



IMPROVE DIGITAL – OPENRTB API SPECIFICATION DOCUMENT

Version Open RTB 2.5 – Last modified: November 2022

November 2022	Deprecated wopv extension; added badv, js and metro fields; introduced VAST 4.1 support with protocols values 11 and 12; introduced support for the audio object; added content, data and related sub-objects; updated max time section.
March 2022	Added support for “r” parameter in user-matching invoked from DSP side.
August 2021	Deprecated video.ext.aspect_ratio; rephrased description for loss code 102; added loss code 1001; updated max length for external_user_id (from 50 to 100 characters); introduced support for SKAdNetwork; introduced support for the metric object; updated objects-list in the bid request; included VAST 4.0 in protocols table.
December 2020	Deprecated video.ext.skip; introduced skip, skipmin and skipafter in the video object; added city and region to the geo object; added support for ext.eids in the user object; modified some examples.
April 2020	Modified bidfloor description for deals; added bidfloor in the imp object; added ext.us_privacy for CCPA support.
December 2019	Added cid parameter; removed PHP example for the price encryption; included SupplyChain information; updated user matching endpoint; added ext.consented_providers_settings.consented_providers parameter; updated Native parameters to include version 1.2; included more details in the ext.wopv field description; introduced “Rewarded Advertising” with imp.ext.is_reWARDED_inventory and video.ext.rewarded parameters; added video.ext.videotype and video.ext.skip parameters; changed scope/description for adm, nurl and burl; included alpha-3 support in the country parameter; changed scope for the ext.advertiser parameter.
February 2019	Added description for native advertisement; rephrased the GDPR-related information in the User matching section; added lurl parameter; added wopv extension; renumbered tables.



May 2018	GDPR specifications: user and regulations objects were adjusted and also the User matching section.
March 2018	Added at parameter to bid and deal object
July 2017	Creation of new oRTB2.5 version

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INTRODUCTION

1.1 BIDDING OVERVIEW

With RTB bidding, the price is determined by a server side API call between the RTB bidder and Improve Digital. The ad tag provided by the RTB bidder is only called when the buyer is selected as the winning bidder for that impression. **All bids and wins are in USD.**

1.2 BIDDING API

The bidding API should be implemented by the RTB bidder and receives bid requests from Improve Digital. The RTB bidder can provide Improve Digital with several endpoint URL's depending on their server's location (Europe x2 endpoints, US EAST x1 endpoint, APAC x1 endpoint).



1.3 TRANSPORT

The base protocol between Improve Digital and the RTB bidder is HTTP. Specifically, HTTP POST is required for bid requests. All calls should return HTTP code 200 except for an empty bid response, which should return HTTP 204.

1.4 MAX TIME

Improve Digital should receive the bid response within the tmax value in terms of milliseconds from the moment the bid request leaves Improve Digital.

1.5 DATA FORMAT

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

BID REQUEST SPECIFICATION

2.1 BID REQUEST OBJECT

Field	Type	Description
id	String	Unique identifier of the bid request.
imp	Array of objects	See Imp Object
site	Object	See Site Object
app	Object	See App Object
at	Object	Auction type, where 1 = First Price, 2 = Second Price Plus.
device	Object	See Device Object
user	Object	See User Object
bcat	Array of strings	Blocked advertiser categories - see Table 5.1
badv	Array of strings	Block-list of advertisers by their domains.
source	Object	See Source Object



regs	Object	See Regulations Object
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2.2 SOURCE OBJECT

Field	Type	Description
fd	Integer	Entity responsible for the final impression sale decision, where 0 = exchange, 1 = upstream source.
tid	String	Transaction ID that must be common across all participants in this bid request (e.g., potentially multiple exchanges).
ext.hbtype	Integer	This extension defines the type of header bidding. A value of "1" means "client-side" header bidding. A value of "2" means "server-side" header bidding.
ext.schain	Object	When requested by the DSP, Improve Digital can send the SupplyChain object in the bid requests, including the required attributes as detailed at https://github.com/InteractiveAdvertisingBureau/openrtb/blob/master/supplychainobject.md

2.3 REGULATIONS OBJECT

Field	Type	Description
coppa	Integer	It refers to the United States Children's Online Privacy Protection Act ("COPPA"). A value of "1" means that the site is primarily viewed by children, while "0" means that it is not expected to be primarily viewed by children.
ext.gdpr	Integer	Signals whether or not the request is subject to GDPR regulations. Which is an optional integer that indicates: 0 = No 1 = Yes



		Under OpenRTB conventions for optional attributes, <u>omission indicates Unknown</u> .
ext.us_privacy	String	It is based on the IAB CCPA Compliance Framework for Publishers & Technology Companies and it is applicable to users based in California. If empty, it means that Improve Digital did not receive the privacy string or it was invalid.

2.4 IMPRESSION OBJECT

The "imp" object describes the impression being auctioned. The bidder must respond with the impid in the bid response.

Field	Type	Default	Description
id	String		Identifier of the impression.
metric	Object		See Metric object
banner	Object		See Banner object
video	Object		See Video Object
native	Object		See Native Object
pmp	Object		See PMP Object
tagid	String		Identifier for specific ad placement or ad tag that was used to initiate the auction.
secure	Integer	0	Flag to indicate whether the impression requires secure URL creative assets and markup. A value of "1" means that the impression requires secure assets. A value of "0" means that secure assets are not mandatory.
instl	Integer		A value of "1" means the ad is an interstitial or full screen. A value of "0" means the ad is non interstitial.
ext.is_rewarded_inventory	Boolean		Currently applicable to video placements only: "TRUE" means that the impression is for "Rewarded



			Advertising"; "FALSE" means that the impression is not for "Rewarded Advertising"; an absent field means that the value is unknown.
bidfloor	Float		Minimum CPM price of the impression expressed in USD (not always available).
ext.skadn	Object		When available/applicable, Improve Digital can send the SKAdNetwork object and related fields as detailed at https://github.com/InteractiveAdvertisingBureau/openrtb/blob/master/extensions/community_extensions/skadnetwork.md .

2.5 BANNER OBJECT

Field	Type	Description
format	Array of objects	See Format Object
w	Integer	Width of the first format available in the format object. (in pixels)
h	Integer	Height of the first format available in the format object. (in pixels)
pos	Integer	Ad position - see Table 5.3
battr	Array of integers	Blocked creative attributes - see Table 5.2 . If blank, assume all types are allowed.
expdir	Array of integers	Properties of the expandable ad - see Table 5.4 for expandable directions.
api	Array of integers	List of supported API frameworks for this impression – see Table 5.5 . If an API is not explicitly listed, it is assumed not to be supported.

