
BID SWITCH

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IPONWEB

BidSwitch Protocol

Release 5.1

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BidSwitch provides real-time bid/offer access for supply and demand partners across all online media advertising types: display, mobile, video, native, etc. Integrating with BidSwitch allows advertising platforms engage with new Buyers and Suppliers, enter new geographical regions, and utilise new media types by providing a unifying layer for parties using many different technologies to run their businesses.

BidSwitch enables this by developing a custom Supplier protocol based on the OpenRTB 2.x specification. This lets all parties integrated with the BidSwitch platform conduct business with each other through a single point of integration.

The protocol defines how buyers interact with BidSwitch. This guide covers the latest version of the BidSwitch Real-time Bidding protocol. The protocol is based on the latest [OpenRTB Protocol Specification V2.4¹](#), but an exact match is not possible due to the evolving nature of both the business, and the OpenRTB specification.

Note: It is best practice to always integrate with BidSwitch using the latest version of the protocol, for more information, see the *Compatibility and Deprecation* (page 2) section.

¹ <http://www.iab.com/guidelines/real-time-bidding-rtb-project/>

The BidSwitch protocol is a constantly evolving technology. As such, it regularly undergoes changes which behoove customers to keep their integration with the BidSwitch platform up to date. Along with the [BidSwitch Protocol v5.1²](#) documentation, use this section and the *Protocol Version Differences* (page 14) section to keep your integration up to date.

1.1 Deprecation

Any part of the specification which gets deprecated will be marked using the following style. In most circumstances a pointer to what you should do to update your implementation of the specification will be provided.

Deprecated since version X.Y.

1.2 Deprecation Timeframe

Deprecated feature support in the codebase is guaranteed for five specification releases after deprecation. Starting with the sixth specification release after deprecation, any deprecated feature is used at the at Buyers's own risk.

² <https://docs.bidswitch.com/standards/standards.html#bsw-proto>

1.3 Backward Compatibility

All specifications with the same major version number are backward compatible. Specifications with different major version numbers are not guaranteed to be backward compatible. You can compare previous specifications against the current implementation using the following PDFs.

- BidSwitch 2.1³ | BidSwitch 2.2⁴ | BidSwitch 2.3⁵
BidSwitch 2.4⁶ | BidSwitch 2.5⁷ | BidSwitch 2.6⁸
- BidSwitch 4.0⁹ | BidSwitch 4.1¹⁰ | BidSwitch 4.2¹¹ | BidSwitch 4.3¹²
- BidSwitch 5.0¹³ | BidSwitch 5.1¹⁴

³ https://docs.bidswitch.com/_downloads/BidSwitch_specs_2.1.pdf

⁴ https://docs.bidswitch.com/_downloads/BidSwitch_specs_2.2.pdf

⁵ https://docs.bidswitch.com/_downloads/BidSwitch_specs_2.3.pdf

⁶ https://docs.bidswitch.com/_downloads/BidSwitch_specs_2.4.pdf

⁷ https://docs.bidswitch.com/_downloads/BidSwitch_specs_2.5.pdf

⁸ https://docs.bidswitch.com/_downloads/BidSwitch_specs_2.6.pdf

⁹ https://docs.bidswitch.com/_downloads/BidSwitch_specs_4.0.pdf

¹⁰ https://docs.bidswitch.com/_downloads/BidSwitch_specs_4.1.pdf

¹¹ https://docs.bidswitch.com/_downloads/BidSwitch_specs_4.2.pdf

¹² https://docs.bidswitch.com/_downloads/BidSwitch_specs_4.3.pdf

¹³ https://docs.bidswitch.com/_downloads/BidSwitch_specs_5.0.pdf

¹⁴ https://docs.bidswitch.com/_downloads/BidSwitch_specs_5.1.pdf

CHAPTER 2

PROTOCOL RELEASE NOTES

- [5.1](#) (page 4) | [5.0](#) (page 5)
- [4.3](#) (page 5) | [4.2](#) (page 6) | [4.1](#) (page 7) | [4.0](#) (page 8)
- [2.6](#) (page 9) | [2.5](#) (page 9) | [2.4](#) (page 10) | [2.3](#) (page 11) | [2.3](#) (page 12) | [2.1](#) (page 12) | [2.0](#) (page 13)

2.1 v5.1 - October 2016

Added

Added the *DOOH Ad Example* (page 70) request example

Added the following bid request fields:

- `ext.dooh`
- `video.ext.vast_url_rq`
- `user.data.segment.name`
- `publisher.cat`

Updated

- Updated the `seatbid.bid.ext.vast_url` description, this field can be omitted for some bid requests.

