TPMN RTB Spec - v2.5.0

1. Introduction

1.1 TPMN Open RTB Specifics

OpenRTB Specifics

TPMN presently supports following OpenRTB versions :

- OpenRTB : v2.5
- OpenRTB NativeAd : v1.2
- VAST 2.0, 3.0, 4.0 (both VAST Wrapper)

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 Version History

Version History

Version	Date	Changes
1.0.0	@August 12, 2014	RTB Core API
1.0.1	@July 2, 2015	Added support for Second Price Auction Added App Object Added Regulations Object Added sections “Implementation Notes” Updated for MACRO Updated Impression Object Updated sections “Reference Lists/Enumerations” Deprecated bid response field : nurl
1.0.2	@July 14, 2015	Updated Device Object
1.0.3	@July 27, 2015	Updated Bug fix
1.0.4	@May 18, 2016	Added Publisher Object
2.0.0	@October 27, 2016	Release of OpenRTB 2.4
2.0.1	@February 20, 2017	Updated Bug fix
2.0.2	@July 31, 2017	Updated NativeAd Object
2.0.3	@August 1, 2017	Updated Native Object(ver)
2.0.4	@October 1, 2018	Updated Bug fix
2.0.5	@July 29, 2019	Updated for Gdpr. Mandatory modification: tagid
2.0.6	@February 26, 2020	Updated for NativeAd Object(Ver)
2.0.7	@April 6, 2020	Updated for CCPA
2.0.8	@February 1, 2021	Updated for VideoAd
2.5.0	@June 30, 2021	Release of OpenRTB 2.5, Support Audio Ad, Support CTV/OTT, Support burl

1.3 TPMN RTB API

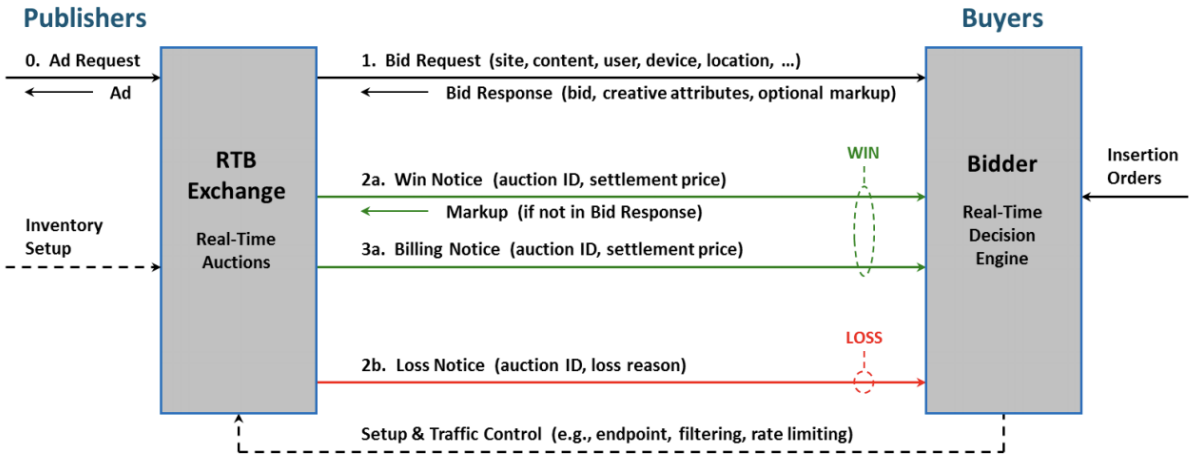
TPMN`s RTB API enables ad networks, demand side platforms, and other inventory buyers (collectively “Demand Partners”) to bid dynamically for each advertising impression, as it is served to users in real time. The process by which these advertising impressions are delivered through RTB works as follows:

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 Specification

Object List

Object	Section	Description
BidRequest	3.1	Top-level object.
Source	3.2	Request source details on post-auction decisioning (e.g., header bidding).
Regs	3.3	Regulatory conditions in effect for all impressions in this bid request.
Imp	3.4	Container for the description of a specific impression; at least 1 per request.
Metric	3.5	A quantifiable often historical data point about an impression.
Banner	3.6	Details for a banner impression (incl. in-banner video) or video companion ad.
Video	3.7	Details for a video impression.
Audio	3.8	Container for an audio impression.
Native	3.9	Container for a native impression conforming to the Dynamic Native Ads API.
Format	3.10	An allowed size of a banner.
Pmp	3.11	Collection of private marketplace (PMP) deals applicable to this impression.
Deal	3.12	Deal terms pertaining to this impression between a seller and buyer.
Site	3.13	Details of the website calling for the impression.

Object	Section	Description
App	3.14	Details of the application calling for the impression.
Publisher	3.15	Entity that controls the content of and distributes the site or app.
Content	3.16	Details about the published content itself, within which the ad will be shown.
Producer	3.17	Producer of the content; not necessarily the publisher (e.g., syndication).
Device	3.18	Details of the device on which the content and impressions are displayed.
Geo	3.19	Location of the device or user's home base depending on the parent object.
User	3.20	Human user of the device; audience for advertising.
Data	3.21	Collection of additional user targeting data from a specific data source.
Segment	3.22	Specific data point about a user from a specific data source.

3.1 Object : BidRequest

The top-level bid request object contains a globally unique bid request or auction ID. This id attribute is required as is at least one impression object (Section 3.4). Other attributes in this top-level object establish rules and restrictions that apply to all impressions being offered.

There are also several subordinate objects that provide detailed data to potential buyers. Among these are the Site and App objects, which describe the type of published media in which the impression(s) appear. These objects are highly recommended, but only one applies to a given bid request depending on whether the media is browser-based web content or a non-browser application, respectively.

BidRequest

Value	Type	Level	Description
id	string	required	Unique ID of the bid request, provided by the exchange
imp	object array	required	Array of Imp objects (Section 3.4) representing the impressions offered. At least 1 Imp object is required.
site	object	required in some cases	Details via a Site object (Section 3.13) about the publisher's website. Only applicable and recommended for websites.
app	object	required in some cases	Details via an App object (Section 3.14) about the publisher's app (i.e., non-browser applications). Only applicable and recommended for apps.
device	object	recommended	Details via a Device object (Section 3.18) about the user's device to which the impression will be delivered.
user	object	recommended	Details via a User object (Section 3.20) about the human user of the device; the advertising audience.
test	integer		Indicator of test mode in which auctions are not billable, where 0 = live mode, 1 = test mode.
at	integer		Auction type, where 1 = First Price, 2 = Second Price Plus.
tmax	integer		Maximum time in milliseconds the exchange allows for bids to be received including Internet latency to avoid timeout. This value supersedes any a priori guidance from the exchange.
wseat	string array		White list 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 a priori. At most, only one of wseat and bseat should be used in the same request. Omission of both implies no seat restrictions.
bseat	string array		Block list of buyer seats (e.g., advertisers, agencies) restricted from bidding 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 a priori. At most, only one of wseat and bseat should be used in the same request. Omission of both implies no seat restrictions.

Value	Type	Level	Description
allimps	integer		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	string array		Array of allowed currencies for bids on this bid request using ISO-4217 alpha codes. Recommended only if the exchange accepts multiple currencies.
wlang	string array		White list of languages for creatives using ISO-639-1-alpha-2. Omission implies no specific restrictions, but buyers would be advised to consider language attribute in the Device and/or Content objects if available.
bcat	string array		Blocked advertiser categories using the IAB content categories. Refer to List 5.1.
badv	string array		Block list of advertisers by their domains (e.g., "ford.com").
bapp	string array		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.
source	object		A Sorce object (Section 3.2) that provides data about the inventory source and which entity makes the final decision.
regs	object		A Regs object (Section 3.3) that specifies any industry, legal, or governmental regulations in force for this request.
ext	object		Placeholder for exchange-specific extensions to OpenRTB.

