data object for brand name, description, ratings, prices etc. See DataObject definition   |
| ext       | No            | This object is a placeholder that may contain custom JSON agreed to by the parties to support flexibility beyond the standard defined in this specification   |

### 3.2.23 Object : native.request.native.assets.title

| Attribute | Always Passed | Description   |
|-----------|---------------|---|
| len       | Yes           | Maximum length of the text in the title element. Recommended to   |
| ext       | n/a           | This object is a placeholder that may contain custom JSON agreed to by the parties to support flexibility beyond the standard defined in this specification |

### 3.2.24 Object : native.request.native.assets.image

| Attribute | Always Passed | Description   |
|-----------|---------------|---|
| type      | Yes           | Type ID of the image element supported by the publisher. The publisher can display this information in an appropriate format. See Table Image Asset Types.  |
| w         | No            | Width of the image in pixels.   |
| wmin      | No            | The minimum requested width of the image in pixels. This option should be used for any rescaling of images by the client. Either w or wmin should be transmitted. If only w is included, it should be considered an exact requirement.  |
| h         | No            | Height of the image in pixels.  |
| hmin      | No            | The minimum requested height of the image in pixels. This option should be used for any rescaling of images by the client. Either h or hmin should be transmitted. If only h is included, it should be considered an exact requirement.   |
| mimes     | n/a           | Whitelist of content MIME types supported. Popular MIME types include, but are not limited to "image/jpg" "image/gif". Each implementing Exchange should have their own list of supported types in the integration docs. See Wikipedia's MIME page for more information and links to all IETF RFCs. If blank, assume all types are allowed. |
| ext       | n/a           | This object is a placeholder that may contain custom JSON agreed to by the parties to support flexibility beyond the standard defined in this specification   |

### 3.2.25 Object : native.request.native.assets.video

| Attribute | Always Passed | Description  |
|-----------|---------------|--|
| mimes     | Yes           | Content MIME types supported. Popular MIME types include, but are not limited to "video/x-mswmv" for Windows Media, and "video/x-flv" for Flash Video, or "video/mp4". Note that native frequently does not support flash. |

|             |     |  |
|-------------|-----|--|
| minduration | Yes | Minimum video ad duration in seconds.  |
| maxduration | Yes | Maximum video ad duration in seconds   |
| protocols   | Yes | An array of video protocols the publisher can accept in the bid response. See OpenRTB Table 'Video Bid Response Protocols' for a list of possible values               |
| ext         | n/a | <del>This object is a placeholder that may contain custom JSON agreed to by the parties to support flexibility beyond the standard defined in this specification</del> |

### 3.2.26 Object : native.request.native.assets.data

| Attribute | Always Passed | Description  |
|-----------|---------------|--|
| type      | Yes           | Type ID of the element supported by the publisher. The publisher can display this information in an appropriate format. See Data Asset Types table for commonly used examples. |
| len       | No            | Maximum length of the text in the element's response.  |
| ext       | n/a           | <del>This object is a placeholder that may contain custom JSON agreed to by the parties to support flexibility beyond the standard defined in this specification</del>         |

### 3.2.27 Object : native.request.native.eventtrackers

| Attribute | Always Passed | Description  |
|-----------|---------------|--|
| event     | Yes           | Type of event available for tracking.  |
| methods   | Yes           | Array of the types of tracking available for the given event.  |
| Ext       | n/a           | <del>This object is a placeholder that may contain custom JSON agreed to by the parties to support flexibility beyond the standard defined in this specification</del> |



## 4 Bid Response Details

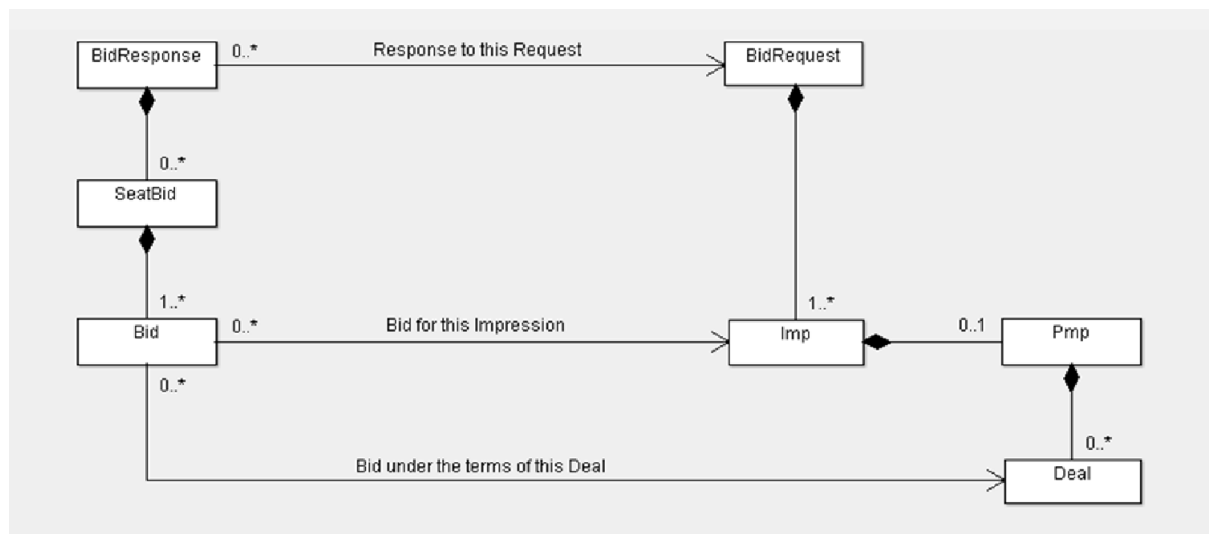
### 4.1 Object List and Model

Following is the object list for the bid response:

#### 4.1.1 Object List

| Object      | Section | Description   |
|-------------|---------|---|
| bidresponse | 4.2.1   | Top-level object.   |
| seatbid     | 4.2.2   | Collection of bids made by the bidder on behalf of a specific seat. |
| Bid         | 4.2.3   | An offer to buy a specific impression under certain business terms. |

#### 4.1.2 Object Model



### 4.2 Object Definitions

Following are definitions for the bid response objects.

#### 4.2.1 Object : bidresponse

The top-level bid response object is defined below. The “id” attribute is a reflection of the bid request ID for logging purposes. Similarly, “bidid” is an optional response tracking ID for bidders. If specified, it can be included in the subsequent win notice call if the bidder wins. At least one

“seatbid” object is required, which contains a bid on at least one impression. Other attributes are optional since an exchange may establish default values.

No-Bids on all impressions should be indicated as a HTTP 204 response. For no-bids on specific impressions, the bidder should omit these from the bid response.

| Attribute         | Type;Requirement | Description  |
|-------------------|------------------|--|
| <i>id</i>         | String;required  | ID of the bid request to which this is a response  |
| <i>seatbid</i>    | Object;required  | Array of seatbid objects; 1+ required if a bid is to be made.  |
| <i>bidid</i>      | String;          | Bidder generated response ID to assist with logging/tracking.  |
| <i>cur</i>        | String;required  | USD only, default:“USD”  |
| <i>customdata</i> | Optional         | Optional feature to allow a bidder to set data in the exchange’s cookie. The string must be in base85 cookie safe characters and be in any format. Proper JSON encoding must be used to include “escaped” quotation marks. |
| <i>nbr</i>        | Integer          | Reason for not bidding. Refer to List 5.22.  |
| <i>ext</i>        | object           | Placeholder for bidder-specific extensions to OpenRTB.   |

#### 4.2.2 Object : seatbid

| Attribute    | Type;Requirement          | Description  |
|--------------|---------------------------|--|
| <i>Bid</i>   | Object array;<br>Required | Array of 1+ <i>Bid</i> objects (Section 4.2.3) each related to an impression. Multiple bids can relate to the same impression. |
| <i>seat</i>  | String                    | ID of the buyer seat (e.g., advertiser, agency) on whose behalf this bid is made.  |
| <i>group</i> | Integer;default 0         | 0 = impressions can be won individually; 1 = impressions must be won or lost as a group.                                       |
| <i>ext</i>   | Object                    | Placeholder for bidder-specific extensions to OpenRTB.   |

#### 4.2.3 Object:bid

| Attribute    | Type;Requirement | Description   |
|--------------|------------------|---|
| <i>id</i>    | String;Required  | ID for the bid object chosen by the bidder for tracking and debugging purposes.   |
| <i>impid</i> | String;Required  | ID of the <i>Imp</i> object in the related bid request.   |
| <i>price</i> | float;Required   | Bid price expressed as CPM although the actual transaction is for a unit impression only. Note that while the type indicates float, integer math is highly recommended when handling currencies (e.g., BigDecimal in Java). |

|                |                 |  |
|----------------|-----------------|--|
| adid           | String;Required | ID of a preloaded ad to be served if the bid wins.   |
| nurl           | String          | Win notice URL called by the exchange if the bid wins (not necessarily indicative of a delivered, viewed, or billable ad); optional means of serving ad markup   |
| adm            | String          | Optional means of conveying ad markup in case the bid wins; supersedes the win notice if markup is included in both.   |
| adomain        | String array    | Advertiser domain for block list checking (e.g., "ford.com"). This can be an array of for the case of rotating creatives. Exchanges can mandate that only one domain is allowed.                                     |
| bundle         | String          | A platform-specific application identifier intended to be unique to the app and independent of the exchange. On Android, this should be a bundle or package name (e.g., com.foo.mygame). On iOS, it is a numeric ID. |
| iurl           | String          | URL without cache-busting to an image that is representative of the content of the campaign for ad quality/safety checking.  |
| cid            | String          | Campaign ID to assist with ad quality checking; the collection of creatives for which iurl should be representative.   |
| crid           | String          | Creative ID to assist with ad quality checking.  |
| cat            | String array    | IAB content categories of the creative. Refer to List 5.1.   |
| attr           | Integer array   | Set of attributes describing the creative. Refer to List 5.3.  |
| api            | Integer         | API required by the markup if applicable. Refer to List 5.6.   |
| protocol       | Integer         | Video response protocol of the markup if applicable. Refer to List 5.8.  |
| qagmediatating | Integer         | <del>Creative media rating per IQG guidelines. Refer to List 5.17.</del>   |
| dealid         | String          | Reference to the deal.id from the bid request if this bid pertains to a private marketplace direct deal.   |
| w              | Integer         | Width of the creative in device independent pixels (DIPS).   |
| h              | Integer         | Height of the creative in device independent pixels (DIPS).  |
| exp            | Integer         | Advisory as to the number of seconds the bidder is willing to wait between the auction and the actual impression.  |
| ext            | Object          | <del>Placeholder for bidder-specific extensions to OpenRTB</del>   |