2.6 VIDEO OBJECT

Field	Type	Default	Description
mimes	Array of strings		MIME types supported.
maxduration	Integer		Maximum video ad duration in seconds.



minduration	Integer		Minimum video ad duration in seconds.
protocols	Array of integers	2,3,5,6	Video bid response protocols - see Table 5.6 .
w	Integer		Width of the player in pixels.
h	Integer		Height of the player in pixels.
startdelay	Integer		Indicates the start delay in seconds for preroll, midroll or postroll - see Table 5.9
placement	Integer		Placement type for the impression. Refer to table Table 5.7 .
linearity	Integer	1	Indicates whether the ad impression is linear or can be any type. A value of "1" denotes Linear / Instream. A value of "2" denotes Non-Linear/Overlay (Improve Digital currently supports Linear Impressions only).
battr	Array of integers		Blocked creative attributes - see Table 5.2 . If blank, assume all types are allowed.
minbitrate	Integer		Minimum bit rate in Kbps. Exchange may set this dynamically, or universally across their set of publishers. Validation limit minimal bitrate > 0 and < 15,000, Min bitrate has to be one lower than maximum bitrate.
maxbitrate	Integer		Maximum bit rate in Kbps. Exchange may set this dynamically, or universally across their set of publishers. Validation limit maximal bitrate > 0 and < 20,000
playbackmethod	Array of integers		List of allowed playback methods. If blank, assume that all are allowed. See Table 5.8 for a list of possible values.
api	Array of Integers		List of supported API frameworks for this impression - see Table 5.5 . If an API is not explicitly listed, it is assumed not to be supported.
ext.rewarded	Integer		"1" means that the impression is for "Rewarded Advertising"; "0" means that the impression is not for "Rewarded Advertising"; an absent field means that the value is unknown.
ext.videotype	String		When the impression is for "Rewarded Advertising", this field is included in the



			bid request with value "rewarded". In all other cases, the field is not included in the bid request.
skip	Integer		Indicates if the player will allow the video to be skipped, where 0 = no, 1 = yes.
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.

2.7 AUDIO OBJECT

Field	Type	Default	Description
mimes	Array of strings		MIME types supported.
maxduration	Integer		Maximum audio ad duration in seconds.
minduration	Integer		Minimum audio ad duration in seconds.
protocols	Array of integers		Audio bid response protocols - see Table 5.6 .
startdelay	Integer		Indicates the start delay in seconds for preroll, midroll or postroll - see Table 5.9
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.
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.
batrr	Array of integers		Blocked creative attributes - see Table 5.2 . If blank, assume all types are allowed.
minbitrate	Integer		Minimum bit rate in Kbps.



maxbitrate	Integer		Maximum bit rate in Kbps.
delivery	Array of integers		Supported delivery methods (e.g., streaming, progressive)- see Table 5.21 . If none specified, assume all are supported.
api	Array of Integers		List of supported API frameworks for this impression - see Table 5.5 . If an API is not explicitly listed, it is assumed not to be supported.
maxseq	Integer		The maximum number of ads that can be played in an ad pod.
feed	Integer		Type of audio feed – see Table 5.22 .
stitched	Integer		Indicates if the ad is stitched with audio content or delivered independently, where 0 = no and 1 = yes.
nvol	Integer		Volume normalization mode – see Table 5.23 .

2.8 NATIVE OBJECT

This object represents a native type impression, supported through the [OpenRTB Dynamic Native Ads API version 1.1](#) and [version 1.2](#). Unless differently stated, each native-related field is supported in both versions.

Field	Type	Description
request	String	JSON-encoded request payload complying with the Native Ad Specification.
request_native	Object	Request payload complying with the Native Ad Specification.
ver	String	Version of the Dynamic Native Ads API in use.

2.9 NATIVE MARKUP REQUEST OBJECT

Field	Type	Description
context	Integer	The context in which the ad appears. See Table 5.14 for a list of supported context types. No default value.
contextsubtype	Integer	A more detailed context in which the ad appears. See Table 5.15 for a list of supported context subtypes. No default



		value.
plcmtype	Integer	The design/format/layout of the ad unit being offered. See Table 5.16 for a list of supported placement types. No default value.
assets	Array of objects	An array of Asset Objects. Any bid response must comply with the array of elements expressed in the bid request. The Asset Object's structure is the same as in the OpenRTB Native protocol.
privacy (v1.2 only)	Integer	Set to 1 when the native ad supports buyer-specific privacy notice. Set to 0 when the native ad doesn't support custom privacy links or if support is unknown.
eventtrackers (v1.2 only)	Array of objects	Specifies what type of event tracking is supported. See Event Trackers Request Object below.

2.10 EVENT TRACKERS REQUEST OBJECT

The event trackers object (v1.2 only) 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.

Field	Type	Description
event (v1.2 only)	Integer	Type of event available for tracking. See Table 5.19 . No default value.
methods (v1.2 only)	Array of integers	Array of the types of tracking integers available for the given event. See Table 5.20 . No default value.

2.11 FORMAT OBJECT

This object represents an allowed size (i.e., height and width combination) for a banner impression. These are typically used in an array where multiple sizes are permitted.

Field	Type	Description
w	Integer	Width in device independent pixels (DIPS).



h	Integer	Hight in device independent pixels (DIPS).
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2.12 PMP OBJECT

Field	Type	Description
deals	Array of objects	List of deals.
private_auction	Integer	A value of "1" indicates that only bids for the enumerated deals will be accepted. A value of "0" (or unspecified) indicates that open market bids are welcome as well.

2.13 DEAL OBJECT

Field	Type	Description
id	String	Unique identifier of the deal.
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.
bidfloor	Float	Minimum CPM price of the deal expressed in USD.
ext.page	String	url of the page to be associated to the buyer related to the deal, replacing at all levels (targeting, reporting, etc.) the value passed through site.page or app.storeurl.
wseat	Array of strings	ID of the bidder seat who is allowed to make the bid. Although it is an array, currently we do not allow multiple seats to bid on the same deal.

2.14 SITE OBJECT

Field	Type	Description
id	String	Site ID in Improve Digital – used for debugging purposes.



name	String	Site name. It is not always exposed by the publisher in the bid requests.
domain	String	Top-level domain of the site. It is not always exposed by the publisher in the bid requests.
cat	Array of strings	IAB content categories for the overall site - see Table 5.1
sectioncat	Array of strings	IAB content categories for the section - see Table 5.1
pagecat	Array of strings	IAB content categories for the page - see Table 5.1
page	String	URL of the page. It is always exposed in the bid requests.
publisher	Object	See Publisher Object
content	Object	Details about the content within the site – see Content Object .
keywords	String	List of keywords describing this site in a comma separated string.

2.15 APP OBJECT

Field	Type	Description
id	String	App ID in Improve Digital – used for debugging purposes.
name	String	App name in Improve Digital.
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	Top-level domain of the application.
storeurl	String	app store URL for an installed app.
cat	Array of strings	IAB content categories for the overall site - see Table 5.1
sectioncat	Array of strings	IAB content categories for the section - see Table 5.1



pagecat	Array of strings	IAB content categories for the page - see Table 5.1
publisher	Object	See Publisher Object
content	Object	Details about the content within the app – see Content Object .
keywords	String	List of keywords describing this app in a comma separated list.

2.16 PUBLISHER OBJECT

Field	Type	Description
id	String	Unique identifier of the Publisher.

2.17 CONTENT OBJECT

Field	Type	Description
id	String	ID uniquely identifying the content.
episode	Integer	Episode number.
title	String	Content title.
series	String	Content series.
season	String	Content season.
artist	String	Artist credited with the content.
genre	String	Genre that best describes the content.
album	String	Album to which the content belongs; typically for audio.
isrc	String	International Standard Recording Code conforming to ISO-3901.
producer	Object	Content producer – see Producer Object .
url	String	URL of the content, for buy-side contextualization or review.
cat	Array of strings	Array of IAB content categories that describe the content producer – see Table 5.1
prodq	Integer	Production quality – see Table 5.24
context	Integer	Type of content – see Table 5.25



contentrating	String	Content rating.
userrating	String	User rating.
qagmediarating	Integer	Media rating per IQG guidelines – see Table 5.26
keywords	String	Comma separated list of keywords describing the content.
livestream	Integer	0 = not live, 1 = content is live.
sourcerelationship	Integer	0 = indirect, 1 = direct.
len	Integer	Length of content in seconds.
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 and 1 = yes.
data	Array of objects	Additional content data. Each Data object represents a different data source – see Data Object .