3.2 Object : Source

This object describes the nature and behavior of the entity that is the source of the bid request upstream from the exchange. The primary purpose of this object is to define post-auction or upstream decisioning when the exchange itself does not control the final decision. A common example of this is header bidding, but it can also apply to upstream server entities such as another RTB exchange, a mediation platform, or an ad server combines direct campaigns with 3rd party demand in decisioning.

Source

Value	Type	Level	Description
fd	integer	recommended	Entity responsible for the final impression sale decision, where 0 = exchange, 1 = upstream source.
tid	string	recommended	Transaction ID that must be common across all participants in this bid request (e.g., potentially multiple exchanges).
pchain	string	recommended	Payment ID chain string containing embedded syntax described in the TAG Payment ID Protocol v1.0.
ext	object	required in some cases	Placeholder for exchange-specific extensions to OpenRTB.

3.2.1 Object : Source.Ext (For SupplyChainObject)

SourceExt

Value	Type	Level	Description
schain	Object	required in some cases	Contains the supplychain object. The SupplyChain object is composed primarily of a set of nodes where each node represents a specific entity that participates in the selling of a bid request. The entire chain of nodes from beginning to end would represent all sellers who were paid for an individual bid request. Fully described here on the → https://github.com/InteractiveAdvertisingBureau/openrtb/blob/master/supplychainobject.m

3.2.2 Object : SupplyChain (For SupplyChainObject)

SupplyChain

Value	Type	Level	Description
complete	integer	required	Flag indicating whether the chain contains all nodes involved in the transaction leading back to the owner of the site, app or other medium of the inventory, where 0 = no, 1 = yes.
nodes	object array	required	Array of SupplyChainNode objects in the order of the chain. In a complete supply chain, the first node represents the initial advertising system and seller ID involved in the transaction, i.e. the owner of the site, app, or other medium. In an incomplete supply chain, it represents the first known node. The last node represents the entity sending this bid request.
ver	string	required	Version of the supply chain specification in use, in the format of "major.minor". For example, for version 1.0 of the spec, use the string "1.0".
ext	object		Placeholder for advertising-system specific extensions to this object.

3.2.3 Object : SupplyChainNode (For SupplyChainObject)

SupplyChainNode

Value	Type	Level	Description
asi	string	required	The canonical domain name of the SSP, Exchange, Header Wrapper, etc system that bidders connect to. This may be the operational domain of the system, if that is different than the parent corporate domain, to facilitate WHOIS and reverse IP lookups to establish clear ownership of the delegate system. This should be the same value as used to identify sellers in an ads.txt file if one exists.
sid	string	required	The identifier associated with the seller or reseller account within the advertising system. This must contain the same value used in transactions (i.e. OpenRTB bid requests) in the field specified by the SSP/exchange. Typically, in OpenRTB, this is publisher.id. For OpenDirect it is typically the publisher's organization ID.Should be limited to 64 characters in length.
rid	string		The OpenRTB RequestId of the request as issued by this seller.
name	string		The name of the company (the legal entity) that is paid for inventory transacted under the given seller_id. This value is optional and should NOT be included if it exists in the advertising system's sellers.json file.
domain	string		The business domain name of the entity represented by this node. This value is optional and should NOT be included if it exists in the advertising system's sellers.json file.
hp	integer	required	Indicates whether this node will be involved in the flow of payment for the inventory. When set to 1, the advertising system in the asi field pays the seller in the sid field, who is responsible for paying the previous node in the chain. When set to 0, this node is not involved in the flow of payment for the inventory. For version 1.0 of SupplyChain, this property should always be 1. It is explicitly required to be included as it is expected that future versions of the specification will introduce non-payment handling nodes. Implementers should ensure that they support this field and propagate it onwards when constructing SupplyChain objects in bid requests sent to a downstream advertising system.
ext	object		Placeholder for advertising-system specific extensions to this object.

3.3 Object : Regs

This object contains any legal, governmental, or industry regulations that apply to the request. The coppa flag signals whether or not the request falls under the United States Federal Trade Commission's regulations for the United States Children's Online Privacy Protection Act ("COPPA").

Regs

Value	Type	Level	Description
coppa	integer	required in some cases	Flag indicating if this request is subject to the COPPA regulations established by the USA FTC, where 0 = no, 1 = yes.

Value	Type	Level	Description
ext	object	required in some cases	

3.3.1 Object : Regs.Ext

RegsExt

Value	Type	Level	Description
gdpr	integer	required in some cases	Indicates whether the request is subject to the General Data Protection Regulation (GDPR) 0 = false 1 = true (the request is subject to GDPR).
us_privacy	string	required in some cases	Passes the user privacy status for requests which fall under CCPA regulations. The string uses 4 characters, e.g. "1YN-", passed in the following order. **1. Version Number** The IAB CCPA Specification version that applies to this string, passed as an integer. Currently only 1 is available. **2. Explicit Notice** (N = No, Y = Yes, - = Not Applicable) 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. **3. Opted-Out** (N = No, Y = Yes, - = Not Applicable) Indicates whether the user has opted-out of the sale of their personal information pursuant to 1798.120 and 1798.135. **4. LSPA** (N = No, Y = Yes, - = Not Applicable) 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.

3.4 Object : Imp

This object describes an ad placement or impression being auctioned. A single bid request can include multiple Imp objects, a use case for which might be an exchange that supports selling all ad positions on a given page. Each Imp object has a required ID so that bids can reference them individually.
The presence of Banner (Section 3.2.6), Video (Section 3.2.7), and/or Native (Section 3.2.9) objects subordinate to the Imp object indicates the type of impression being offered. The publisher can choose one such type which is the typical case or mix them at their discretion. However, any given bid for the impression must conform to one of the offered types.

Imp

Value	Type	Level	Description
id	string	required	A unique identifier for this impression within the context of the bid request (typically, starts with 1 and increments.
metric	object array		An array of Metric object (Section 3.5).
banner	object	required in some cases	A Banner object (Section 3.6); required if this impression is offered as a banner ad opportunity.
video	object	required in some cases	A Video object (Section 3.7); required if this impression is offered as a video ad opportunity.
audio	object	required in some cases	An Audio object (Section 3.8); required if this impression is offered as an audio ad opportunity
native	object	required in some cases	A Native object (Section 3.9); required if this impression is offered as a native ad opportunity.
pmp	object	required in some cases	A Pmp object (Section 3.11) containing any private marketplace deals in effect for this impression.
displaymanager	string		Name of ad mediation partner, SDK technology, or player responsible for rendering ad (typically video or mobile). Used by some ad servers to customize ad code by partner. Recommended for video and/or apps.

Value	Type	Level	Description
displaymanagerver	string		Version of ad mediation partner, SDK technology, or player responsible for rendering ad (typically video or mobile). Used by some ad servers to customize ad code by partner. Recommended for video and/or apps.
instl	integer		1 = the ad is interstitial or full screen, 0 = not interstitial.
tagid	string		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	float	recommended	Minimum bid for this impression expressed in CPM.
bidfloorcur	string	recommended	Currency specified using ISO-4217 alpha codes. This may be different from bid currency returned by bidder if this is allowed by the exchange.
clickbrowser	integer		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	integer		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	string array		Array of exchange-specific names of supported iframe busters.
exp	integer		Advisory as to the number of seconds that may elapse between the auction and the actual impression.
ext	object		Placeholder for exchange-specific extensions to OpenRTB.

4.3.1 Object : Imp.Ext (For SKAdNetwork)

ImpExt

Value	Type	Level	Description
skadn	object		Support for SKAdnetwork

4.3.2 Object : SKAdNetwork (For SKAdNetwork)

If a DSP has at least one SKAdNetworkItem in the publisher app's Info.plist we would include a new object in the bid request that provides the necessary information to create a signature. Object would only be present if both the SSP SDK version and the OS version (iOS 14.0+) support SKAdNetwork.