2.2 v5.0 - July 2016

Added

- Added the *5.x Updating Overview* (page 18) section
- Added the `seatbid.bid.ext.daast_url` bid response field.
- Added the *Audio Bid Response* (page 86) example

Updated

- Updated the `seatbid.bid.ext.vast_url` description, this field can only be used for video trading.
- Updated the `adm` and `nurl` fields, see the *Bid Object* (page 75) section.
- Updated the *Macros* (page 105) section with added win price macro usage options.
- Updated the *nurl Response Difference* (page 15) section with information about how to use the `nurl` and `adm` fields correctly.

2.3 v4.3 - May 2016

Added

Added the *Compatibility and Deprecation* (page 2) and *Protocol Version Differences* (page 14) sections to help users keep their BidSwitch integration up to date.

Added the following bid response fields:

- `seatbid.bid.ext.native.ext.viewtracker`
- `seatbid.bid.ext.native.ext.adchoiceurl`

Added the following bid request fields:

- `imp.audio`
- `device.geo.utcoffset`
- `video.ext.outstream`
- `ext.tv`
- `imp.banner.format`

Added programmatic TV bid request example.

Updated

- Updated the `badv`, `site` and `app` field descriptions.
- Bid response fields `seatbid.bid.ext.native.assets.img.h` and `seatbid.bid.ext.native.assets.img.w` are now required.
- The `imp.pmp.private_auction` field is now optional.
- Deprecated the `imp.banner.ext.extra_sizes` bid request field.
- The `ext.vast_url` field now supports DAAST (audio) creatives.

Removed

- Removed fields and objects deprecated in *v4.0 - May 2015* (page 8).
- Removed the `ext.creative_params` and `data` bid request fields.

2.4 v4.2 - March 2016

Added

Added support for the following bid request fields:

- `allimps`
- `ext.s2s_nurl`
- `imp.exp`
- `imp.video.maxextended`
- `imp.video.boxingallowed`
- `imp.video.playbackmethod`
- `imp.video.delivery`
- `imp.video.sequence`
- `device.w`
- `device.h`
- `device.lmt`
- `device.pxratio`
- `site.privacypolicy`
- `app.privacypolicy`
- `user.yob`
- `user.gender`
- `user.data`
- `user.ext.ug`
- `user.ext.cookie_age`

Added the following bid response fields:

- `seatbid.bid.crid`
- `seatbid.bid.ext.agency_id`

- Added the *Compatibility and Deprecation* (page 2) section.
- Added the *Data Format* (page 104) section.

Updated

- BidSwitch now supports Compressed JSON as an alternative bid request and bid response data format.
- The `seatbid.bid.adid` bid response field is now optional, and the `seatbid.bid.crid` field may be used instead of it.
- Removed fields and objects deprecated in *v2.6 - February 2015* (page 9).

2.5 v4.1 - September 2015

Added

Added the following bid request fields:

- `site.ref`
- `ext.clktrkrq`
- `ext.gumgum.cat`
- `imp.tagid`
- `imp.native.request.assets.img.mimes`
- `user.keywords`
- `imp.ext.yieldone.cat`
- `imp.bidfloorcur`
- `pmp.deal.bidfloorcur`

Updated

- Updated the bid request currency array so that it may contain multiple values.
- Extended enumeration for the `imp.video.ext.player_type` bid request field.
- Updated the `imp.video.mimes` bid request field description.
- Updated the `seatbid.bid.url` bid response field description.
- Changed the accepted `seatbid.bid.cat` type bid response field to a strings array.
- Updated the *Supplier Click Tracking URL Macro* (page 106) section.
- Updated the *Bid Request JSON Examples* (page 54) section, added new example requests and responses.

Removed

Removed fields and objects deprecated in *v2.5 - December 2014* (page 9).

2.6 v4.0 - May 2015

Added

- Added the *Supported Rich Media Frameworks* (page 109) section.
- Added native inventory support.
- Added the *Data Object* (page 53) and *Segment Object* (page 54).