2.18 PRODUCER OBJECT

Field	Type	Description
id	String	Content producer or originator ID.
name	String	Content producer or originator name.
cat	Array of strings	Array of IAB content categories that describe the content producer – see Table 5.1
domain	String	Highest level domain of the content producer

2.19 DEVICE OBJECT

Field	Type	Description
ua	String	Browser user agent.
geo	Object	See Geo Object



dnt	Integer	Do not track – value “0” means that do not track is set to false in the browser, while value “1” means that do not track is set to true.
lmt	Integer	“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	IPv4 address closest to the device.
devicetype	Integer	Device Type - see Table 5.11
make	String	Device Make.
model	String	Device Model.
os	String	Device operating system.
osv	String	Device operating system version.
h	Integer	Physical height of the screen in pixels.
w	Integer	Physical Width of the screen in pixels.
language	String	Browser language.
js	Integer	Support for JavaScript, where 0 = no and 1 = yes.
carrier	String	http://en.wikipedia.org/wiki/Mobile_network_code
connectiontype	integer	Network connection type. Refer to Table 5.12 .
ifa	String	Native identifier for advertisers: an opaque ID assigned by the device or browser for use as an advertising identifier (e.g. Apple's IFA, Android's Advertising ID, etc).
didsha1	String	SHA1 hashed device ID.
didmd5	String	MD5 hashed device ID.
dpidsha1	String	SHA1 hashed platform-specific ID (e.g., Android ID or UDID for iOS).
dpidmd5	String	MD5 hashed platform-specific ID (e.g., Android ID or UDID for iOS). It should be interpreted as case insensitive.



2.20 GEO OBJECT

Field	Type	Description
lon	Float	Longitude from -180 to 180. West is negative.
lat	Float	Latitude from -90 to 90. South is negative.
type	Integer	Indicate the source of the geo data - see Table 5.10 for a list of possible values. Type should be provided when lat/lon is provided.
country	String	Country based on IP look up. The default format is ISO 3166-1 alpha 2 (http://en.wikipedia.org/wiki/ISO_3166-1_alpha-2), with alpha 3 supported on request.
region	String	Region code using ISO-3166-2; 2-letter state code if USA.
metro	String	Google metro code.
city	String	City using United Nations Code for Trade & Transport Locations.

2.21 USER OBJECT

Field	Type	Description
id	String	Publisher user id.
buyerid	String	External user id.
ext.eids	Object	Extended (third-party) identifiers for the user, with support for ext.eids.source and ext.eids.uids.id, following the IAB specs .
ext.consent	String	Contains the consent string (daisy bit). The user consent string is optional, but highly recommended if the request is subject to GDPR regulations (i.e., <code>Regs.ext.gdpr = 1</code>). The default sense of consent under GDPR is "opt-out" and as such, an omitted consent string in a request subject to GDPR would need to be interpreted as equivalent to the user fully opting out of all defined purposes for data use by all parties.
ext.improve_consent	Integer	The extension attribute "improve_consent", integer, which is an



		Improve specific extension containing Improve Consent values found in table 5.13
ext.consented_providers_settings.consented_providers	Array of Integers	When requested/supported by the DSP, Improve Digital can send, in bid requests related to Google's Exchange Bidding in Dynamic Allocation (EBDA), Google's dynamic list of consented providers.
data	Array of objects	Additional user data. Each Data object represents a different data source – see Data Object .

2.22 DATA OBJECT

Field	Type	Description
id	String	Exchange-specific ID for the data provider.
name	String	Exchange-specific name for the data provider.
segment	Array of objects	Array of segment objects that contain the actual data values – see Segment Object .

2.23 SEGMENT OBJECT

Field	Type	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.

2.24 METRIC OBJECT

Field	Type	Description
type	String	Type of metric being presented using



		exchange curated string names.
value	Float	Number representing the value of the metric, with probabilities in the range 0.0 – 1.0.
vendor	String	Source of the value using exchange curated string names.

2.25 BID REQUEST EXAMPLES

2.25.1 COMPLETE EXAMPLE (BANNER with GDPR consent)

```

{
  "source": {
    "ext": {
      "schain": {
        "ver": "1.0",
        "nodes": [
          {
            "asi": "advertisingsystem.net",
            "rid": "00000000-0000-0000-0000-000000000000",
            "hp": 1,
            "sid": "0000"
          },
          {
            "rid": "00000000-0000-0000-0000-000000000000",
            "hp": 1,
            "asi": "improvedigital.com",
            "sid": "986"
          }
        ],
        "complete": 1
      }
    },
    "fd": 0,
    "tid": "000000000000000000"
  },
  "user": {
    "id": "00000000-0000-0000-0000-000000000000",
    "ext": {
      "eids": [
        {
          "source": "liveramp.com",
          "uids": [
            {
              "id": "11111111"
            }
          ]
        }
      ],
      "improve_consent": 1,
      "consent": "BORC-NgORC-NgAPABAENBT-
AAAAel7_____9_____9uz_Gv_v_f_33e8_9v_l_7_-_u_-33d4-_1vX99yfm1-7fr1tp386ues2LDqKQ"
    }
  }
}

```



```
},
"id": "00000000-0000-0000-0000-000000000000",
"device": {
  "ip": "00.00.000.00",
  "geo": {
    "type": 2,
    "city": "SampleCity",
    "country": "NL",
    "region": "SampleRegion"
  },
  "os": "OSX",
  "model": "Mac",
  "osv": "OSX_10.13",
  "carrier": "SampleCarrier",
  "devicetype": 2,
  "connectiontype": 0,
  "dnt": 0,
  "make": "Apple",
  "ua": "Mozilla/5.0 (Macintosh; Intel Mac OS X 10_13_0) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/00.0.0000.000 Safari/000.000",
  "language": "nl"
},
"tmax": 120,
"at": 1,
"site": {
  "id": "123456",
  "domain": "SampleDomain",
  "page": "SampleSitePage",
  "publisher": {
    "id": "671"
  },
  "name": "SampleSiteName"
},
"regs": {
  "coppa": 0,
  "ext": {
    "gdpr": 1
  }
},
"imp": [{
  "tagid": "12345678",
  "ext": {},
  "id": "1",
  "banner": {
    "h": 600,
    "format": [{
      "w": 300,
      "h": 600
    }, {
      "w": 336,
      "h": 280
    }
  ]
}
```



```
    }, {
      "w": 300,
      "h": 250
    }],
    "w": 300,
    "pos": 0
  },
  "secure": 0,
  "bidfloor": 0.5,
  "instl": 0
}
}
```

2.25.2 VIDEO OBJECT EXAMPLE

```
"video":{
  "skip":1,
  "skipmin":30,
  "placement":1,
  "w":400,
  "skipafter":5,
  "maxduration":20,
  "protocols":[2,5],
  "minduration":5,
  "h":300,
  "startdelay":0,
  "mimes":["video/mpeg","video/mp4","video/quicktime","video/x-ms-wmv","video/x-flv"],
  "linearity":1,
  "pos":0
}
```

2.25.3 APP OBJECT EXAMPLE

```
{
  "app":{
    "domain":"http://improvedigital.com/",
    "id":"121487",
    "storeurl":"http://www.improvedigital.com/storeexample",
    "sectioncat":["IAB1-6"],
    "pagecat":["IAB3-10","IAB3-5"],
    "publisher":{"id":"671"},
    "bundle":"TestBUNDLE",
    "cat":["IAB1"],
    "name":"inApp Test Site"
  }
}
```



2.25.4 NATIVE OBJECT EXAMPLE

Example showing the native object in native version 1.1 and without the use of the JSON-encoded string

```
"native":{
  "request_native":{
    "assets":[
      {
        "data":{
          "type":2,
          "len":512
        },
        "id":16,
        "required":1
      },
      {
        "data":{
          "type":1,
          "len":256
        },
        "id":14,
        "required":1
      },
      {
        "title":{
          "len":100
        },
        "id":13,
        "required":1
      },
      {
        "id":15,
        "img":{
          "hmin":200,
          "wmin":350,
          "type":3
        },
        "required":1
      }
    ],
    "context":1,
    "ver":"1.1",
    "plcmntype":2
  },
  "ver":"1.1"
}
```



BID RESPONSE SPECIFICATION

3.1 OBJECT LIST

Object		Description
BidResponse		Top-level object.
seatbid		Collection of bids made by the bidder on behalf of a specific seat.
bid		An offer to buy a specific impression under certain business terms.