SKAdNetwork

Value	Type	Level	Description
version	string		Version of skadnetwork supported. Always "2.0" or higher. Dependent on both the OS version and the SDK version. Note: With the release of SKAdNetwork 2.1, this field is deprecated in favor of the BidRequest.imp.ext.skadn.versions to support an array of version numbers.
versions	string array		Array of strings containing the supported skadnetwork versions. Always "2.0" or higher. Dependent on both the OS version and the SDK version.
sourceapp	string		ID of publisher app in Apple's App Store. Should match app.bundle in OpenRTB 2.x and app.storeid in AdCOM 1.x
skadnetids	string array		A subset of SKAdNetworkItem entries in the publisher app's Info.plist, expressed as lowercase strings, that are relevant to the bid request. Recommended that this list not exceed 10. Note:BidRequest.imp.ext.skadn.skadnetlist.addl is the preferred method to express raw SKAdNetwork IDs.
skadnetlist	object		Object containing the IABTL list definition

Value	Type	Level	Description
ext	object		Placeholder for exchange-specific extensions to OpenRTB.

4.3.3 Object : SKAdNetList (For SKAdNetwork)

IABTL skadnetwork object list attributes.

SKAdNetList

Value	Type	Level	Description
max	integer		IABTL list containing the max entry ID of SKAdNetwork ID. Format will be: "max entity ID" where 306 in the example on the right will be all SKAdNetwork IDs entry number 306 and below.
excl	integer array		Comma separated list of integer IABTL registration IDs to be excluded from IABTL shared list.
addl	string array		Comma separated list of string SKAdNetwork IDs, expressed as lowercase strings, not included in the IABTL shared list. The intention of addl is to be the permanent home for raw SKAdNetwork IDs, migrating away from BidRequest.imp.ext.skadn.skadnetids. Recommended that this list not exceed 10.
ext	object		Placeholder for exchange-specific extensions to OpenRTB.

3.5 Object : Metric

This object is associated with an impression as an array of metrics. These metrics can offer insight into the impression to assist with decisioning such as average recent viewability, click-through rate, etc. Each metric is identified by its type, reports the value of the metric, and optionally identifies the source or vendor measuring the value.

Metric

Value	Type	Level	Description
type	string	required	Type of metric being presented using exchange curated string names which should be published to bidders a priori.
value	float	required	Number representing the value of the metric. Probabilities must be in the range 0.0 – 1.0.
vendor	string	recommended	Source of the value using exchange curated string names which should be published to bidders a priori. If the exchange itself is the source versus a third party, “EXCHANGE” is recommended.
ext	object		Placeholder for exchange-specific extensions to OpenRTB.

3.6 Object : Banner

This object represents the most general type of impression. Although the term “banner” may have very specific meaning in other contexts, here it can be many things including a simple static image, an expandable ad unit, or even in-banner video (refer to the Video object in Section 3.7 for the more generalized and full featured video ad units). An array of Banner objects can also appear within the Video to describe optional companion ads defined in the VAST specification.
The presence of a Banner as a subordinate of the Imp object indicates that this impression is offered as a banner type impression. At the publisher’s discretion, that same impression may also be offered as video, audio, and/or native by also including as Imp subordinates objects of those types. However, any given bid for the impression must conform to one of the offered types.

Banner

Value	Type	Level	Description
format	object array	recommended	Array of format objects (Section 3.10) representing the banner sizes permitted. If none are specified, then use of the h and w attributes is highly recommended.

Value	Type	Level	Description
w	integer	required	Exact width in device independent pixels (DIPS); recommended if no format objects are specified.
h	integer	required	Exact height in device independent pixels (DIPS); recommended if no format objects are specified.
btype	integer array		Blocked banner ad types. Refer to List 5.2.
battr	integer array		Blocked creative attributes. Refer to List 5.3.
pos	integer		Ad position on screen. Refer to List 5.4.
mimes	string array		Content MIME types supported. Popular MIME types may include “application/x-shockwave-flash”, “image/jpg”, and “image/gif”.
topframe	integer		Indicates if the banner is in the top frame as opposed to an iframe, where 0 = no, 1 = yes.
expdir	integer array		Directions in which the banner may expand. Refer to List 5.5.
api	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.
id	string		Unique identifier for this banner object. Recommended when Banner objects are used with a Video object (Section 3.7) to represent an array of companion ads. Values usually start at 1 and increase with each object; should be unique within an impression.
vcm	integer		Relevant only for Banner objects used with a Video object (Section 3.7) in an array of companion ads. Indicates the companion banner rendering mode relative to the associated video, where 0 = concurrent, 1 = end-card.
ext	object		Placeholder for exchange-specific extensions to OpenRTB.

3.7 Object : Video

This object represents an in-stream video impression. Many of the fields are non-essential for minimally viable transactions, but are included to offer fine control when needed. Video in OpenRTB generally assumes compliance with the VAST standard. As such, the notion of companion ads is supported by optionally including an array of Banner objects (refer to the Banner object in Section 3.6) that define these companion ads.
The presence of a Video as a subordinate of the Imp object indicates that this impression is offered as a video type impression. At the publisher’s discretion, that same impression may also be offered as banner, audio, and/or native by also including as Imp subordinates objects of those types. However, any given bid for the impression must conform to one of the offered types.

Video

Value	Type	Level	Description
mimes	string array	required	Content MIME types supported (e.g., “video/x-ms-wmv”, “video/mp4”).
minduration	integer	recommended	Minimum video ad duration in seconds.
maxduration	integer	recommended	Maximum video ad duration in seconds.
protocols	integer array	recommended	Array of supported video protocols. Refer to List 5.8. At least one supported protocol must be specified in either the protocol or protocols attribute.
w	integer	recommended	Width of the video player in device independent pixels (DIPS).
h	integer	recommended	Height of the video player in device independent pixels (DIPS).
startdelay	integer	recommended	Indicates the start delay in seconds for pre-roll, mid-roll, or post-roll ad placements. Refer to List 5.12 for additional generic values.
placement	integer		Placement type for the impression. Refer to List 5.9.

Value	Type	Level	Description
linearity	integer		Indicates if the impression must be linear, nonlinear, etc. If none specified, assume all are allowed. Refer to List 5.7.
skip	integer		Indicates if the player will allow the video to be skipped, where 0 = no, 1 = yes. If a bidder sends markup/creative that is itself skippable, the Bid object should include the attr array with an element of 16 indicating skippable video. Refer to List 5.3
skipmin	integer		Videos of total duration greater than this number of seconds can be skippable; only applicable if the ad is skippable.
skipafter	integer		Number of seconds a video must play before skipping is enabled; only applicable if the ad is skippable.
sequence	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	integer array		Blocked creative attributes. Refer to List 5.3
maxextended	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 maxduration value.
minbitrate	integer		Minimum bit rate in Kbps.
maxbitrate	integer		Maximum bit rate in Kbps.
boxingallowed	integer		Indicates if letter-boxing of 4:3 content into a 16:9 window is allowed, where 0 = no, 1 = yes.
playbackmethod	integer array		Playback methods that may be in use. If none are specified, any method may be used. Refer to List 5.10. 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. It is strongly advised to use only the first element of this array in preparation for this change.
playbackend	integer		The event that causes playback to end. Refer to List 5.11.
delivery	integer array		Supported delivery methods (e.g., streaming, progressive). If none specified, assume all are supported. Refer to List 5.15.
pos	integer		Ad position on screen. Refer to List 5.4.
companionad	object array		Array of Banner objects (Section 3.6) if companion ads are available.
api	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	integer array		Supported VAST companion ad types. Refer to List 5.14. Recommended if companion Banner objects are included via the companionad array. If one of these banners will be rendered as an end-card, this can be specified using the vcm attribute with the particular banner (Section 3.6).
ext	object	required in some cases	Placeholder for exchange-specific extensions to OpenRTB.