Added the following bid request fields:

- `site.mobile`
- `device.geo.type`
- `imp.iframebuster`

Added the following bid response fields:

- `seatbid.bid.cat`
- `seatbid.bid.adm`
- `seatbid.bid.ext.native`

Updated

- Updated the `imp.banner.btype` bid request field description.
- Updated the `seatbid.bid.nurl` bid response field description.
- Updated the *Macros* (page 105) section, `#{CLICK_URL}` is no longer supported.
- Bid response fields `seatbid.seat` and `seatbid.bid.nurl` are now required.
- Bid response `seatbid.bid.iurl` field is now required for banner ads.

Removed

- Removed fields and objects deprecated in *v2.4 - October 2014* (page 10).
- Removed the *Creative approval* and *Additional Features* sections.
- Deprecated `site.ext.mobile_site` and `ext.ghostery` bid request fields.
- Deprecated `seatbid.bid.ext.cat` bid response field.

Removed the following bid response fields. See this *Protocol Version Differences* (page 14) section for more details about how this affects the different major versions.

- `seatbid.bid.ext.js_url`
- `seatbid.bid.ext.img_url`
- `seatbid.bid.ext.click_url`

2.7 v2.6 - February 2015

Added

Added the following bid request fields:

- `imp.secure`
- `imp.banner.ext.extra_sizes`
- `imp.ext.viewability`

Added the following bid response fields:

- `seatbid.bid.ext.lpdomain`
- `seatbid.bid.h`
- `seatbid.bid.w`
- `seatbid.bid.iurl bid`

Deprecated

- Deprecated the `ext.is_secure` bid request field. The new `imp.secure` field replaces this, see the *Impression Object* (page 24) section for more details.

General

- Removed creative preview section.
- Removed fields and objects deprecated in *v2.3 - September 2014* (page 11).
- Updated request and response samples.

2.8 v2.5 - December 2014

Added

Added the following bid request fields:

- `imp.video.ext.player_type`
- `imp.ext.yieldone.allowed_creative_category_id`

Added the following bid response fields:

- `seatbid.bid.ext.yieldone.creative_category_id`

- `ext.protocol`
- `seatbid.bid.attr`
- `seatbid.bid.dealid`

Updated

- Click tracking macro is now required in OpenX bids.
- The field `imp.pmp.deal.at` is now optional.

Removed

- Removed fields and objects deprecated in *v2.2 - June 2014* (page 12).
- Deprecated the `seatbid.bid.ext.deal` bid response field.

2.9 v2.4 - October 2014

Added

Added the following bid request fields:

- `tmax`
- `app.paid`
- `regs.coppa`
- `device.dnt`
- `device.ipv6`
- `device.js`
- `device.flashver`
- `device.devicetype`
- `site.name`
- `imp.instl`
- `imp.displaymanagerapp`
- `imp.displaymanagerver`
- `imp.ext.yieldone.allowed_creative_types`
- `imp.video.pos`
- `imp.ext.inventory_class`

Added the following bid response field:

- `seatbid.bit.ext.yieldone.creative_type`

Updated

Changed the `imp.pmp.deals.at` values to comply with OpenRTB 2.2¹⁵.

Removed

Deprecated the `imp.ext.yielddone.inventory_class` bid request field.

2.10 v2.3 - September 2014

Added

- Added *Video Object Example* (page 34).
- Added Creative Approval section.

Added the following bid requests fields:

- `site.ext.mobile_site`
- `imp.banner.mimes`

Added the following bid request objects:

- `imp.ext.yielddone`
- `imp.pmp`
- `ext.creative_params`

Added the following bid response fields:

- `seatbid.bid.ext.duration`
- `seatbid.bid.ext.img_url`
- `seatbid.bid.ext.click_url`

Updated

- Updated the *Buyer User Matching* (page 99) section.
- The field `imp.video.linearity` is now an optional field.
- Updated the `btype` field description.

Important: Usage of `nurl`, `ext.js_url` or `ext.liveintent.img_url` bid response fields depends on the `btype` bid request field value.

¹⁵ http://www.iab.com/wp-content/uploads/2015/06/OpenRTBAPISpecificationVersion2_2.pdf

Removed

- Deprecated `seatbid.bid.ext.liveintent` and `pmp` objects.

2.11 v2.2 - June 2014

Added

- Added the following bid request fields:
 - `imp.video.protocols`
 - `imp.banner.api`
 - `site.publisher.name`
 - `app.publisher.name`
 - `app.name`
 - `video.companionad.id`
 - `device.os`
 - `device.osv`
 - `device.make`
 - `device.model`
- Added extended sensitive categories, used in `bcat` field.
- Added `imp.ext.google` and `ext.ghostery` bid request objects.