#### 4.2.4 Object: native.response

| Field         | Type             | Description   |
|---------------|------------------|---|
| ver           | string           | Version of the Native Markup version in use.  |
| assets        | array of objects | List of native ad's assets.   |
| link          | object           | Destination Link. This is default link object for the ad. Individual assets can also have a link object which applies if the asset is activated(clicked). If the asset doesn't have a link object, the parent link object applies. See LinkObject Definition                  |
| eventtrackers | array of objects | Array of tracking objects to run with the ad, in response to the declared supported methods in the request.   |
| privacy       | string           | If support was indicated in the request, URL of a page informing the user about the buyer's targeting activity.   |
| assetsurl     | string           | URL of an alternate source for the assets object. The expected response is a JSON object mirroring the assets object in the bid response, subject to certain requirements as specified in the individual objects. Where present, overrides the asset object in the response.. |
| ext           | object           | This object is a placeholder that may contain custom JSON agreed to by the parties to support flexibility beyond the standard defined in this specification   |

#### 4.2.5 Object: native.assets

| Field            | Type   | Description   |
|------------------|--------|---|
| id               | int    | Unique asset ID, assigned by exchange, must match one of the asset IDs in request.  |
| required         | int    | Set to 1 if asset is required. (bidder requires it to be displayed).  |
| title            | object | Title object for title assets. See TitleObject definition.  |
| img              | object | Image object for image assets. See ImageObject definition.  |
| video            | object | Video object for video assets. See Video response object definition. Note that in-stream video ads are not part of Native. Native ads may contain a video as the ad creative itself.            |
| data             | object | Data object for ratings, prices etc.  |
| link             | object | Link object for call to actions. The link object applies if the asset item is activated (clicked). If there is no link object on the asset, the parent link object on the bid response applies. |
| ext <sup>1</sup> | object | This object is a placeholder that may contain custom JSON agreed to by the parties to support flexibility beyond the standard defined in this specification                                     |

#### 4.2.5.1 Title Object

| Field | Type   | Description  |
|-------|--------|--|
| text  | String | The text associated with the text element.   |
| ext   | object | This object is a placeholder that may contain custom JSON agreed to by the parties to support flexibility beyond the |

#### 4.2.5.2 Image Object

| Field | Type    | Description   |
|-------|---------|---|
| url   | string  | URL of the image asset.   |
| w     | integer | Width of the image in pixels.   |
| h     | integer | Height of the image in pixels.  |
| ext   | object  | This object is a placeholder that may contain custom JSON agreed to by the parties to support flexibility beyond the standard defined in this specification |

#### 4.2.5.3 Data Object

| Field | Type   | Description   |
|-------|--------|---|
| label | string | The optional formatted string name of the data type to be displayed.  |
| value | string | The formatted string of data to be displayed. Can contain a formatted value such as “5 stars” or “\$10” or “3.4 stars out of 5”.                            |
| ext   | object | This object is a placeholder that may contain custom JSON agreed to by the parties to support flexibility beyond the standard defined in this specification |

#### 4.2.5.4 Video Object

| Field   | Type   | Description |
|---------|--------|-------------|
| Vasttag | string | vast xml.   |

#### 4.2.6 Object : native.response.link

| Field         | Type             | Description   |
|---------------|------------------|---|
| url           | string           | Landing URL of the clickable link.  |
| clicktrackers | array of strings | List of third-party tracker URLs to be fired on click of the URL  |
| fallback      | string (URL)     | Fallback URL for deeplink. To be used if the URL given in url is not supported by the device.   |
| ext           | object           | This object is a placeholder that may contain custom JSON agreed to by the parties to support flexibility beyond the standard defined in this specification |

#### 4.2.7 Object : native.response.eventtrackers

| Field      | Type              | Description   |
|------------|-------------------|---|
| event      | integer           | Type of event to track  |
| method     | integer           | Type of tracking requested.   |
| url        | string            | The URL of the image or js. Required for image or js, optional for custom.  |
| customdata | object(key,value) | To be agreed individually with the exchange, an array of key:value objects for custom tracking  |
| ext        | object            | This object is a placeholder that may contain custom JSON agreed to by the parties to support flexibility beyond the standard defined in this specification |

#### 4.2.8 Object : native.response.ext

| Field      | Type   | Description  |
|------------|--------|--|
| privacyimg | string | If support was indicated in the request, image icon URL that informing to move a opt-out page. |