3.7.1 Object : Video.Ext

VideoExt

Value	Type	Level	Description
rewarded	integer	required	Indicates whether the ad is being rendered as part of a rewarded/incentivised user experience, where: * 0 : non-rewarded * 1 : rewarded * If omitted, non-rewarded can be assumed.
skippable	integer		Indicates whether the video ad may be skippable(i.e. contain a skip button). The values are : * 0 : allow skippable * 1 : require skippable * 2 : deny skippable

Value	Type	Level	Description
outstream	integer		Indicates that the video is outstream, for example * 0 : no outstream * 1 : outstream

3.8 Object : Audio

This object represents an audio type impression. Many of the fields are non-essential for minimally viable transactions, but are included to offer fine control when needed. Audio in OpenRTB generally assumes compliance with the DAAST standard. As such, the notion of companion ads is supported by optionally including an array of Banner objects (refer to the Banner object in Section 3.2.6) that define these companion ads.
The presence of a Audio as a subordinate of the Imp object indicates that this impression is offered as an audio type impression. At the publisher's discretion, that same impression may also be offered as banner, video, and/or native by also including as Imp subordinates objects of those types. However, any given bid for the impression must conform to one of the offered types.

Audio

Value	Type	Level	Description
mimes	string array	required	Content MIME types supported (e.g., "audio/mp4").
minduration	integer	recommended	Minimum audio ad duration in seconds.
maxduration	integer	recommended	Maximum audio ad duration in seconds
protocols	integer array	recommended	Array of supported audio protocols. Refer to List 5.8.
startdelay	integer	recommended	Indicates the start delay in seconds for pre-roll, mid-roll, or post-roll ad placements. Refer to List 5.12.
sequence	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	integer array		Blocked creative attributes. Refer to List 5.3.
maxextended	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 maxduration value.
minbitrate	integer		Minimum bit rate in Kbps.
maxbitrate	integer		Maximum bit rate in Kbps
delivery	integer array		Supported delivery methods (e.g., streaming, progressive). If none specified, assume all are supported. Refer to List 5.15.
companionad	object array		Array of Banner objects (Section 3.2.6) if companion ads are available.
api	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	integer array		Supported DAAST companion ad types. Refer to List 5.14. Recommended if companion Banner objects are included via the companionad array.
maxseq	integer		The maximum number of ads that can be played in an ad pod.
feed	integer		Type of audio feed. Refer to List 5.16.
stitched	integer		Indicates if the ad is stitched with audio content or delivered independently, where 0 = no, 1 = yes.
nvol	integer		Volume normalization mode. Refer to List 5.17.
ext	object		Placeholder for exchange-specific extensions to OpenRTB.

3.9 Object : Native

This object represents a native type impression. Native ad units are intended to blend seamlessly into the surrounding content (e.g., a sponsored Twitter or Facebook post). As such, the response must be well-structured to afford the publisher fine-grained control over rendering.
The Native Subcommittee has developed a companion specification to OpenRTB called the Dynamic Native Ads API. It defines the request parameters and response markup structure of native ad units. This object provides the means of transporting request parameters as an opaque string so that the specific parameters can evolve separately under the auspices of the Dynamic Native Ads API. Similarly, the ad markup served will be structured according to that specification.
The presence of a Native as a subordinate of the Imp object indicates that this impression is offered as a native type impression. At the publisher's discretion, that same impression may also be offered as banner, video, and/or audio by also including as Imp subordinates objects of those types. However, any given bid for the impression must conform to one of the offered types.

Native

Value	Type	Level	Description
request	string	required	Request payload complying with the Native Ad Specification.
ver	string	recommended	Version of the Dynamic Native Ads API to which request complies; highly recommended for efficient parsing.
api	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.
battr	integer array		Blocked creative attributes. Refer to List 5.3
ext	object		Placeholder for exchange-specific extensions to OpenRTB.

3.9.1 Object : Native Request

The Native Object defines the native advertising opportunity available for bid via this bid request. It will be included as a JSON-encoded string in the bid request's imp.native field

Native Request

Value	Type	Level	Description
ver	string		Version of the Native Markup version in use. Currently always set at 1.2
context	integer	recommended	The context in which the ad appears.
contextsubtype	integer		A more detailed context in which the ad appears. See Table of Context SubType IDs below for a list of supported context subtypes.
plcmttype	integer	recommended	Array of advertiser domains (e.g., advertiser.com) allowed to bid on this deal. Omission implies no advertiser restrictions.
plcmtcnt	integer		The number of identical placements in this Layout.
seq	integer		0 for the first ad,1 for the second ad,and so on.
assets	object array	required	An array of Asset Objects.Any bid response must comply with
aurlsupport	integer		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	integer		Whether the supply source / impression supports returning a dco url instead of an asset object.
eventtrackers	object array	required in some cases	Specifies what type of event tracking is supported
privacy	integer	recommended	Set to 1 when the native ad supports buyer-specific privacy notice
ext	object		Placeholder for exchange-specific extensions to OpenRTB.

3.9.2 Object : Native Assets

The main container object for each asset requested or supported by Exchange on behalf of the rendering client. Any object that is required is to be flagged as such. Only one of the {title,img,video,data} objects should be present in each object. All others should be null/absent. The id is to be unique within the AssetObject array so that the response can be aligned.
To be more explicit, it is the ID of each asset object that maps the response to the request. So if a request for a title object is sent with id 1, then the response containing the title should have an id of 1.

Assets

Value	Type	Level	Description
id	integer	required	Unique asset ID, assigned by exchange. Typically a counter for the array.
required	integer		Set to 1 if asset is required (exchange will not accept a bid without it)
title	object	recommended	Title object for title assets. See TitleObject definition.
img	object	recommended	Image object for image assets. See ImageObject definition.
video	object		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	object	recommended	Data object for brand name, description, ratings, prices etc. See DataObject definition
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

3.9.3 Object : Native Assets Title

The Title object is to be used for title element of the Native ad.

Title

Value	Type	Level	Description
len	integer	required	Maximum length of the text in the title element. Recommended to be 25, 90, or 140.
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

3.9.4 Object : Native Assets Image

The Image object to be used for all image elements of the Native ad such as Icons, Main Image, etc.

Image

Value	Type	Level	Description
type	integer		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	integer		Width of the image in pixels.
wmin	integer	recommended	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	integer		Height of the image in pixels.
hmin	integer	recommended	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.

Value	Type	Level	Description
mimes	string array		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	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

3.9.5 Object : Native Assets Video

The video object to be used for all video elements supported in the Native Ad.

Video

Value	Type	Level	Description
mimes	string array	required	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	integer	required	Minimum video ad duration in seconds.
maxduration	integer	required	Maximum video ad duration in seconds
protocols	integer array	required	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	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.

3.9.6 Object : Native Assets Data

The Data Object is to be used for all non-core elements of the native unit such as Brand Name, Ratings, Review Count, Stars, Download count, descriptions etc.

Data

Value	Type	Level	Description
type	integer	required	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	integer		Maximum length of the text in the element’s 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

3.9.7 Object : Event Trackers

The event trackers object specifies the types of events the bidder can request to be tracked in the bid response, and which types of tracking are available for each event type, and is included as an array in the request.

EventTrackers

Value	Type	Level	Description
event	integer	required	Type of event available for tracking.
methods	integer array	required	Array of the types of tracking available for the given event.
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

3.10 Object : Format

This object represents an allowed size (i.e., height and width combination) or Flex Ad parameters for a banner impression. These are typically used in an array where multiple sizes are permitted. It is recommended that either the w/h pair or the wratio/hratio/wmin set (i.e., for Flex Ads) be specified.

Format

Value	Type	Level	Description
w	integer		Width in device independent pixels (DIPS).
h	integer		Height in device independent pixels (DIPS).
wratio	integer		Relative width when expressing size as a ratio.
hratio	integer		Relative height when expressing size as a ratio.
wmin	integer		The minimum width in device independent pixels (DIPS) at which the ad will be displayed the size is expressed as a ratio.
ext	object		Placeholder for exchange-specific extensions to OpenRTB.

3.11 Object : Pmp

This object is the private marketplace container for direct deals between buyers and sellers that may pertain to this impression. The actual deals are represented as a collection of Deal objects. Refer to Section 7.3 for more details.

Pmp

Value	Type	Level	Description
private_auction	integer		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	object array		Array of Deal (Section 3.12) objects that convey the specific deals applicable to this impression.
ext	object		Placeholder for exchange-specific extensions to OpenRTB.