Removed

- Deprecated the following bid request fields:
 - `imp.video.protocol`
 - `ext.google.excluded_attribute`
 - `ext.google.allowed_vendor_type`

2.12 v2.1 - April 2014

Added

- Added `seatbid.bid.ext.js_url` bid response field.
- Added the following bid request fields:
 - `pmp.deals.wseat`
 - `imp.banner.expir`
 - `at`

Updated

- Bid response `seatbid.bid.nurl` field is optional now.

2.13 v2.0 - February 2014

Added

- Added application traffic support.
- Added the following bid request fields:
 - `ext.google.excluded_attribute`
 - `ext.google.allowed_vendor_type`
- Added the following bid response fields:
 - `seatbid.bid.ext.google`
 - Added `seatbid.bid.cid`

Updated

- Bid request `site` object is optional now.

CHAPTER 3

PROTOCOL VERSION DIFFERENCES

Note:

- This section covers the difference between 2.x and 4.x. For 5.x information see the *5.x Updating Overview* (page 18) section.
- The differences between each protocol affect only the format and interpretation of the bid response. Bid requests work exactly the same.

The BidSwitch protocol has three major versions, 2.X, 4.X, and 5.x. Certain fields and the interpretation of data in them differ between each version. This section outlines the differences between 2.x and 4.x.

- The bid response `nurl` field is interpreted differently, see the *nurl Response Difference* (page 15) section for details.
- Ensure that the protocol version field, which is used to define how the response will be interpreted by BidSwitch, is set to the correct protocol version. See the *Bid Response Ext Object* (page 74) section for more details.
- In 4.x the `adm` field is required for display ads, see the *Bid Object* (page 75) section for more details.
- The following bid extension fields are valid in 2.X, but not in 4.X. For more details, see the *Deprecated 2.x Properties* (page 15) section.
 - `img_url`
 - `js_url`
 - `click_url`

3.1 nurl Response Difference

The `nurl` bid response field is handled differently between each version. Use the table below to understand the expected response format for each version. For more information, see the *Bid Object* (page 75) section.

Table 3.1: nurl Version Differences

| Version | Properties |
|---------|--|
| 2.x | <p>The win notice URL.</p> <ul style="list-style-type: none"> • For banner impressions the ad markup should be returned via this URL. Ad markup should be in HTML format. • For video impressions the URL should contain the URL of impression pixel. • The URL may contain substitution macros, see the <i>Macros</i> (page 105) section. • For application banner inventory this field will be IGNORED, use <code>ext.js_url</code> instead. |
| 4.x | <p>The win notice URL.</p> <ul style="list-style-type: none"> • This field should not be used for submitting creative markup. • The URL should contain the win price macro, see the <i>Macros</i> (page 105) section. • As this URL is called from the user's browser, it should be SSL-compliant for requests with <code>imp.secure</code> set to 1. • This URL will be called by a server to server call if the bid request has the <code>ext.s2s_nurl</code> field value set to 1. |
| 5.x | <p>The win notice URL.</p> <ul style="list-style-type: none"> • Similar to 4.x, except that the win price macro can only be used in one field per bid response. Either the <code>adm</code> or <code>nurl</code> field. See the <i>5.x Updating Overview</i> (page 18) or <i>Bid Object</i> (page 75) section for details. |

3.2 Deprecated 2.x Properties

The following fields are not valid in a 4.x response, but are part of the 2.x protocol. See the *Bid Ext Object* (page 77) section for the latest protocol standards.

Table 3.2: Bid Ext 2.X Objects

| Field | Value | Description |
|-------------------|---------------|--|
| <i>img_url*</i> | <i>string</i> | The URL of the creative image. In order to receive the user cookie and win price, this url should point to the Buyer handler and redirect to the actual creative location. The url may contain the win price macro, e.g. <code>\${AUCTION_PRICE}</code> , but not the click macro. If this field is present, the <code>nurl</code> field of the bid response will be ignored. |
| <i>click_url*</i> | <i>string</i> | The creative click URL. Required if the <code>img_url</code> field is present. |
| <i>js_url*</i> | <i>string</i> | A Javascript-based win notice URL. <ul style="list-style-type: none"> • For in-app inventory, the ad markup should be returned using this URL. • For website or video inventory this field may be used as a substitute for the <code>nurl</code> field. • Ad markup should be in JavaScript format. • The URL may contain macros, see the <i>Macros</i> (page 105) section for more details. |

3.3 Valid Response Formats

For valid 4.x response examples, see the *Buyer No Bid Response* (page 91) section. If you wish to check for valid 2.x response formats see the 2.x guides, for example 2.6¹⁶ or 2.5¹⁷.