### 4.3 Substitution Macros

| Macro                            | Description   |
|----------------------------------|---|
| <code>\${AUCTION_ID}</code>      | ID of the bid request; from <code>BidRequest.id</code> attribute.                     |
| <code>\${AUCTION_BID_ID}</code>  | ID of the bid; from <code>BidResponse.bidid</code> attribute.                         |
| <code>\${AUCTION_IMP_ID}</code>  | ID of the impression just won; from <code>imp.id</code> attribute.                    |
| <code>\${AUCTION_SEAT_ID}</code> | ID of the bidder seat for whom the bid was made.                                      |
| <code>\${AUCTION_AD_ID}</code>   | ID of the ad markup the bidder wishes to serve; from <code>bid.adid</code> attribute. |
| <code>\${AUCTION_PRICE}</code>   | Settlement price using the same currency and units as the bid.                        |

|   |  |
|---|--|
| <code>\${AUCTION_CURRENCY}</code>                 | The currency used in the bid (explicit or implied); for confirmation only. |
| <code>\${CLICK_TRACKING_URL}</code>               | Click tracking url   |
| <code>\${CLICK_TRACKING_URL_ENCODE}</code>        | Encoded click tracking url   |
| <code>\${CLICK_TRACKING_URL_ENCODE_ENCODE}</code> | Double-Encoded click tracking url  |
| <code>\${US_PRIVACY}</code>                       | Fill with the CCPA signal  |

All macros must be formatted as `${MACRO_NAME}`  
Macro substitution is supported for the following fields:

- `seatbid.bid.nurl`
- `seatbid.bid.adm`
- ~~`seatbid.bid.ext.nurls`~~
- ~~`seatbid.bid.ext.imptrackers`~~
- ~~`seatbid.bid.ext.admnative.native.imptrackers`~~

We only support Base 64 encoding. If the bidder requires price to be encoded, they should use the below `${AUCTION_PRICE:B64}`

## 5 Reference Lists/Enumerations

Please refer to the tables in the [OpenRTB 2.4](#) specification and [Native subspec](#).

## 6 Bid Request/Response Samples

### 6.1 Bid Requests

Following is a basic example of a bid request. Some optional parameters are included in this example

#### 6.1.1 Example 1 – Banner Ad (WebSite)

```
{
  "id": "1234534625254",
  "at": 2,
  "tmax": 120,
  "imp": [
    {
      "id": "1",
      "banner": {
        "w": 300,
        "h": 250,
        "pos": 1,
        "battnr": [
          1,
          2
        ]
      }
    }
  ]
}
```

```

    }
  },
  ],
  "site":{
    "id":"234563",
    "name":"Site ABCD",
    "domain":"www.siteabcd.com",
    "cat":[
      "IAB2-1",
      "IAB2-2"
    ],
    "page":"http://www.siteabcd.com/page.htm",
    "ref":"http://referringsite.com/referringpage.htm",
    "publisher":{
      "id":"123",
      "name":"Pub ABCD"
    }
  },
  "regs":{
    "coppa":0
  },
  "device":{
    "ip":"64.124.253.1",
    "ua":"Mozilla/5.0 (Macintosh; U; Intel Mac OS X 10.6; en-US; rv:1.9.2.16) Gecko/20110319 Firefox/3.6.16",
    "os":"OS X"
  },
  "user":{
    "id":"45asdf987656789adfad4678rew656789",
    "buyeruid":"5df678asd8987656asdf78987654"
  }
}

```

### 6.1.2 Example 2 – Banner Ad (App)

```

{
  "id":"8e41bc64-188d-43cf-b98f-9853cb2a2886",
  "at":2,
  "tmax":120,
  "imp":[
    {
      "banner":{
        "api":[
          3,
          5
        ],
        "battr":[
          3,
          8,
          9,
          10,
          14,
          6

```



```

        ],
        "btype": [
            4
        ],
        "h": 50,
        "pos": 1,
        "w": 320
    },
    "bidfloor": 0.12,
    "displaymanager": "suez",
    "displaymanagerver": "1.10.0",
    "id": "1",
    "instl": 0,
    "secure": 0,
    "tagid": "b12ae796186931bfe7aa39471487b980"
}
],
"app": {
    "bundle": "553834731",
    "cat": [
        "IAB3"
    ],
    "id": "a422f9bf94df0c59389d5beff67f8821",
    "name": "App_Name",
    "publisher": {
        "id": "04241e0b1cc98976858ce16377c7eef4",
        "name": "Publisher_Name"
    },
    "storeurl": "https://itunes.apple.com/us/app/candy-crush-saga/id553834731?mt=8"
},
"bcats": [
    "IAB7-39",
    "IAB8-5",
    "IAB8-18",
    "IAB9-9",
    "IAB25",
    "IAB26",
    "IAB3-7"
],
"device": {
    "carrier": "310-260",
    "connectiontype": 2,
    "devicetype": 4,
    "dnt": 0,
    "geo": {
        "country": "USA",
        "lat": 10.738701,
        "lon": -76.0037
    },
    "h": 1920,
    "hwv": "iPhone 6+",
    "ifa": "e785aa3f-0b58-4ff1-8758-74ae56a9b2d9",
    "ip": "8.25.196.26",
    "js": 1,
    "language": "en",
    "make": "Apple",
    "model": "iPhone",

```

```

    "os": "iOS",
    "osv": "8.1",
    "ua": "Mozilla/5.0 (iPhone; CPU iPhone OS 8_1 like Mac OS X) AppleWebKit/600.1.4 (KHTML, like Gecko) Mobile/12B411",
    "w": 1080
  }
}