3.12 Object : Deal

This object constitutes a specific deal that was struck a priori between a buyer and a seller. Its presence with the Pmp collection indicates that this impression is available under the terms of that deal. Refer to Section 7.3 for more details.

Deal

Value	Type	Level	Description
id	string	required	A unique identifier for the direct deal.
bidfloor	float		Minimum bid for this impression expressed in CPM.
bidfloorcur	string		Currency specified using ISO-4217 alpha codes. This may be different from bid currency returned by bidder if this is allowed by the exchange.
at	integer		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.
wseat	string array		Whitelist of buyer seats (e.g., advertisers, agencies) allowed to bid on this deal. IDs of seats and the buyer's customers to which they refer must be coordinated between bidders and the exchange a priori. Omission implies no seat restrictions.
wadomain	string array		Array of advertiser domains (e.g., advertiser.com) allowed to bid on this deal. Omission implies no advertiser restrictions.

Value	Type	Level	Description
ext	object		Placeholder for exchange-specific extensions to OpenRTB.

3.13 Object : Site

This object should be included if the ad supported content is a website as opposed to a non-browser application. A bid request must not contain both a Site and an App object. At a minimum, it is useful to provide a site ID or page URL, but this is not strictly required.

Site

Value	Type	Level	Description
id	string	recommended	Exchange-specific site ID.
name	string		Site name (may be aliased at the publisher's request).
domain	string		Domain of the site (e.g., "mysite.foo.com").
cat	string array		Array of IAB content categories of the site. Refer to List 5.1.
sectioncat	string array		Array of IAB content categories that describe the current section of the site. Refer to List 5.1.
pagecat	string array		Array of IAB content categories that describe the current page or view of the site. Refer to List 5.1.
page	string		URL of the page where the impression will be shown.
ref	string		Referrer URL that caused navigation to the current page.
search	string		Search string that caused navigation to the current page.
mobile	integer		Indicates if the site has been programmed to optimize layout when viewed on mobile devices, where 0 = no, 1 = yes.
privacypolicy	integer		Indicates if the site has a privacy policy, where 0 = no, 1 = yes.
publisher	object		Details about the Publisher (Section 3.15) of the site.
content	object		Details about the Content (Section 3.16) within the site.
keywords	string		Comma separated list of keywords about the site.
ext	object		Placeholder for exchange-specific extensions to OpenRTB.

3.14 Object : App

This object should be included if the ad supported content is a non-browser application (typically in mobile) as opposed to a website. A bid request must not contain both an App and a Site object. At a minimum, it is useful to provide an App ID or bundle, but this is not strictly required.

App

Value	Type	Level	Description
id	string	recommended	Exchange-specific app ID.
name	string		App name (may be aliased at the publisher's request).
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 typically a numeric ID.
domain	string		Domain of the app (e.g., "mygame.foo.com").

Value	Type	Level	Description
storeurl	string		App store URL for an installed app; for IQG 2.1 compliance.
cat	string array		Array of IAB content categories of the app. Refer to List 5.1.
sectioncat	string array		Array of IAB content categories that describe the current section of the app. Refer to List 5.1.
pagecat	string array		Array of IAB content categories that describe the current page or view of the app. Refer to List 5.1.
ver	string		Application version.
privacypolicy	integer		Indicates if the app has a privacy policy, where 0 = no, 1 = yes.
paid	integer		0 = app is free, 1 = the app is a paid version.
publisher	object		Details about the Publisher (Section 3.15) of the app.
content	object		Details about the Content (Section 3.16) within the app.
keywords	string		Comma separated list of keywords about the app.
ext	object		Placeholder for exchange-specific extensions to OpenRTB.

3.15 Object : Publisher

This object describes the publisher of the media in which the ad will be displayed. The publisher is typically the seller in an OpenRTB transaction.

Publisher

Value	Type	Level	Description
id	string		Exchange-specific publisher ID.
name	string		Publisher name (may be aliased at the publisher's request).
cat	string array		Array of IAB content categories that describe the publisher. Refer to List 5.1.
domain	string		Highest level domain of the publisher (e.g., "publisher.com").
ext	object		Placeholder for exchange-specific extensions to OpenRTB.

3.16 Object : Content

This object describes the content in which the impression will appear, which may be syndicated or non-syndicated content. This object may be useful when syndicated content contains impressions and does not necessarily match the publisher's general content. The exchange might or might not have knowledge of the page where the content is running, as a result of the syndication method. For example might be a video impression embedded in an iframe on an unknown web property or device.

Content

Value	Type	Level	Description
id	string		ID uniquely identifying the content.
episode	integer		Episode number.
title	string		Content title. Video Examples: "Search Committee" (television), "A New Hope" (movie), or "Endgame" (made for web). Non-Video Example: "Why an Antarctic Glacier Is Melting So Quickly" (Time magazine article).

Value	Type	Level	Description
series	string		Content series. Video Examples: “The Office” (television), “Star Wars” (movie), or “Arby ‘N’ The Chief” (made for web). Non-Video Example: “Ecocentric” (Time Magazine blog).
season	string		Content season (e.g., “Season 3”).
artist	string		Artist credited with the content.
genre	string		Genre that best describes the content (e.g., rock, pop, etc).
album	string		Album to which the content belongs; typically for audio.
isrc	string		International Standard Recording Code conforming to ISO-3901.
producer	object		Details about the content Producer (Section 3.17).
url	string		URL of the content, for buy-side contextualization or review.
cat	string array		Array of IAB content categories that describe the content producer. Refer to List 5.1.
prodq	integer		Production quality. Refer to List 5.13.
videoquality	integer		Note: Deprecated in favor of prodq. Video quality. Refer to List 5.13.
context	integer		Type of content (game, video, text, etc.). Refer to List 5.18.
contentrating	string		Content rating (e.g., MPAA).
userrating	string		User rating of the content (e.g., number of stars, likes, etc.).
qagmediarating	integer		Media rating per IQG guidelines. Refer to List 5.19.
keywords	string		Comma separated list of keywords describing the content.
livestream	integer		0 = not live, 1 = content is live (e.g., stream, live blog)
sourcerelationship	integer		0 = indirect, 1 = direct
len	integer		Length of content in seconds; appropriate for video or audio.
language	string		Content language using ISO-639-1-alpha-2.
embeddable	integer		Indicator of whether or not the content is embeddable (e.g., an embeddable video player), where 0 = no, 1 = yes.
data	object array		Additional content data. Each Data object (Section 3.2.21) represents a different data source
ext	object		Placeholder for exchange-specific extensions to OpenRTB.

3.17 Object : Producer

This object defines the producer of the content in which the ad will be shown. This is particularly useful when the content is syndicated and may be distributed through different publishers and thus when the producer and publisher are not necessarily the same entity.

Producer

Value	Type	Level	Description
id	string		Content producer or originator ID. Useful if content is syndicated and may be posted on a site using embed tags.
name	string		Content producer or originator name (e.g., “Warner Bros”).
cat	string array		Array of IAB content categories that describe the content producer. Refer to List 5.1.
domain	string		Highest level domain of the content producer (e.g., “producer.com”).

Value	Type	Level	Description
ext	object		Placeholder for exchange-specific extensions to OpenRTB.

3.18 Object : Device

This object provides information pertaining to the device through which the user is interacting. Device information includes its hardware, platform, location, and carrier data. The device can refer to a mobile handset, a desktop computer, set top box, or other digital device.