3.2 BID RESPONSE OBJECT

Field	Scope	Type	Description
id	Required	String	ID of the bid request.
seatbid	Required	Array of objects	At least one seat bid object is required in a bid seat.

3.3 SEAT BID OBJECT

Field	Scope	Type	Description
bid	Required	Array of objects	Array of bid objects.
seat	Optional	String	ID of the bidder seat who is making the bid (mandatory when bidding on deals).



3.4 BID OBJECT

Field	Scope	Type	Description
id	Required	String	Identifier chosen by the RTB bidder.
impid	Required	String	ID of the impression object the bid applies to.
price	Required	Float	Bid price in US dollar (\$) CPM.
burl	Optional	String	Billing notice URL called by the exchange when a winning bid becomes billable based on exchange-specific business policy. If used, it must contain the win price macro (see win notification).
nurl	Optional	String	It is supported for VAST bids only, as an alternative of the "adm" field to return the VAST XML. If "adm" is used in the response, the "nurl" will be discarded. If "nurl" is used in the response, it should include the win price macro unless the "burl" is used (in which case the win price macro should be passed in the "burl").
lurl	Optional	String	Loss notice URL called by the exchange when a bid is known to have been lost. The supported macros are listed in table 5.17 , while the loss notification codes are in table 5.18 .
adm	Required for Display and inApp bids	String	Actual ad markup in case the bid wins. If the "burl" parameter is not supported by the DSP, it should include the win price macro. For native bids, the native creative can be returned as a JSON-encoded string (or via the adm_native field)
adm_native	Optional	Object	See Native Parameters



adomain	Required	Array of strings	List of top-level domains for advertiser to be used in blacklisting.
cid	Optional	String	Campaign ID.
crld	Required	String	Creative ID.
cat	Optional	Array of string	IAB content categories of the creative. Refer to Table 5.1 . Required if bcat is sent in the bid request.
attr	Optional	Array of integers	Set of attributes describing the creative. Refer to Table 5.2 . Required if banner.battr is sent in the bid request.
api	Optional	Integer	API required by the markup if applicable. Refer to Table 5.5 .
protocol	Required for VAST bids	Integer	Video response protocol of the markup if applicable. Refer to Table 5.6 .
dealid	Optional	String	Indicates that the bid belongs to the deal object. Required for PMP deals.
w	Required	Integer	Width of the creative in device independent pixels (DIPS).
h	Required	Integer	Hight of the creative in device independent pixels (DIPS).
ext.advertiser	Optional	String	Name of the advertiser placing the bid.
ext.skadn	Optional	Object	If the bid request includes the BidRequest.imp.ext.skadn object, the DSP can choose to add this object to the bid response, indicating which SKAdNetwork it wishes to use, as detailed at https://github.com/InteractiveAdvertisingBureau/openrtb/blob/master/extensions/community_extensions/skadnetwork.md



3.5 NATIVE PARAMETERS

Field	Type	Description
ver	Integer	Version of the Native Markup version in use. Examples: '1.1', '1.2'.
assets	Array of objects	List of native assets
link	Object	Destination Link. This is default link object for the ad. Individual assets can also have a link object which applies if the asset is activated(clicked). If the asset doesn't have a link object, the parent link object applies.
imtrackers (v1.1 only)	Array of strings	List of tracking urls that should be triggered (can be empty).
jstracker (v1.1 only)	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.
privacy (v1.2 only)	String	If support was indicated in the request, URL of a page informing the user about the buyer's targeting activity.
eventtrackers (v1.2 only)	Array of objects	Array of tracking objects to run with the ad, in response to the declared supported methods in the request. See Event Tracker Object below.

3.5.1 EVENT TRACKERS RESPONSE OBJECT

The event trackers response (version 1.2 only) is an array of objects and specifies the types of events the bidder wishes to track and the URLs/information to track them.

Field	Type	Description
event (v1.2 only)	Integer	Type of event available for tracking. See Table 5.19 .



methods (v1.2 only)	Array of integers	Array of the types of tracking integers available for the given event. See Table 5.20 .
url (v.1.2 only)	String	The URL of the image or js. Required for image or js, optional for custom.

3.6 BID RESPONSE EXAMPLES

3.6.1 BANNER

```
{
  "id": "1a46691f-7c94-490d-9cbf-47af9c8470fd",
  "seatbid": [
    {
      "bid": [
        {
          "burl": "http://billingurl.com/win_notice&p=${AUCTION_PRICE}"
          "adm": "<a href=\"[click_url]http://anyURL\"><img style=\"border: 0; width=\"90\"
height=\"728\" src=\"http://anyImagePath\" alt=\"\"/></a><img width=\"1\" height=\"1\" border=\"0\"
alt=\"\" src=\"http://anyImagePath\"/>",
          "adomain": [ "anySampleDomain.com" ],
          "dealid": "204508",
          "h": 90,
          "w": 728,
          "ext": {
            "advertiser": "AdvertiserABC"
          },
          "id": "1",
          "impid": "2",
          "price": 5,
          "criid": "123abc",
          "attr": [3],
          "cat": ["1AB1-3"]
        }
      ],
      "seat": "1234"
    }
  ]
}
```

3.6.2 VIDEO

```
{
  "id": "f9ffdf5b-0733-4136-9146-fe7f9b88b14c",
  "seatbid": [
    {
      "bid": [
```



```
{
  "adomain": [ "anySampleDomain1.com", "anySampleDomain2.com" ],
  "ext": {
    "advertiser": "AdvertiserXYZ"
  },
  "crid": "123abc",
  "api": 2,
  "protocol": 3,
  "h": 3,
  "w": 4,
  "id": "1",
  "impid": "1",
  "adm": "http://vast_url.com/vast_path",
  "burl": "http://billingurl.com/win_notice&p=${AUCTION_PRICE}"
  "price": 5
}
],
"seat": "10"
}
]
```

3.6.3 APP

```
{
  "id": "8c5430d9-2747-476e-90d3-a04c690beced",
  "seatbid": [
    {
      "bid": [
        {
          "adm": "<a href=\"[click_url]http://anyURL\"><img style=\"border: 0;\" width=\"50\"
height=\"300\" src=\"http://anyImagePath\" alt=\"\"/></a><img width=\"1\" height=\"1\" border=\"0\"
alt=\"\" src=\"http://anyImagePath.com\"/>",
          "burl": "http://billingurl.com/win_notice&p=${AUCTION_PRICE}"
          "adomain": [ "anySampleDomain.com" ],
          "ext": {
            "advertiser": "SampleAdvertiser"
          },
          "id": "1",
          "crid": "123abc",
          "impid": "2",
          "price": 4
          "h": 50,
          "w": 300,
        }
      ],
      "seat": "buyer4199"
    }
  ]
}
```