```

### 6.1.3 Example 4 – Private Marketplace

```

{
  "id": "8e41bc64-188d-43cf-b98f-9853cb2a2886",
  "at": 2,
  "tmax": 120,
  "imp": [
    {
      "banner": {
        "api": [
          3,
          5
        ],
        "battr": [
          3,
          8,
          9,
          10,
          14,
          6
        ],
        "btype": [
          4
        ],
        "h": 50,
        "pos": 1,
        "w": 320
      },
      "bidfloor": 3.0,
      "id": "1",
      "instl": 0,
      "pmp": {
        "deals": [
          {
            "at": 2,
            "bidfloor": 5.0,
            "id": "09e57922e9684f508b30cb897ff6e3ab",
            "wadomain": [
              "nike.com"
            ]
          }
        ],
        "private_auction": 1
      },
      "secure": 0
    }
  ],
  "app": {
    "bundle": "553834731",

```

```

    "cat":[
      "IAB3"
    ],
    "id":"a422f9bf94df0c59389d5beff67f8821",
    "name":"App_Name",
    "publisher":{
      "id":"04241e0b1cc98976858ce16377c7eef4",
      "name":"Publisher_Name"
    },
    "storeurl":"https://itunes.apple.com/us/app/candy-crush-
saga/id553834731?mt=8",
    "ver":"1.0"
  },
  "device":{
    "carrier":"310-260",
    "connectiontype":2,
    "devicetype":4,
    "dnt":0,
    "geo":{
      "country":"USA"
    },
    "hww":"iPhone 6+",
    "ifa":"3485E719-C68E-495B-945E-C8DF42879D3D",
    "ip":"8.25.196.26",
    "js":1,
    "language":"en",
    "make":"Apple",
    "model":"iPhone",
    "os":"iOS",
    "osv":"8.1",
    "ua":"Mozilla/5.0 (iPhone; CPU iPhone OS 8_1 like Mac OS X) AppleWebKit/6
00.1.4 (KHTML, like Gecko) Mobile/12B411"
  }
}

```

#### 6.1.4 Example 3 – Video Ad

```

{
  "id":"8e41bc64-188d-43cf-b98f-9853cb2a2886",
  "at":2,
  "tmax":120,
  "imp":[
    {
      "bidfloor":0.12,
      "id":"1",
      "instl":1,
      "secure":0,
      "video":{
        "api":[
          3,
          5
        ],
        "battr":[
          3,
          8,
          9,
          10,

```

```

        14
      ],
      "h":480,
      "linearity":1,
      "maxduration":15,
      "mimes":[
        "video/mp4"
      ],
      "minduration":15,
      "protocols":[
        2,
        5,
        3,
        6
      ],
      "skip":0,
      "w":320
    }
  }
],
"app":{
  "bundle":"553834731",
  "cat":[
    "IAB3",
    "business"
  ],
  "id":"a422f9bf94df0c59389d5beff67f8821",
  "name":"App_Name",
  "publisher":{
    "id":"04241e0b1cc98976858ce16377c7eef4",
    "name":"Publisher_Name"
  },
  "storeurl":"https://itunes.apple.com/us/app/candy-crush-
saga/id553834731?mt=8",
  "ver":"1.0"
},
"device":{
  "carrier":"310-260",
  "connectiontype":2,
  "devicetype":4,
  "dnt":0,
  "geo":{
    "country":"USA",
    "lat":30.738701,
    "lon":-24.0037
  },
  "h":1920,
  "hvv":"iPhone 6+",
  "ifa":"e785aa3f-0b58-4ff1-8758-74ae56a9b2d9",
  "ip":"8.25.196.26",
  "js":1,
  "language":"en",
  "make":"Apple",
  "model":"iPhone",
  "os":"iOS",
  "osv":"8.1",
  "ua":"Mozilla/5.0 (iPhone; CPU iPhone OS 8_1 like Mac OS X) AppleWebKit/6
00.1.4 (KHTML, like Gecko) Mobile/12B411",

```

```

    "w":1080
  }
}

```

### 6.1.5 Example 5 – Native Ad

```

{
  "id":"8e41bc64-188d-43cf-b98f-9853cb2a2886",
  "at":2,
  "tmax":120,
  "imp":[
    {
      "bidfloor":0.12,
      "id":"1",
      "instl":0,
      "native":{
        "battr":[
          3,
          8,
          9,
          10,
          14,
          6
        ],
        "ver":"1.1",
        "request":{"native":{"assets":[{"data":{"len":15,"type":12},"id":5,"required":0},{"id":3,"img":{"hmin":80,"type":1,"wmin":80},"required":1},{"id":2,"img":{"h":627,"type":3,"w":1200},"required":1},{"data":{"len":100,"type":2},"id":4,"required":1},{"id":1,"required":1,"title":{"len":25}}],"ver":"1.2}}"},
        "secure":1
      }
    ],
    "app":{
      "bundle":"553834731",
      "cat":[
        "IAB1",
        "IAB1-6"
      ],
      "id":"a422f9bf94df0c59389d5beff67f8821",
      "name":"App_Name",
      "publisher":{
        "id":"04241e0b1cc98976858ce16377c7eef4",
        "name":"Publisher_Name"
      },
      "storeurl":"https://itunes.apple.com/us/app/candy-crush-saga/id553834731?mt=8",
      "ver":"1.0"
    },
    "device":{
      "carrier":"310-260",
      "connectiontype":2,
      "devicetype":4,
      "dnt":0,
      "geo":{
        "city":"Chicago",
        "country":"USA",
        "metro":"602",
        "region":"IL",