The following diff examples show how the expected JSON response has changed between version. The green represents the changes in 4.x, and the red shows version 2.x syntax.

Example Response diff

```

{
  "id": "1234567890",
  "ext": {
-   "protocol": "2.5"
+   "protocol": "4.2"
  },
  "seatbid": [
    {
      "bid": [
        {
          "id": "1",
          "impid": "102",
          "price": 9.43,

```

¹⁶ https://my.bidswitch.net/bidswitch_assets/api_spec/BidSwitch_specs_2.6.pdf

¹⁷ https://my.bidswitch.net/bidswitch_assets/api_spec/BidSwitch_specs_2.5.pdf

```

        "adid": "314",
        "cid": "42",
        "cat": [
            "IAB12"
        ],
+       "adm": "<a href=\"http://adserver.com/click?adid=12345&tracker=${CLICK_
↵URL:URLENCODE}\"><img src=\"http://image1.cdn.com/impid=102\"/></a>",
-       "nurl": "http://adserver.com/winnotice?impid=102&winprice=${AUCTION_
↵PRICE}&click_url=${CLICK_URL:URLENCODE}",
+       "nurl": "http://adserver.com/winnotice?impid=102&winprice=${AUCTION_
↵PRICE}",
        "iurl": "http://adserver.com/preview?crid=314",
        "adomain": [
            "advertiserdomain.com"
        ],
        "ext": {
            "advertiser_name": "Coca-Cola",
            "language": "en",
            "cat": "IAB12",
-           "img_url": "http://adserver.com/imp?impid=102&winprice=${AUCTION_
↵PRICE}",
-           "click_url": "http://adserver.com/click?impid=102",
            "agency_name": "CC-advertising"
        }
    }
}
]
+   "seat": "4"
}
]
}

```

CHAPTER 4

5.X UPDATING OVERVIEW

The main difference between 5.x and previous versions (v2.x and v4.x) is that it allows the `adm` bid response field to contain the win price macro, `#{AUCTION_PRICE}`. This simplifies the protocol by removing some extended fields, making it more compliant with OpenRTB standards, and also letting Buyers know the clearing price at the time the creative markup is formed by placing the price macro in the `iframe` source URL.

Upgrading to this version from v2.x will also grant users access to features added in v4.x of the protocol such as native, audio, and programmatic TV.

There is a number of usage limitations around the price macro being placed in the `adm` field:

- No more than one macro can be used in the `adm` field, otherwise BidSwitch records multiple impression events.
- The `#{AUCTION_PRICE}` should be a part of a valid URL.
- The `#{AUCTION_PRICE}` should be present in only one of either the `adm` field or `nurl` field, never both.

Note: Only one price macro per bid response is allowed. You should not use it in the `adm` and `nurl` fields simultaneously.

4.1 URL Formatting

The price macro must be placed within a valid URL and located in the `src` attribute of an HTML tag (e.g. `<iframe>`, `<script>` or ``). Use the following examples to ensure you use the correct syntax.

```
# valid URLs
"adm": "<iframe src=\"http://dsp.com/imp?bc=12345aaabbb&price=#{AUCTION_PRICE}\"/>"
```

```
"adm": "<script src=\"http://dsp.com/js_imp?bc=12345aaabb&price=${AUCTION_PRICE}\"></script>
↪script>

# invalid URL
"adm": "<img src=\"http://cdn.com/img?id=123\" onclick=\"impfn(${AUCTION_PRICE})\"/>"
```

4.2 Server to Server Restriction

Including the price macro in the `adm` field is not allowed for bid requests that use server to server impression notification. These are marked with the `ext.s2s_nurl = 1` flag.

For server to server notifications, it is required to provide the win price macro in the `nurl` field.