3.6.4 NATIVE

Example with version 1.1 and without the JSON-encoded string

```
{
  "seatbid":[
    {
      "bid":[
        {
          "ext":{
            "advertiser_name":"AdvertiserXYZ"
          },
          "price":4.6493,
          "adm_native":{
            "link":{
              "clicktrackers":[
                "http://anyExample/..."
              ],
              "url":"anyOtherExample/..."
            },
            "jstracker":"<script src="          http:          ..."></script>",
            "imptrackers":[
              "http://anyExample/imp/${AUCTION_PRICE}/...",
              "http://anyExample/native_tracker/imptracker/..."
            ],
            "assets":[
              {
                "data":{
                  "value":"Example"
                },
                "id":14
              },
              {
                "data":{
                  "value":"Sample offer"
                },
                "id":16
              },
              {
                "img":{
                  "w":600,
                  "url":"http://anyExample/600x350.png",
                  "h":350
                },
                "id":15
              },
              {
                "title":{
                  "text":"Join the sample offer"
                },
                "id":13
              }
            ]
          }
        }
      ]
    }
  ]
}
```



```

    }
  ],
  "ver":"1.1"
},
"iurl":"http://anyExample/preview?creative_id=2015",
"adomain":[
  "anyExample"
],
"burl":"anyExample?rid=...&p=${AUCTION_PRICE}&aid=",
"clid":"8_2015",
"impid":"1"
}
],
"seat":"8"
}
],
"cur":"USD",
"id":"..."
}

```

3.7 WIN NOTIFICATION AND MACROS

Improve Digital will notify the RTB bidder with feedback on the results of each won impression. If the RTB bidder wins the auction and the creative is served, the notification will be provided as a macro on the winning ad tag. We support the below macros:

Macro	Required	Description
<code>\${AUCTION_PRICE}</code>	Yes	The winning price for the impression, \$ CPM.
<code>\${AUCTION_PRICE:B64}</code>	No, but highly recommended	The winning price for the impression, encrypted, \$ CPM. See below.
<code>[click_url]</code>	Yes	Used to register the click with Improve Digital *
<code>[click_url_enc]</code>	Yes	The URL-encoded version of <code>click_url</code> , which can be used to first pass the value through another server that will return a redirect *



Click macro examples:

```
<a href="[click_url]http%3A%2F%2Fadserver.com%2Fhandleclick%3Fclick%3Dclk"></a>
```

```
<a href="http://adserver.com/click?redirect_url=[click_url_enc]"></a>
```

3.8 PRICE ENCRYPTION

The RTB bidder decryption code should decrypt the price using the encryption key and verify the integrity bits with the integrity key.

The keys will be provided offline by the RTB bidder to Improve Digital, as part of the account setup process.

Example:

Encoding Key: *c422fdd0d81f*

Integrity Key: *fe3fd7dd8731*

The RTB bidder should include one of the following win notification macros in the creative sent with the bid:

Macro	Description
[publisher_win_price_encrypted]	
\${AUCTION_PRICE:Base64}	The winning price for the impression in Base64 encoding, \$ CPM.
\${AUCTION_PRICE:GPD}	The winning price for the impression, encrypted, \$ CPM. Encryption is based on the <i>Google Private Data Encryption</i> protocol - documentation can be found here : https://developers.google.com/ad-exchange/rtb/response-guide/decrypt-price



USER MATCHING

4.1 USER MATCHING API AND PARAMETERS

User Matching is an essential component of RTB, which allows the RTB bidders to identify their users on the Improve Digital platform (360 yield platform) with their own user IDs. Through a pixel API, the rtb bidder can store the User ID on the 360 yield platform. Improve Digital will then pass the user ID in the bid request.

When Improve Digital recognizes that the RTB bidder will receive a request for a user that has not yet been matched, it will generate a pixel request that piggybacks on the creative of another ad being served. The request will include a callback URL that the RTB bidder should then call in response.

The API is called as an HTTP request that returns a 301 HTTP redirect to the Improve Digital's 360 Platform.

Secure and non-secure bidder URLs can be supported for piggybacking on SSL and non-SSL pages. The RTB bidder should provide Improve Digital with both URLs.

The RTB bidder should implement an API that accepts the following parameters on the GET request of the pixel used for user matching:

Parameter	Description
publisher_user_id	Improve Digital's unique identifier of the user.
publisher_dsp_id	Improve Digital's unique identifier of the RTB bidder.
publisher_redirecturl	URL to call back to Improve Digital.
publisher_call_type	It indicates the type of response expected by Improve Digital. It could be js, iframe or redirect. Type js means that the matching call to a bidder is placed inside a JavaScript creative, iframe means that it is placed inside an iframe, and redirect means that it is placed inside an image tag. When it is blank, js is assumed.



gdpr	GDPR specific parameter where 1 means the request is subjected to GDPR regulation. If the parameter is omitted, the request is not subjected to GDPR regulation.
gdpr_consent	URL-safe base64-encoded GDPR consent string. Only meaningful if gdpr=1.

User-matching GDPR specifications for Improve Digital initiated calls:

Upon receiving the consent string, Improve Digital will parse it and, if the request is subjected to GDPR regulation and consent is given to Improve Digital, then the match request initiated by improve Digital will contain the following parameters:

```
&gdpr=1  
&gdpr_consent={IAB_consent_string}
```

where IAB_consent_string is the URL-safe base64-encoded GDPR consent string. Only meaningful if gdpr=1.

Example:

```
http://[BIDDER_MATCHING_URL]?publisher_user_id=1234&publisher_dsp_id=12&publis  
her_call_type=redirect&gdpr=1&gdpr_consent=  
BOEFBi5OEFBi5AHABDENAI4AAAB9vABAASA&publisher_redirecturl=http://match.360yi  
eld.com/match
```

When the RTB bidder receives a user match request, a callback URL to the Improve Digital's 360 platform should be generated.

Alternatively, the RTB bidder can initiate a call to Improve Digital's 360 platform (<http://match.360yield.com/match>) with the same parameters (plus dsp_callback=1). In this case, the publisher_dsp_id identifier is provided by Improve Digital to the RTB bidder offline.



User-matching GDPR specifications for bidder initiated calls:

Improve Digital will check whether user is a GDPR subject for all Matching requests.

- If user is not a GDPR subject, then nothing changes and match can be processed;
- If user is a GDPR subject, Improve Digital expects `gdpr=1` and checks then the `gdpr_consent`:
 - if Improve Digital has consent, then match can be processed
 - if Improve Digital doesn't have consent, then match cannot be processed.