Device

Value	Type	Level	Description
ua	string	recommended	Browser user agent string.
geo	object	recommended	Location of the device assumed to be the user's current location defined by a Geo object (Section 3.19).
dnt	integer	recommended	Standard "Do Not Track" flag as set in the header by the browser, where 0 = tracking is unrestricted, 1 = do not track.
lmt	integer	recommended	"Limit Ad Tracking" signal commercially endorsed (e.g., iOS, Android), where 0 = tracking is unrestricted, 1 = tracking must be limited per commercial guidelines.
ip	string	recommended	IPv4 address closest to device.
ipv6	string		IP address closest to device as IPv6.
devicetype	integer		The general type of device. Refer to List 5.21.
make	string		Device make (e.g., "Apple").
model	string		Device model (e.g., "iPhone").
os	string		Device operating system (e.g., "iOS").
osv	string		Device operating system version (e.g., "3.1.2").
hwv	string		Hardware version of the device (e.g., "5S" for iPhone 5S).
h	integer		Physical height of the screen in pixels.
w	integer		Physical width of the screen in pixels.
ppi	integer		Screen size as pixels per linear inch.
pxratio	float		The ratio of physical pixels to device independent pixels.
js	integer		Support for JavaScript, where 0 = no, 1 = yes.
geofetch	integer		Indicates if the geolocation API will be available to JavaScript code running in the banner, where 0 = no, 1 = yes.
flashver	string		Version of Flash supported by the browser.
language	string		Browser language using ISO-639-1-alpha-2.
carrier	string		Carrier or ISP (e.g., "VERIZON") using exchange curated string names which should be published to bidders a priori.
mccmnc	string		Mobile carrier as the concatenated MCC-MNC code (e.g., "310-005" identifies Verizon Wireless CDMA in the USA). Refer to https://en.wikipedia.org/wiki/Mobile_country_code for further examples. Note that the dash between the MCC and MNC parts is required to remove parsing ambiguity.
connectiontype	integer		Network connection type. Refer to List 5.22.
ifa	string		ID sanctioned for advertiser use in the clear (i.e., not hashed).

Value	Type	Level	Description
didsha1	string		Hardware device ID (e.g., IMEI); hashed via SHA1
didmd5	string		Hardware device ID (e.g., IMEI); hashed via MD5.
dpidsha1	string		Platform device ID (e.g., Android ID); hashed via SHA1.
dpidmd5	string		Platform device ID (e.g., Android ID); hashed via MD5.
macsha1	string		MAC address of the device; hashed via SHA1.
macmd5	string		MAC address of the device; hashed via MD5.
ext	object		Placeholder for exchange-specific extensions to OpenRTB.

3.18.1 Object : Device.Ext (For SKAdNetwork, CTV/OTT)

If the IDFA is not available, DSPs require an alternative, limited-scope identifier in order to provide basic frequency capping functionality to advertisers. The IDFV is the same for apps from the same vendor but different across vendors. Please refer to Apple's Guidelines for further information about when it can be accessed and used.

DSPs may also want to understand what is the status of a user on iOS 14+. The `atts` field will pass the AppTrackingTransparency Framework's authorization status.

DNT, LMT and App Tracking Transparency Guidance

(Pending iOS 14 Golden Master) For iOS 14 and above, the 'DNT' and 'LMT' parameters will be informed by the 'ATTS' status, where

- "DNT" or "LMT" = 1 when "ATTS" = 0, 1, 2
- "LMT" or "DNT" = 0 when "ATTS" = 3

DeviceExt

Value	Type	Level	Description
atts	integer		**for SkAdNetwork** (iOS Only) An integer passed to represent the app's app tracking authorization status, where 0 = not determined 1 = restricted 2 = denied 3 = authorized
ifv	string		**for SkAdNetwork** IDFV of the device in that publisher. Listed as ifv to match ifa field format.
ifa_type	string		**for identify CTV/OTT** Indicates the origin of the device.ifa field, whether it was provided from the device itself or generated by a publisher or Supplier in the supply chain. Takes the following values from the Guidelines for Identifier for Advertising (IFA) on CTV/OTT platforms - "aaid" Android TV - "rida" Roku - "afai" Amazon Fire - "idfa" Apple tvOS - "msai" Xbox/Microsoft - "dpid" Generic device platform ID - "ppid" Publisher provided ID - "sspid" SSP provided ID - "sessionid" Short-lived session ID (frequency capping only)

3.19 Object : Geo

This object encapsulates various methods for specifying a geographic location. When subordinate to a Device object, it indicates the location of the device which can also be interpreted as the user's current location. When subordinate to a User object, it indicates the location of the user's home base (i.e., not necessarily their current location).
The lat/lon attributes should only be passed if they conform to the accuracy depicted in the type attribute. For example, the centroid of a geographic region such as postal code should not be passed.

Geo

Value	Type	Level	Description
lat	float		Latitude from -90.0 to +90.0, where negative is south.
lon	float		Longitude from -180.0 to +180.0, where negative is west.

Value	Type	Level	Description
type	integer		Source of location data; recommended when passing lat/lon. Refer to List 5.20.
accuracy	integer		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	integer		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	integer		Service or provider used to determine geolocation from IP address if applicable (i.e., type = 2). Refer to List 5.23.
country	string		Country code using ISO-3166-1-alpha-3
region	string		Region code using ISO-3166-2; 2-letter state code if USA.
regionfips104	string		Region of a country using FIPS 10-4 notation. While OpenRTB supports this attribute, it has been withdrawn by NIST in 2008.
metro	string		Google metro code; similar to but not exactly Nielsen DMAs. See Appendix A for a link to the codes.
city	string		City using United Nations Code for Trade & Transport Locations. See Appendix A for a link to the codes
zip	string		Zip or postal code.
utcoffset	integer		Local time as the number +/- of minutes from UTC.
ext	object		Placeholder for exchange-specific extensions to OpenRTB.

3.20 Object : User

This object contains information known or derived about the human user of the device (i.e., the audience for advertising). The user id is an exchange artifact and may be subject to rotation or other privacy policies. However, this user ID must be stable long enough to serve reasonably as the basis for frequency capping and retargeting.

User

Value	Type	Level	Description
id	string	recommended	Exchange-specific ID for the user. At least one of id or buyeruid is recommended.
buyeruid	string	recommended	Buyer-specific ID for the user as mapped by the exchange for the buyer. At least one of buyeruid or id is recommended.
yob	integer		Year of birth as a 4-digit integer.
gender	string		Gender, where "M" = male, "F" = female, "O" = known to be other (i.e., omitted is unknown).
keywords	string		Comma separated list of keywords, interests, or intent.
customdata	string		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	object		Location of the user's home base defined by a Geo object (Section 3.19). This is not necessarily their current location
data	object array		Additional user data. Each Data object (Section 3.21) represents a different data source.
ext	object		Placeholder for exchange-specific extensions to OpenRTB.

3.20.1 Object : UserExt

UserExt

Value	Type	Level	Description
consent	string		Declaration that the user has consented to having his or her data collected by the publisher's site, as mandated by the GDPR

3.21 Object : Data

The data and segment objects together allow additional data about the related object (e.g., user, content) to be specified. This data may be from multiple sources whether from the exchange itself or third parties as specified by the id field. A bid request can mix data objects from multiple providers. The specific data providers in use should be published by the exchange a priori to its bidders.

Data

Value	Type	Level	Description
id	string		Exchange-specific ID for the data provider.
name	string		Exchange-specific name for the data provider.
segment	object array		Array of Segment (Section 3.22) objects that contain the actual data values.
ext	object		Placeholder for exchange-specific extensions to OpenRTB.

3.22 Object : Segment

Segment objects are essentially key-value pairs that convey specific units of data. The parent Data object is a collection of such values from a given data provider. The specific segment names and value options must be published by the exchange a priori to its bidders.

Segment

Value	Type	Level	Description
id	string		ID of the data segment specific to the data provider.
name	string		Name of the data segment specific to the data provider.
value	string		String representation of the data segment value.
ext	object		Placeholder for exchange-specific extensions to OpenRTB.

4. Bid Response Specification

Object List

Object	Section	Description
bidresponse	4.1	Top-level object
seatbid	4.2	Collection of bids made by the bidder on behalf of a specific seat.
bid	4.3	An offer to buy a specific impression under certain business terms.
native response	4.4	

4.1 Object : BidResponse

This object is the top-level bid response object (i.e., the unnamed outer JSON object). 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 at least one bid for an impression. Other attributes are optional.
To express a “no-bid”, the options are to return an empty response with HTTP 204. Alternately if the bidder wishes to

convey to the exchange a reason for not bidding, just a BidResponse object is returned with a reason code in the nbr attribute.