```

```

        "zip": "60614"
    },
    "hwv": "iPhone 6+",
    "ifa": "3485E719-C68E-495B-945E-C89D3DF4287D",
    "ip": "108.176.57.230",
    "js": 1,
    "language": "en",
    "make": "Apple",
    "model": "iPhone",
    "os": "iOS",
    "osv": "8.1",
    "ua": "Mozilla/5.0 (iPhone; CPU iPhone OS 8_1 like Mac OS X) AppleWebKit/600.1.4 (KHTML, like Gecko) Mobile/12B411"
}
}

```

### 6.1.6 Example 6 – Native Video

```

{
    "id": "8e41bc64-188d-43cf-b98f-9853cb2a2886",
    "at": 2,
    "tmax": 120,
    "imp": [
        {
            "bidfloor": 0.12,
            "id": "1",
            "instl": 0,
            "native": {
                "battr": [
                    3,
                    8,
                    9,
                    10,
                    14,
                    6
                ],
                "request": "{\\\"native\\\":{\\\"assets\\\":[{\\\"data\\\":{\\\"len\\\":15,\\\"type\\\":12},\\\"id\\\":5,\\\"required\\\":0},{\\\"id\\\":3,\\\"img\\\":{\\\"hmin\\\":80,\\\"type\\\":1,\\\"wmin\\\":80},\\\"required\\\":1},{\\\"id\\\":2,\\\"img\\\":{\\\"h\\\":627,\\\"type\\\":3,\\\"w\\\":1200},\\\"required\\\":1},{\\\"data\\\":{\\\"len\\\":100,\\\"type\\\":2},\\\"id\\\":4,\\\"required\\\":1},{\\\"id\\\":1,\\\"required\\\":1,\\\"title\\\":{\\\"len\\\":25}},{\\\"id\\\":7,\\\"required\\\":0,\\\"video\\\":{\\\"maxduration\\\":120,\\\"mimes\\\":[\\\"video/mp4\\\"],\\\"minduration\\\":5,\\\"protocols\\\":[2,3,5,6]}}],\\\"ver\\\":1.1}}",
            },
            "secure": 1
        }
    ],
    "app": {
        "bundle": "553834731",
        "cat": [
            "IAB1",
            "IAB1-6"
        ],
        "id": "a422f9bf94df0c59389d5beff67f8821",
        "name": "App_Name",
        "publisher": {
            "id": "04241e0b1cc98976858ce16377c7eef4",
            "name": "Publisher_Name"
        }
    }
}

```

```

    },
    "storeurl": "https://itunes.apple.com/us/app/candy-crush-
saga/id553834731?mt=8",
    "ver": "1.0"
  },
  "device": {
    "carrier": "310-260",
    "connectiontype": 2,
    "devicetype": 4,
    "dnt": 0,
    "geo": {
      "city": "Chicago",
      "country": "USA",
      "metro": "602",
      "region": "IL",
      "zip": "60614"
    },
    "hww": "iPhone 6+",
    "ifa": "3485E719-C68E-495B-945E-C89D3DF4287D",
    "ip": "108.176.57.230",
    "js": 1,
    "language": "en",
    "make": "Apple",
    "model": "iPhone",
    "os": "iOS",
    "osv": "8.1",
    "ua": "Mozilla/5.0 (iPhone; CPU iPhone OS 8_1 like Mac OS X) AppleWebKit/6
00.1.4 (KHTML, like Gecko) Mobile/12B411"
  }
}

```

## 6.2 Bid Responses

### 6.2.1 Example 1 – Banner Ad

```

{
  "id": "1234567890",
  "seatbid": [
    {
      "bid": [
        {
          "id": "1",
          "impid": "102",
          "price": 9.43,
          "adid": "314",
          "cid": "42",
          "cat": [
            "IAB12"
          ],
          "adm": "<a href='\"http://adserver.com/click?adid=12345&tracker=${
CLICK_TRACKING_URL_ENCODE}\"><img src='\"http://image1.cdn.com/impid=102\"/></a>"

```

```

",
    "nurl": "http://adserver.com/winnotice?impid=102&winprice=${AUCTION_PRICE}",
    "iurl": "http://adserver.com/preview?crid=314",
    "adomain": [
        "advertiserdomain.com"
    ]
},
    "seat": "4"
}
]
}

```

### 6.2.2 Example 2 – Private Marketplace

```

{
    "id": "1234567892",
    "cur": "USD",
    "seatbid": [
        {
            "bid": [
                {
                    "id": "1114125-afaff2f-af2251",
                    "impid": "1",
                    "price": 9.43,
                    "adid": "314",
                    "dealid": "deal-1",
                    "adm": "<a href=\"http://adserver.com/click?adid=12345&tracker==${CLICK_TRACKING_URL_ENCODE}\"> <img src=\"http://image1.cdn.com/impid=102\"/></a>",
                    "nurl": "http://adserver.com/winnotice?impid=102&winprice=${AUCTION_PRICE}",
                    "adomain": [
                        "advertiserdomain.com"
                    ]
                }
            ],
            "seat": "58"
        }
    ]
}