Improve Digital supports the following parameters:

Parameter	Required	Description
<code>publisher_dsp_id</code>	Yes	Improve Digital's unique identifier of the RTB bidder.
<code>external_user_id</code>	Yes	RTB bidder's unique identifier of the user. If you set it to "0", you will disable the user matching for this user. Please note that the <code>external_user_id</code> is limited to max 100 characters.
<code>dsp_callback</code>	No, but highly recommended	By adding <code>dsp_callback=1</code> we will identify a matching request initiated by you.
Expiration	No	Expiration date for user match in unix time (seconds) in EST timezone. If omitted or "0", there is no expiration. Expiration cannot be longer than 3 months from current time
<code>gdpr</code>	yes for requests subjected to GDPR	GDPR specific parameter where 0 means the request is not subjected to GDPR regulation and 1 means the request is subjected to GDPR regulation.
<code>gdpr_consent</code>	yes for requests subjected to GDPR	URL-safe base64-encoded GDPR consent string. Only meaningful if <code>gdpr=1</code> .
<code>r</code>	No	In user-matching invoked from DSP side, it is the redirect Improve will use to redirect back to the DSP after being asked for an Improve User ID (supported with <code>{PUB_USER_ID}</code> macro) - please ensure "r" is the last parameter in the request to



		Improve, it is encoded and has http(s) prefix.
--	--	--

RTB bidder's user example match response:

http://match.360yield.com/match?publisher_dsp_id=12&external_user_id=ABCD

ENUMERATED LISTS SPECIFICATION

5.1 CONTENT CATEGORIES

List of supported categories. Where the primary category value is passed, all secondary values for that category are assumed to be included as well. Example: IAB1 is sent in the request for bcat – all values IAB1-1, IAB1-2, etc. should be blocked.

Value	Description
IAB1	Arts & Entertainment
IAB1-1	Books & Literature
IAB1-2	Celebrity Fan/Gossip
IAB1-3	Fine Art
IAB1-4	Humor
IAB1-5	Movies
IAB1-6	Music
IAB1-7	Television
IAB2	Automotive
IAB2-1	Auto Parts
IAB2-2	Auto Repair
IAB2-3	Buying/Selling Cars
IAB2-4	Car Culture
IAB2-5	Certified Pre-Owned
IAB2-6	Convertible
IAB2-7	Coupe
IAB2-8	Crossover
IAB2-9	Diesel
IAB2-10	Electric Vehicle
IAB2-11	Hatchback
IAB2-12	Hybrid
IAB2-13	Luxury
IAB2-14	MiniVan
IAB2-15	Motorcycles
IAB2-16	Off Road Vehicles
IAB2-17	Performance Vehicles
IAB2-18	Pickup



IAB2-19	Roadside Assistance
IAB2-20	Sedan
IAB2-21	Trucks & Accessories
IAB2-22	Vintage Cars
IAB2-23	Wagon
IAB3	Business
IAB3-1	Advertising
IAB3-2	Agriculture
IAB3-3	Biotech/Biomedical
IAB3-4	Business Software
IAB3-5	Construction
IAB3-6	Forestry
IAB3-7	Government
IAB3-8	Green Solutions
IAB3-9	Human Resources
IAB3-10	Logistics
IAB3-11	Marketing
IAB3-12	Metals
IAB4	Careers
IAB4-1	Career Planning
IAB4-2	College
IAB4-3	Financial Aid
IAB4-4	Jobs Fairs
IAB4-5	Job Search
IAB4-6	Resume Writing
IAB4-7	Nursing
IAB4-8	Scholarships
IAB4-9	Telecommuting
IAB4-10	Military
IAB4-11	Career Advice
IAB5	Education
IAB5-1	7-12 Education
IAB5-2	Adult Education
IAB5-3	Art History
IAB5-4	College Administration
IAB5-5	College Life
IAB5-6	Distance Learning
IAB5-7	English as a 2 nd Language
IAB5-8	Language Learning
IAB5-9	Graduate School
IAB5-10	Homeschooling
IAB5-11	Homework/Study Tips
IAB5-12	k-6 Educators
IAB5-13	Private School



IAB5-14	Special Education
IAB5-15	Studying Business
IAB6	Family & Parenting
IAB6-1	Adoption
IAB6-2	Babies & Toddlers
IAB6-3	Daycare/Pre School
IAB6-4	Family Internet
IAB6-5	Parenting K-6 Kids
IAB6-6	Parenting Teens
IAB6-7	Pregnancy
IAB6-8	Special Needs Kids
IAB6-9	Eldercare
IAB7	Health & Fitness
IAB7-1	Exercise
IAB7-2	A.D.D
IAB7-3	AIDS/HIV
IAB7-4	Allergies
IAB7-5	Alternative Medicine
IAB7-6	Arthritis
IAB7-7	Asthma
IAB7-8	Autism/PDD
IAB7-9	Bipolar Disorder
IAB7-10	Brain Tumour
IAB7-11	Cancer
IAB7-12	Cholesterol
IAB7-13	Chronic Fatigue Syndrome
IAB7-14	Chronic Pain
IAB7-15	Cold & Flu
IAB7-16	Deafness
IAB7-17	Dental Care
IAB7-18	Depression
IAB7-19	Dermatology
IAB7-20	Diabetes
IAB7-21	Epilepsy
IAB7-22	GERD/Acid Reflux
IAB7-23	Headaches/Migraines
IAB7-24	Heart Disease
IAB7-25	Herbs for Health
IAB7-26	Holistic Healing
IAB7-27	IBS/Cohn's Disease
IAB7-28	Incest Abuse Support
IAB7-29	Incontinence
IAB7-30	Infertility
IAB7-31	Men's Health



IAB7-32	Nutrition
IAB7-33	Orthopaedics
IAB7-34	Panic/Anxiety Disorders
IAB7-35	Paediatrics
IAB7-36	Physical Therapy
IAB7-37	Psychology/Psychiatry
IAB7-38	Senior Health
IAB7-39	Sexuality
IAB7-40	Sleep Disorders
IAB7-41	Smoking Cessation
IAB7-42	Substance Abuse
IAB7-43	Thyroid Disease
IAB7-44	Weight Loss
IAB7-45	Women's Health
IAB8	Food and Drink
IAB8-1	American Cuisine
IAB8-2	Barbecues & Grilling
IAB8-3	Cajun/Creole
IAB8-4	Chinese Cuisine
IAB8-5	Cocktails/Beer
IAB8-6	Coffee/Tea
IAB8-7	Cuisine-Specific
IAB8-8	Desserts & Baking
IAB8-9	Dining Out
IAB8-10	Food Allergies
IAB8-11	French Cuisine
IAB8-12	Health/Lowfat Cooking
IAB8-13	Italian Cuisine
IAB8-14	Japanese Cuisine
IAB8-15	Mexican Cuisine
IAB8-16	Vegan
IAB8-17	Vegetarian
IAB8-18	Wine
IAB9	Hobbies & Interests
IAB9-1	Art/Technology
IAB9-2	Arts & Crafts
IAB9-3	Beadwork
IAB9-4	Birdwatching
IAB9-5	Board Games and Puzzles
IAB9-6	Candle & Soap Making
IAB9-7	Card Games
IAB9-8	Chess
IAB9-9	Cigars
IAB9-10	Collecting



IAB9-11	Comic Books
IAB9-12	Drawing & Sketching
IAB9-13	Freelance Writing
IAB9-14	Genealogy
IAB9-15	Getting Published
IAB9-16	Guitar
IAB9-17	Home Recording
IAB9-18	Investors & Patents
IAB9-19	Jewellery Making
IAB9-20	Magic & Illusion
IAB9-21	Needlework
IAB9-22	Painting
IAB9-23	Photography
IAB9-24	Radio
IAB9-25	Roleplaying Games
IAB9-26	Sci-Fi & Fantasy
IAB9-27	Scrapbooking
IAB9-28	Screenwriting
IAB9-29	Stamps & Coins
IAB9-30	Video & Computer Games
IAB9-31	Woodworking
IAB10	Home & Garden
IAB10-1	Appliances
IAB10-2	Entertaining
IAB10-3	Environmental Safety
IAB10-4	Gardening
IAB10-5	Home Repair
IAB10-6	Home Theatre
IAB10-7	Interior Decorating
IAB10-8	Landscaping
IAB10-9	Remodelling & Construction
IAB11	Law, Government & Politics
IAB11-1	Immigration
IAB11-2	Legal Issues
IAB11-3	U.S. Governmental Resources
IAB11-4	Politics
IAB11-5	Commentary
IAB12	News
IAB12-1	International News
IAB12-2	National News
IAB12-3	Local News
IAB13	Personal Finance
IAB13-1	Beginning Investing
IAB13-2	Credit/Debt & Loans