BidResponse

Value	Type	Level	Description
id	string	required	ID of the bid request to which this is a response.
seatbid	object array	required	Array of seatbid objects; 1+ required if a bid is to be made.
bidid	string		Bidder generated response ID to assist with logging/tracking.
cur	string		Bid currency using ISO-4217 alpha codes.
customdata	string		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.
nbr	integer		Reason for not bidding. Refer to List 5.24.
ext	object		Placeholder for bidder-specific extensions to OpenRTB.

4.2 Object : SeatBid

A bid response can contain multiple SeatBid objects, each on behalf of a different bidder seat and each containing one or more individual bids. If multiple impressions are presented in the request, the group attribute can be used to specify if a seat is willing to accept any impressions that it can win (default) or if it is only interested in winning any if it can win them all as a group.

SeatBid

Value	Type	Level	Description
bid	object array	required	Array of 1+ Bid objects (Section 4.3) each related to an impression. Multiple bids can relate to the same impression.
seat	string		ID of the buyer seat (e.g., advertiser, agency) on whose behalf this bid is made.
group	integer		0 = impressions can be won individually; 1 = impressions must be won or lost as a group.
ext	object		Placeholder for bidder-specific extensions to OpenRTB.

4.3 Object : Bid

A SeatBid object contains one or more Bid objects, each of which relates to a specific impression in the bid request via the impid attribute and constitutes an offer to buy that impression for a given price.

Bid

Value	Type	Level	Description
id	string	required	Bidder generated bid ID to assist with logging/tracking.
impid	string	required	ID of the Imp object in the related bid request.
price	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).
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. Substitution macros (Section 4.5) may be included in both the URL and optionally returned markup.

Value	Type	Level	Description
burl	string		Billing notice URL called by the exchange when a winning bid becomes billable based on exchange-specific business policy (e.g., typically delivered, viewed, etc.). Substitution macros (Section 4.5) may be included.
lurl	string		Loss notice URL called by the exchange when a bid is known to have been lost. Substitution macros (Section 4.5) may be included. Exchange-specific policy may preclude support for loss notices or the disclosure of winning clearing prices resulting in ${AUCTION_PRICE} macros being removed (i.e., replaced with a zero-length string).
adm	string		Optional means of conveying ad markup in case the bid wins; supersedes the win notice if markup is included in both. Substitution macros (Section 4.5) may be included.
adid	string		ID of a preloaded ad to be served if the bid wins.
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.
tactic	string		Tactic ID to enable buyers to label bids for reporting to the exchange the tactic through which their bid was submitted. The specific usage and meaning of the tactic ID should be communicated between buyer and exchanges a priori.
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.
qagmediarating	integer		Creative media rating per IQG guidelines. Refer to List 5.19.
language	string		Language of the creative using ISO-639-1-alpha-2. The non-standard code "xx" may also be used if the creative has no linguistic content (e.g., a banner with just a company logo).
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).
wratio	integer		Relative width of the creative when expressing size as a ratio. Required for Flex Ads.
hratio	integer		Relative height of the creative when expressing size as a ratio. Required for Flex Ads.
exp	integer		Advisory as to the number of seconds the bidder is willing to wait between the auction and the actual impression.
ext	object		Placeholder for bidder-specific extensions to OpenRTB.

4.3.1 Object : Bid.Ext (For SKAdNetwork)

BidExt

Value	Type	Level	Description
skadn	object		Support for SKAdnetwork

4.3.2 Object : SKAdNetwork (For SKAdNetwork)

If the bid request included the `BidRequest.imp.ext.skadn` object, then a DSP could choose to add the following object to their bid response. Please refer to Apple's documentation for submitting the correctly formatted values. If the object is present in the response, then SSP would submit the click data and signature to loadProduct() for attribution.

Note: Due to breaking changes introduced by Apple in SKAdNetwork v2.2 to support View Through Attribution and fidelity-type, several structural changes to the bid response were required to support multiple fidelity types.

SKAdNetwork

Value	Type	Level	Description
version	string		Version of SKAdNetwork desired. Must be 2.0 or above.
network	string		Ad network identifier used in signature. Should match one of the items in the skadnetids array in the request
campaign	string		Campaign ID compatible with Apple's spec. As of 2.0, should be an integer between 1 and 100, expressed as a string
itunesitem	string		ID of advertiser's app in Apple's app store. Should match BidResponse.seatbid.bid.bundle
fidelities	object array		Supports multiple fidelity types introduced in SKAdNetwork v2.2
nonce	string		An id unique to each ad response. Refer to Apple's documentation for the proper UUID format requirements Note: With the release of SKAdNetwork v2.2, this field is deprecated in favor of the BidResponse.seatbid.bid.ext.skadn.fidelities.nonce to support multiple fidelity-types.
sourceapp	string		ID of publisher's app in Apple's app store. Should match BidRequest.imp.ext.skad.sourceapp
timestamp	string		Unix time in millis string used at the time of signature Note: With the release of SKAdNetwork 2.2, this field is deprecated in favor of the BidResponse.seatbid.bid.ext.skadn.fidelities.timestamp to support multiple fidelity-types.
signature	string		SKAdNetwork signature as specified by Apple Note: With the release of SKAdNetwork 2.2, this field is deprecated in favor of the BidResponse.seatbid.bid.ext.skadn.fidelities.signature to support multiple fidelity-types.
ext	object		Placeholder for exchange-specific extensions to OpenRTB.

4.3.3 Object : Fidelity (For SKAdNetwork)

Fields that should have different values for the different fidelity types (e.g. `fidelity`, `nonce`, `signature`) are wrapped into an array of objects.

Note: Adding `timestamp` to this list allows bidders to parallelize the cryptography portions of creating their bid response when supporting multiple fidelities. The same timestamp can be used across fidelities if desired but this move provides bidders with greater implementation flexiblity.

Fidelity

Value	Type	Level	Description
fidelity	integer		The fidelity-type of the attribution to track
nonce	string		An id unique to each ad response. Refer to Apple's documentation for the proper UUID format requirements
timestamp	string		Unix time in millis string used at the time of signature
signature	string		SKAdNetwork signature as specified by Apple
ext	object		Placeholder for exchange-specific extensions to OpenRTB.

4.4 Object : Native Response

The native object is the top level JSON object which identifies a native response.
Note that bid.adm is a string field.
The content of the adm field will be the JSON encoded JSON object.

Native Response

Value	Type	Level	Description
ver	string	recommended	Version of the Native Markup version in use.
assets	object array	recommended	List of native ad's assets. Required if no assetsurl. Recommended as fallback even if assetsurl is provided.
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.
dcourl	string		URL where a dynamic creative specification may be found for populating this ad, per the Dynamic Content Ads Specification. Note this is a beta option as the interpretation of the Dynamic Content Ads Specification and how to assign those elements into a native ad is outside the scope of this spec and must be agreed offline between the parties or as may be specified in a future revision of the Dynamic Content Ads spec. Where present, overrides the asset object in the response.
link	object	required	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.
imptrackers	string array		Array of impression tracking URLs, expected to return a 1×1 image or 204 response - typically only passed when using 3rd party trackers. To be deprecated - replaced with eventtrackers.
jstracker	string		Optional JavaScript impression tracker. This is a valid HTML, Javascript is already wrapped in <script> tags. It should be executed at impression time where it can be supported. To be deprecated - replaced with eventtrackers.
eventtrackers	object array		Array of tracking objects to run with the ad, in response to the declared supported methods in the request. Replaces imptrackers and jstracker, to be deprecated.
privacy	string		If support was indicated in the request, URL of a page informing the user about the buyer's targeting activity.
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.

4.4.1 Object : Native Assets

Corresponds to the Asset Object in the request. The main container object for each asset requested or supported by Exchange on behalf of the rendering client. Any object that is required is to be flagged as such. Only one of the {title,img,video,data} objects should be present in each object. All others should be null/absent. The id is to be unique within the AssetObject array so that the response can be aligned.

Assets

Value	Type	Level	Description
id	integer		Optional if assetsurl/dcourl is being used; required if embedded asset is being used.
required	integer		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.