```

### 6.2.3 Example 3 – Video Ad

```

{
    "id": "1234567890",
    "seatbid": [
        {
            "bid": [
                {
                    "id": "1",
                    "impid": "102",
                    "price": 9.43,
                    "adid": "314",
                    "cid": "42",
                    "cat": [
                        "IAB12"
                    ]
                }
            ]
        }
    ]
}

```



```

    ],
    "adm": "<VAST version=\"2.0\"></VAST>",
    "nurl": "http://adserver.com/winnotice?impid=102&winprice=${AUCTI
ON_PRICE}",
    "adomain": [
        "advertiserdomain.com"
    ]
  },
  ],
  "seat": "4"
}
]
}

```

#### 6.2.4 Example 4 – Native Ad

```

{
  "bidid": "abc1234",
  "cur": "USD",
  "id": "1234567890",
  "seatbid": [
    {
      "seat": "xyz12345",
      "bid": [
        {
          "id": "12345678",
          "adid": "314",
          "cat": [
            "IAB3"
          ],
          "adm": "{ \"native\": { \"link\": { \"url\": \"http://www.adserver.co
m\" }, \"assets\": [ { \"id\": 1, \"title\": { \"text\": \"This is the title\" }, { \"id\":
2, \"img\": { \"url\": \"http://
image1.cdn.com/creatives/8003cbe865a24282a47ce346ff271000\", \"h\": 627, \"w\": 1
200 } }, { \"id\": 3, \"img\": { \"url\": \"http://
image1.cdn.com/creatives/a7b528d5c537426da5e42f418cc35e47\", \"h\": 80, \"w\": 80
} }, { \"data\": { \"value\": \"This is the text\" }, \"id\": 4 }, { \"data\": { \"value\": \"
CTA Text\" }, \"id\": 5 }, { \"data\": { \"value\": \"4.0\" }, \"id\": 6 } } }",
          "adomain": [
            "advertiserdomain.com"
          ],
          "bundle": "com.publisher.app",
          "iurl": "http://img.cdn.com/sampleimage.jpg",
          "cid": "campaign111",
          "crid": "1",
          "impid": "1",
          "price": 0.999
        }
      ]
    }
  ]
}

```

#### 6.2.5 Example 5 – Native Video Ad

```

{
  "bidid": "abc1234",
  "cur": "USD",
  "id": "1234567890",
  "seatbid": [
    {
      "seat": "xyz12345",
      "bid": [
        {
          "id": "12345678",
          "adid": "314",
          "cat": [
            "IAB1-6"
          ],
          "adm": "{\r\n  \"native\":{\r\n    \"link\":{\r\n      \"url\": \"http://www.adserver.com/\",\r\n      \"imptrackers\": [\r\n        \"http://imptrackers1.com/win/{AUCTION_ID}/{AUCTION_PRICE}/0.999\", \r\n        \"http://imptrackers2.com/win/{AUCTION_ID}/{AUCTION_PRICE}/0.999\",\r\n      ], \r\n      \"assets\": [\r\n        {\r\n          \"id\": 1, \r\n          \"title\": {\r\n            \"text\": \"Title\"\r\n          }, \r\n          {\r\n            \"id\": 2, \r\n            \"img\": {\r\n              \"url\": \"http://cdn.com/creatives/8003cbe865a24282a47ce346ff271000\", \r\n              \"h\": 627, \r\n              \"w\": 1200\r\n            }, \r\n            {\r\n              \"id\": 3, \r\n              \"img\": {\r\n                \"url\": \"http://cdn.com/creatives/a7b528d5c537426da5e42f418cc35e47\", \r\n                \"h\": 80, \r\n                \"w\": 80\r\n              }, \r\n              {\r\n                \"id\": 4, \r\n                \"data\": {\r\n                  \"value\": \"This is the text\"\r\n                }, \r\n                {\r\n                  \"id\": 5, \r\n                  \"data\": {\r\n                    \"value\": \"CTA Text\"\r\n                  }, \r\n                  {\r\n                    \"id\": 6, \r\n                    \"data\": {\r\n                      \"value\": \"4.0\"\r\n                    }, \r\n                    {\r\n                      \"id\": 7, \r\n                      \"video\": {\r\n                        \"vasttag\": \"<<INSERT VAST XML>>\"\r\n                      }, \r\n                      {\r\n                        \"adomain\": [
                          \"advertiserdomain.com\"
                        ],
                          \"bundle\": \"com.publisher.app \",
                          \"cid\": \"campaign\",
                          \"crid\": \"1\",
                          \"impid\": \"1\",
                          \"iurl\": \"http://img.cdn.com/sampleimage.jpg\",
                          \"price\": 0.999
                        }
                      }
                    }
                  ]
                }
              }
            }
          ]
        }
      ]
    }
  ]
}

```

## 7 Implementaion Notes

### 7.1 No bid Signaling

Many exchanges support multiple response types as a no-bid:

- HTTP 204 “No Content” from the bidder (*most economical in terms of bandwidth*).
- A well-formed no bid response with a reason code: {"id": "1234567890", "nbr": 2}

### 7.2 Impression Expiration

Please refer to the tables in the [OpenRTB 2.4](#) specification. Section 7.2

### 7.3 PMP & Direct Deals

Please refer to the tables in the [OpenRTB 2.4](#) specification. Section 7.3

### 7.4 Skippability

Please refer to the tables in the [OpenRTB 2.4](#) specification. Section 7.4

### 7.5 COPPA Regulation Flag

Please refer to the tables in the [OpenRTB 2.4](#) specification. Section 7.5

### 7.6 User Synchronization

The partner will be able to pass their unique user id to TPMN via the following URL:

[http://ad.tpmn.co.kr/pixelCt.tpmn?tpmn\\_nid={ad\\_network\\_id}&tpmn\\_buid={user\\_token}&tpmn\\_expires={days}](http://ad.tpmn.co.kr/pixelCt.tpmn?tpmn_nid={ad_network_id}&tpmn_buid={user_token}&tpmn_expires={days})

- {ad\_network\_id} is an identifier specific to your RTB and your company, it will be set by TPMN.
- {user\_token} is an ASCII alpha-numeric value passed into the call by the partner. It will be set by you for each unique user. however it should not exceed 32 characters
- {days} is the number of days before the cookie is expired by the browser. If no value is specified, the default is 30 days.

| Name      | Scope    | Note   |
|-----------|----------|--|
| tpmn_nid  | required | Code for the Pixel will be provided by TPMN to the Demand Partner  |
| tpmn_buid | optional | Any per user cookie that Demand Partner wishes to set via TPMN; This information will be passed to the Demand Partner if present in the call via the “user.buyeruid” parameter in the bidding call |
| days      | optional |  |

TPMN will also be able to initiate user synchronization. The partner will issue TPMN a URL that will redirect to the pixel URL (above), properly populated with {ad\_network\_id}, {user\_token} and {days}. Note that this URL should be for a pixel that performs a 302 redirect, rather than for an iframe with a script, etc. within it. The only redirect from the partner's URL should be to the TPMN pixel. TPMN will traffic the partner's URL on publishers that have opted to participate in the TPMN initiated user sync program. In the event that the partner does not recognize the user a transparent 1x1 pixel (or 204 no content) should be rendered by the partner and no redirect should be done.

TPMN will associate {user\_token} with the user's browser and make it available in any later bid requests from this user's browser. This will be sent in the user.buyeruid field of the JSON bid request.

## 7.7 Second Price Auction

In a second price auction of the type TPMN runs for its RTB Demand Partners, the winner pays the second highest bid price when it wins the auction.

This is the default pricing method that TPMN uses for its RTB Service.

The second price is communicated to the winning Demand Partner during the creative call by replacing a PRICE MACRO supplied in the win notice URL or creative URL

## 7.8 Click Tracking

For accurate click tracking, the Demand Partner needs to provide a click tracking MACRO to be placed by name in the HTML(adm), which would be replaced with the TPMN click tracker

### 7.8.1 \${CLICK\_TRACKING\_URL}

The unescaped click URL for the ad. In the snippet, an escaped version of the third party click URL should directly follow the macro.

For example, if the third-party click URL is <http://your.adserver.com/click?click=clk>, then the following code could be used with the single-escaped version of the third party click URL following the macro invocation:

```
<a href="${CLICK_TRACKING_URL}http%3A%2F%2Fyour.adserver.com%2Fclick%3Fclick%3Dclk"></a>
```

At ad serving time, this is expanded to:

```
<a href="http://tpmn.clickurl?...&rd_url=http%3A%2F%2Fyour.adserver.com%2Fclick%3Fclick%3Dclk"></a>
```

The URL will first register the click with TPMN, and then redirect to the third party click URL.

### 7.8.2 \${CLICK\_TRACKING\_URL\_ENCODE}

The escaped click URL for the ad. Use this instead of CLICK\_TRACKING\_URL if you need to first pass the value through another server that will then return a redirect.

For example, the following code could be used in an HTML snippet:

```
<a href="http://your.adserver.com/click?tpmn_click_url=${CLICK_TRACKING_URL_ENCODE}"></a>
```

At ad serving time, this is expanded to:

```
<a href="http://your.adserver.com/click?tpmn_click_url=http:%3A%2F%2Ftpmn.clickurl%3F...%26rd_url%3D"></a>
```

This will register the click with your.adserver.com which will then be responsible for redirecting to the URL passed in the tpmn\_click\_url parameter. This assumes that your.adserver.com unescapes the tpmn\_click\_url parameter.

### 7.8.3 \${CLICK\_TRACKING\_URL\_ENCODE\_ENCODE}

The double-escaped click URL for the ad. Use this instead of CLICK\_TRACKING\_URL if you need to first pass the value through another server that will then return a redirect.

For example, the following code could be used in an HTML snippet:

```
<a href="http://your.adserver.com/click?tpmn_click_url=${CLICK_TRACKING_URL_ENCODE_ENCODE}"></a>
```

At ad serving time, this is expanded to:

```
<a href="http://your.adserver.com/click?tpmn_click_url=http:%3A%2F%2Ftpmn.clickurl%3F...%26rd_url%3D"></a>
```

This will register the click with your.adserver.com which will then be responsible for redirecting to the URL passed in the tpmn\_click\_url parameter. This assumes that your.adserver.com unescapes the tpmn\_click\_url parameter.

## 7.9 Reporting

Please provide a single report (broken down by TPMN Site ID) for the previous day's numbers each day by noon. Reports should include the following in UTC :

- Bid requests received
- Impressions won
- Revenue(USD)
- TPMN Site(App) ID

Please include a row showing the total values for Impressions won and Revenue in the report.