IAB13-3	Financial News
IAB13-4	Financial Planning
IAB13-5	Hedge Fund
IAB13-6	Insurance
IAB13-7	Investing
IAB13-8	Mutual Funds
IAB13-9	Options
IAB13-10	Retirement Planning
IAB13-11	Stocks
IAB13-12	Tax Planning
IAB14	Society
IAB14-1	Dating
IAB14-2	Divorce Support
IAB14-3	Gay Life
IAB14-4	Marriage
IAB14-5	Senior Living
IAB14-6	Teens
IAB14-7	Weddings
IAB14-8	Ethnic Specific
IAB15	Science
IAB15-1	Astrology
IAB15-2	Biology
IAB15-3	Chemistry
IAB15-4	Geology
IAB15-5	Paranormal Phenomena
IAB15-6	Physics
IAB15-7	Space/Astronomy
IAB15-8	Geography
IAB15-9	Botany
IAB15-10	Weather
IAB16	Pets
IAB16-1	Aquariums
IAB16-2	Birds
IAB16-3	Cats
IAB16-4	Dogs
IAB16-5	Large Animals
IAB16-6	Reptiles
IAB16-7	Veterinary Medicine
IAB17	Sports
IAB17-1	Auto-Racing
IAB17-2	Baseball
IAB17-3	Bicycling
IAB17-4	Bodybuilding
IAB17-5	Boxing



IAB17-6	Canoeing/Kayaking
IAB17-7	Cheerleading
IAB17-8	Climbing
IAB17-9	Cricket
IAB17-10	Figure Skating
IAB17-11	Fly Fishing
IAB17-12	Football
IAB17-13	Freshwater Fishing
IAB17-14	Game & Fish
IAB17-15	Golf
IAB17-16	Horse Racing
IAB17-17	Horses
IAB17-18	Hunting & Shooting
IAB17-19	Inline Skating
IAB17-20	Martial Arts
IAB17-21	Mountain Biking
IAB17-22	NASCAR
IAB17-23	Olympics
IAB17-24	Paintball
IAB17-25	Power & Motorcycles
IAB17-26	Pro Basketball
IAB17-27	Pro Ice Hockey
IAB17-28	Rodeo
IAB17-29	Rugby
IAB17-30	Running / Jogging
IAB17-31	Sailing
IAB17-32	Saltwater Fishing
IAB17-33	Scuba Diving
IAB17-34	Skateboarding
IAB17-35	Skiing
IAB17-36	Snowboarding
IAB17-37	Surfing / Bodyboarding
IAB17-38	Swimming
IAB17-39	Table Tennis/Ping-Pong
IAB17-40	Tennis
IAB17-41	Volleyball
IAB17-42	Walking
IAB17-43	Water-skiing / Wakeboarding
IAB17-44	World Soccer
IAB18	Style & Fashion
IAB18-1	Beauty
IAB18-2	Body Art
IAB18-3	Fashion
IAB18-4	Jewellery



IAB18-5	Clothing
IAB18-6	Accessories
IAB19	Technology & Gaming
IAB19-1	3-D Graphics
IAB19-2	Animation
IAB19-3	Anitvirus Software
IAB19-4	c/c++
IAB19-5	Cameras & Camcorders
IAB19-6	Cell Phones
IAB19-7	Computer Certification
IAB19-8	Computer Networking
IAB19-9	Computer Peripherals
IAB19-10	Computer Reviews
IAB19-11	Data Centres
IAB19-12	Databases
IAB19-13	Desktop Publishing
IAB19-14	Desktop Video
IAB19-15	Email
IAB19-16	Graphics Software
IAB19-17	Home Video / DVD
IAB19-18	Internet Technology
IAB19-19	Java
IAB19-20	Javascript
IAB19-21	Mac Support
IAB19-22	MP3/MIDI
IAB19-23	Net Conferencing
IAB19-24	Net For Beginners
IAB19-25	Network Security
IAB19-26	Palmtops/PDA's
IAB19-27	PC Support
IAB19-28	Portable
IAB19-29	Entertainment
IAB19-30	Shareware/Freeware
IAB19-31	Unix
IAB19-32	Visual Basic
IAB19-33	Web Clip Art
IAB19-34	Web Design / HTML
IAB19-35	Web Search
IAB19-36	Windows
IAB20	Travel
IAB20-1	Adventure Travel
IAB20-2	Africa
IAB20-3	Air Travel
IAB20-4	Australia & New Zealand



IAB20-5	Bed & Breakfasts
IAB20-6	Budget Travel
IAB20-7	Business Travel
IAB20-8	By US Locale
IAB20-9	Camping
IAB20-10	Canada
IAB20-11	Caribbean
IAB20-12	Cruises
IAB20-13	Eastern Europe
IAB20-14	Europe
IAB20-15	France
IAB20-16	Greece
IAB20-17	Honeymoons/Getaways
IAB20-18	Hotels
IAB20-19	Italy
IAB20-20	Japan
IAB20-21	Mexico & Central America
IAB20-22	National Parks
IAB20-23	South America
IAB20-24	Spas
IAB20-25	Theme Parks
IAB20-26	Travelling with Kids
IAB20-27	United Kingdom
IAB21	Real Estate
IAB21-1	Apartments
IAB21-2	Architects
IAB21-3	Buying / Selling Homes
IAB22	Shopping
IAB22-1	Contests & Freebies
IAB22-2	Couponing
IAB22-3	Comparison
IAB22-4	Engines
IAB23	Religion & Spirituality
IAB23-1	Alternative Religions
IAB23-2	Atheism / Agnosticism
IAB23-3	Buddhism
IAB23-4	Catholicism
IAB23-5	Christianity
IAB23-6	Hinduism
IAB23-7	Islam
IAB23-8	Judaism
IAB23-9	Latter Day Saints
IAB23-10	Pagan / Wiccan
IAB24	Uncategorized



IAB25	Non Standard Content
IAB25-1	Unmoderated UGC
IAB25-2	Extreme Graphic / Explicit Violence
IAB25-3	Pornography
IAB25-4	Profane Content
IAB25-5	Hate Content
IAB25-6	Under Construction
IAB25-7	Incentivized
IAB26	Illegal Content
IAB26-1	Illegal Content
IAB26-2	Warez
IAB26-3	Spyware / Malware
IAB26-4	Copyright Infringement

5.2 CREATIVE ATTRIBUTES

List of creative attributes **not** to be displayed (passed in the batrr parameter).

Value	Description
1	Audio Ad (Auto Play)
2	Audio Ad (User Initiated)
3	Expandable (Automatic)
4	Expandable (User Initiated – Click)
5	Expandable (User Initiated – rollover)
6	In Banner Video (Auto Play)
7	In Banner Video (User Initiated)
8	Pop – Over, Under or on Exit
9	Provocative
10	Shaky Flashing
11	Surveys
12	Text Only
13	User Interactive
14	Windows Dialog
15	Has Audio on/off button
16	Ad can be skipped
17	Adobe Flash

5.3 AD POSITION

List of possible values passed in the pos parameter.