Value	Type	Level	Description
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	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

4.4.2 Object : Native Assets Title

Corresponds to the Title Object in the request, with the value filled in.
If using assetsurl or dcourl response rather than embedded asset response, it is recommended that three title objects be provided, the length of each of which is less than or equal to the three recommended maximum title lengths (25,90,140).

Title

Value	Type	Level	Description
text	string	required	The text associated with the text element.
len	integer		The length of the title being provided. Required if using assetsurl/dcourl representation, optional if using embedded asset representation.
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

4.4.3 Object : Native Assets Image

Corresponds to the Image Object in the request. The Image object to be used for all image elements of the Native ad such as Icons, Main Image, etc.
It is recommended that if assetsurl/dcourl is being used rather than embedded assets, that an image of each recommended aspect ratio (per the Image Types table) be provided for image type 3.

Image

Value	Type	Level	Description
type	integer		Required for assetsurl or dcourl responses, not required for embedded asset responses. The type of image element being submitted from the Image Asset Types table.
url	string	required	URL of the image asset.
w	integer	recommended	Width of the image in pixels. Recommended for embedded asset responses. Required for assetsurl/dcourlresponses if multiple assets of same type submitted.
h	integer	recommended	Height of the image in pixels. Recommended for embedded asset responses. Required for assetsurl/dcourl responses if multiple assets of same type submitted.
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

4.4.4 Object : Native Assets Data

Corresponds to the Data Object in the request, with the value filled in. The Data Object is to be used for all miscellaneous elements of the native unit such as Brand Name, Ratings, Review Count, Stars, Downloads, Price count etc. It is also generic for future native elements not contemplated at the time of the writing of this document.

Data

Value	Type	Level	Description

Value	Type	Level	Description
type	integer		Required for assetsurl/dcourl responses, not required for embedded asset responses. The type of data element being submitted from the Data Asset Types table.
len	integer		Required for assetsurl/dcourl responses, not required for embedded asset responses. The length of the data element being submitted. Where applicable, must comply with the recommended maximum lengths in the Data Asset Types table.
value	string	required	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

4.4.5 Object : Native Assets Video

Corresponds to the Video Object in the request, yet containing a value of a conforming VAST tag as a value.

Video

Value	Type	Level	Description
vasttag	string	required	vast xml.

4.4.6 Object : Native Link

Used for ‘call to action’ assets, or other links from the Native ad. This Object should be associated to its peer object in the parent Asset Object or as the master link in the top level Native Ad response object. When that peer object is activated (clicked) the action should take the user to the location of the link.

Link

Value	Type	Level	Description
url	string	required	Landing URL of the clickable link.
clicktrackers	string array		List of third-party tracker URLs to be fired on click of the URL.
fallback	string		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

4.4.7 Object : Event Trackers

The event trackers response is an array of objects and specifies the types of events the bidder wishes to track and the URLs/information to track them. Bidder must only respond with methods indicated as available in the request. Note that most javascript trackers expect to be loaded at impression time, so it’s not generally recommended for the buyer to respond with javascript trackers on other events, but the appropriateness of this is up to each buyer.

EventTrackers

Value	Type	Level	Description
event	integer	required	Type of event to track. See Event Types table.
method	integer	required	Type of tracking requested. See Event Tracking Methods table.
url	text(string)		The URL of the image or js. Required for image or js, optional for custom.
customdata	object (key:value pairs)		To be agreed individually with the exchange, an array of key:value objects for custom tracking, for example the account number of the DSP with a tracking company. IE {“accountnumber”:”123”}.

Value	Type	Level	Description
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

4.4.8 Object : Ext

Ext

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

4.5 Substitution Macros

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

- seatbid.bid.burl
- seatbid.bid.nurl
- seatbid.bid.adm

Macro

Macro	Description
${AUCTION_ID}	ID of the bid request; from BidRequest.id attribute.
${AUCTION_BID_ID}	ID of the bid; from BidResponse.bidid attribute.
${AUCTION_IMP_ID}	ID of the impression just won; from imp.id attribute.
${AUCTION_SEAT_ID}	ID of the bidder seat for whom the bid was made.
${AUCTION_AD_ID}	ID of the ad markup the bidder wishes to serve; from bid.adid attribute.
${AUCTION_PRICE}	Settlement price using the same currency and units as the bid.
${AUCTION_CURRENCY}	The currency used in the bid (explicit or implied); for confirmation only.
${CLICK_TRACKING_URL}	Click tracking url
${CLICK_TRACKING_URL_ENCODE}	Encoded click tracking url
${CLICK_TRACKING_URL_ENCODE_ENCODE}	Double-Encoded click tracking url
${US_PRIVACY}	Fill with the CCPA signal

5. Reference Lists/Enumerations

- Please refer to the material in the following link.
- OpenRTB 2.5 (Section 5)
- OpenRTB Native 1.2 (Section 7)

6. Bid Request/Response Samples

6.1 Banner Samples

```
Banner Request
{
   "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"
   },
   "bcat":[
      "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
   }
}
```

```
Banner Response
{
   "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 Native Samples


```
Native Request
{
   "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\":8
0,\"type\":1,\"wmin\":80},\"required\":1},{\"id\":2,\"img\":{\"h\":627,\"type\":3,\"w\":1200},\"required\":1},{\"data\":{\"len\":100,\"ty
pe\":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"
   }
}
```

```
Native Response
{
   "bidid":"abc1234",
   "cur":"USD",
   "id":"1234567890",
   "seatbid":[
      {
         "seat":"xyz12345",
         "bid":[
            {
               "id":"12345678",
               "adid":"314",
               "cat":[
                  "IAB3"
               ],
               "adm":"{\"native\":{\"link\":{\"url\":\"http:\/\/www.adserver.com\"},\"assets\":[{\"id\":1,\"title\":{\"text\":\"This is t
he title\"}},{\"id\":2,\"img\":{\"url\":\"http:\/\/ image1.cdn.com\/creatives\/8003cbe865a24282a47ce346ff271000\",\"h\":627,\"w\":1200}},
{\"id\":3,\"img\":{\"url\":\"http:\/\/ image1.cdn.com\/creatives\/a7b528d5c537426da5e42f418cc35e47\",\"h\":80,\"w\":80}},{\"data\":{\"val
ue\":\"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
            }
         ]
      }
   ]
}
```

6.3 Video Samples

```
Video Request
{
   "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,
      "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
   }
}
```

```
Video Response
{
   "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=${AUCTION_PRICE}",
               "adomain":[
                  "advertiserdomain.com"
               ]
```

```
            }
          ],
          "seat":"4"
        }
    ]
}
```

7. Implementation Notes

7.1 No Bid Signaling

- HTTP 204 “No Content” from the bidder (most economical in terms of bandwidth).

7.2 Impression Expiration

- 30 minutes

7.3 PMP & Direct Deals

- Please refer to the material in the following link.
- OpenRTB 2.5 (Section 7.3)

7.4 Skippability

- Please refer to the material in the following link.
- OpenRTB 2.5 (Section 7.4)

7.5 COPPA Regulation Flag

- Please refer to the material in the following link.
- OpenRTB 2.5 (Section 7.5)

7.6 User Synchronization

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

Parameter

Aa Name	Scope	Description
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
tpmn_expires	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 1×1 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 Supported Auction Types

- 1st-Price Auction
- 2nd-Price Auction

7.8 Cost Tracking, Win Notice

7.8.1 For SSP

- TPMN uses burl as a cost tracking method.
- Depending on the partner situation, if burl is not supported, TPMN will use the image beacon in the adm.

7.8.2 For DSP

- TPMN supports burl, nurl and adm as a cost tracking method.
- *If both burl and nurl are found in the bidresponse, the burl takes precedence.*

7.9 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

7.9.1 ${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.
```

7.9.2 ${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_ur
l parameter. This assumes that your.adserver.com unescapes the tpmn_click_url parameter.
```

7.9.3 ${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_ur
l parameter. This assumes that your.adserver.com unescapes the tpmn_click_url parameter.
```