Value	Description
0	Unknown



1	Above the Fold
3	Below the Fold

5.4 EXPANDABLE DIRECTION

List of possible expandable directions (passed in the expdir parameter).

Value	Description
1	Left
2	Right
3	Up
4	Down
5	Full Screen

5.5 API FRAMEWORKS

This is a list of supported API frameworks.

Value	Description
1	VPAID 1.0
2	VPAID 2.0
3	MRAID-1
4	ORMMA
5	MRAID-2
6	MRAID-3

5.6 PROTOCOLS

Value passed to indicate the options for video bid response protocols.

Value	Description
1	VAST 1.0
2	VAST 2.0
3	VAST 3.0
4	VAST 1.0 Wrapper
5	VAST 2.0 Wrapper
6	VAST 3.0 Wrapper
7	VAST 4.0
8	VAST 4.0 Wrapper
11	VAST 4.1
12	VAST 4.1 Wrapper



5.7 VIDEO PLACEMENT TYPES

The following table lists the types of video placements supported by Improve Digital.

Value	Description
1	In-Stream : Played before, during or after the streaming video content that the consumer has requested (e.g pre, mid or post roll).
3	In-Article : Loads and plays dynamically between paragraphs of editorial content; existing as a standalone branded message.

5.8 PLAYBACK METHODS

The following table lists the various video playback methods.

Value	Description
1	Auto-play sound on
2	Auto-play sound off
3	Click-to-play
4	Mouse-over
5	In view sound on
6	In view sound off

5.9 START DELAY

List of possible values for the startdelay parameter (for video banner only).

Value	Description
0	Pre-roll
-1	Generic Mid-roll
-2	Generic Post-roll

5.10 LOCATION TYPE

The following table lists the options to indicate how the geographic information was determined.

Value	Description
1	GPS/Location Service
2	IP Address



5.11 DEVICE TYPE

Values passed to indicate the type of device where the advertisement will be shown.

Value	Description
1	Mobile/Tablet - Version 2.0
2	Personal Computer - Version 2.0
3	Connected TV - Version 2.0
4	Phone - New for Version 2.2.
5	Tablet - New for Version 2.2.
6	Connected Device - New for Version 2.2.
7	Set Top Box - New for Version 2.2.

5.12 CONNECTION TYPE

Values passed to indicate the type of device connectivity.

Value	Description
0	Unknown
1	Ethernet
2	WIFI
3	Cellular Network – Unknown Generation
4	Cellular Network – 2G
5	Cellular Network – 3G
6	Cellular Network – 4G

5.13 IMPROVE SPECIFIC CONSENT VALUES

List of Improve specific consent values regarding `ext.improve_consent`.

Value	Description
0	No consent - Bid requests is sent without the personal data fields. User matching with 3 rd parties will not take place.
1	Consent - Bid requests is sent with the personal data fields. User matching with 3 rd parties will take place.
2	Legitimate interest - Bid requests is sent with the personal data fields. User matching with 3 rd parties will take place.
3	Unknown consent and user in EU - Bid requests is sent without the personal data fields. User matching with 3 rd parties will not take place.
4	User not in EU - Bid requests is sent with the personal data fields. User matching with 3 rd parties will take place.



9	Unconfirmed legitimate interest from the publisher - Bid requests is sent with the personal data fields. User matching with 3rd parties will take place.
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5.14 CONTEXT TYPE IDs

List of examples of context types

Value	Description
1	Content-centric context such as newsfeed, article, image gallery, video gallery, or similar.
2	Social-centric context such as social network feed, email, chat, or similar.
3	Product context such as product listings, details, recommendations, reviews, or similar.
4	Unknown

5.15 CONTEXT SUB TYPE IDs

List of examples of context sub types

Value	Description
10	General or mixed content.
11	Primarily article content (which of course could include images, etc 11 as part of the article)
12	Primarily video content
13	Primarily audio content
14	Primarily image content
15	User-generated content - forums, comments, etc
20	General social content such as a general social network
21	Primarily email content
22	Primarily chat/IM content
30	Content focused on selling products, whether digital or physical
31	Application store/marketplace
32	Product reviews site primarily (which may sell product secondarily)

5.16 PLACEMENT TYPE IDs

List of examples of context sub types

Value	Description
1	In the feed of content - for example as an item inside the organic 1 feed/grid/listing/carousel.
2	In the atomic unit of the content - IE in the article page or single



	image 2 page
3	Outside the core content - for example in the ads section on the right 3 rail, as a banner-style placement near the content, etc.
4	Recommendation widget, most commonly presented below the article 4 content.
5	Unknown

5.17 MACROS - lurl

List of macros supported through the "lurl" field

Macro	Description
<code>\${AUCTION_ID}</code>	ID of the bid request; from BidRequest.id attribute.
<code>\${AUCTION_BID_ID}</code>	ID of the bid; from BidResponse.bid.id attribute.
<code>\${AUCTION_SEAT_ID}</code>	ID of the bidder seat for whom the bid was made.
<code>\${AUCTION_AD_ID}</code>	ID of the ad markup the bidder wishes to serve; from bid.adid attribute.
<code>\${AUCTION_LOSS}</code>	Loss reason codes.

5.18 LOSS NOTIFICATION CODES

List of notification codes and descriptions

Code	Description
1	Internal Error
3	Invalid Bid Response
4	Invalid Deal ID
6	Invalid (i.e., malformed) Advertiser Domain
7	Missing Markup
8	Missing Creative ID
9	Missing Bid Price
10	Missing Minimum Creative Approval Data
100	Bid was Below Auction Floor
101	Bid was Below Deal Floor
102	Lost to Higher Bid (from the same DSP/Seat)
103	Lost to a Bid for a PMP Deal
104	Buyer Seat Blocked
203	Creative Filtered - Size Not Allowed
204	Creative Filtered - Incorrect Creative Format
205	Creative Filtered - Advertiser Exclusions
207	Creative Filtered - Not Secure
209	Creative Filtered - Category Exclusions
210	Creative Filtered - Creative Attribute Exclusions
1001	Valid bid lost Improve Digital auction to another DSP/Seat



5.19 EVENT TYPES

Type ID	Name	Description
1	impression	Impression
2	viewable-mrc50	Visible impression using MRC definition at 50% in view for 1 second.
3	viewable-mrc100	100% in view for 1 second (ie GroupM standard)
4	viewable-video50	Visible impression for video using MRC definition at 50% in view for 2 seconds.

5.20 EVENT TRACKING METHODS

Type ID	Name	Description
1	img	Image-pixel tracking – URL provided will be inserted as a 1x1 pixel at the time of the event.
2	js	Javascript-based tracking – URL provided will be inserted as a js tag at the time of the event.

5.21 CONTENT DELIVERY METHODS

Value	Description
1	Streaming
2	Progressive
3	Download

5.22 FEED TYPES

Value	Description
1	Music service
2	AM/FM Broadcast
3	Podcast



5.23 VOLUME NORMALIZATION MODES

Value	Description
0	None
1	Ad Volume Average Normalized to Content
2	Ad Volume Peak Normalized to Content
3	Ad Loudness Normalized to Content
4	Custom Volume Normalization

5.24 PRODUCTION QUALITY

Value	Description
0	Unknown
1	Professionally produced
2	Prosumer
3	User Generated (UGC)

5.25 CONTENT CONTEXT

Value	Description
0	Unknown
1	Professionally produced
2	Prosumer
3	User Generated (UGC)

5.26 IQG MEDIA RATINGS

Value	Description
1	All audiences
2	Everyone over 12
3	Mature audiences