4.3 Upgrading from 4.x

The 5.x protocol is fully compatible with v4.x, so to upgrade you only need to set the bid response `ext.protocol` field to “5.1”

```
{
  "id": "1234567890",
  "ext": {
    "protocol": "5.1"
  },
}
```

- If you are currently using the 4.x protocol, then no other changes are required.
- You still have the option of using the `nurl` field to send the impression clearing price as supported in 4.x versions.

Note:

- In the case of expired impressions or price errors, BidSwitch forwards impression calls originating from the `adm` field to the Buyer with a clearing price of zero. If the impression call originates from the `nurl` field then BidSwitch responds with a 1x1 pixel.
- You still have the option of using the `nurl` field to send the impression clearing price as supported in 4.x versions.

4.4 Upgrading from 2.x

To upgrade your implementation to 5.x and start using this feature, use the following steps.

1. Set the bid response `ext.protocol` field to “5.1”

2. Move the impression/ad serving URL from whichever of the following valid 2.x fields it is currently used in (`nurl` | `ext.js_url` | `ext.img_url`) to the `adm` field
3. Wrap it with the appropriate HTML tag. Use the following examples as a guide to carrying out these changes

Example 1: Replacing the `nurl` field with `adm` and wrapping the impression link with the `<iframe>` tag.

```
{
  "seatbid": {
    "bid": {
-     "nurl": "http://dsp.com/imp?bc=12345aaabbb&price=${AUCTION_PRICE}"
+     "adm": "<iframe src=\"http://dsp.com/imp?bc=12345aaabbb&price=${AUCTION_PRICE}\"
↪"></iframe>"
    }
  },
  "ext": {
-   "protocol": "2.6"
+   "protocol": "5.1"
  }
}
```

Example 2: Replacing the `ext.js_url` field with `adm` and wrapping the impression link with the `<script>` tag.

```
{
  "seatbid":{
    "bid":{
-     "ext":{
-       "js_url":"http://dsp.com/js_imp?bc=12345aaabbb&price=${AUCTION_PRICE}"
-     }
+     "adm": "<script src=\"http://dsp.com/js_imp?bc=12345aaabbb&price=${AUCTION_PRICE}\"
↪"></script>"
    }
  }
},
  "ext":{
-   "protocol": "2.6"
+   "protocol": "5.1"
  }
}
```

Example 3: Replacing the `ext.img_url` field with `adm` and wrapping the impression link with the `` tag.

```
{
  "seatbid":{
    "bid":{
-     "ext":{
-       "img_url":"http://dsp.com/img_imp?bc=12345aaabbb&price=${AUCTION_PRICE}",
-       "click_url":"http://dsp.com/click?bc=12345aaabbb"

```

```
-     }
+     "adm": "<a href=\"http://dsp.com/click?bc=12345aaabbb\">
+         <img src=\"http://dsp.com/img_imp?bc=12345aaabbb&price=${AUCTION_PRICE}
↔ \"/></a>"
    }
  },
  "ext":{
-     "protocol": "2.6"
+     "protocol": "5.1"
  }
}
```

Note:

- In the case of expired impressions or price errors, BidSwitch forwards impression calls originating from the `adm` field to the Buyer with a clearing price of zero. If the impression call originates from the `nurl` field then BidSwitch responds with a 1x1 pixel.
 - You still have the option of using the `nurl` field to send the impression clearing price as supported in 4.x versions.
 - Click tracking is also different from v2.x to v5.x, to learn more about it see the [Supplier Click Tracking URL Macro](#) (page 106) section.
-

CHAPTER 5

BID REQUEST

This is the top level object that is sent to the Buyer. Each bid request sent from BidSwitch to a Buyer will contain the following fields.

Note: Fields marked with asterisk (*) are optional.

Table 5.1: Bid Request Object Properties

| Value | Type | Description |
|---------------|-------------------------|---|
| <i>id</i> | <i>string</i> | Unique ID of the bid request, provided by BidSwitch, for example, "b5ba5ed2-547e-4e86-8a84-34a440dad6db" |
| <i>imp</i> | <i>array of objects</i> | Array of objects representing the impressions offered, for more information, see the <i>Impression Object</i> (page 24) section. |
| <i>device</i> | <i>object</i> | Device object with details about the device to which the impression will be delivered, for more information, see the <i>Device Object Properties</i> (page 42) section. |
| <i>user</i> | <i>object</i> | User Object which describes the user, for more information, see the <i>User Object</i> (page 44) section. |
| <i>tmax</i> | <i>integer</i> | Maximum time in milliseconds the exchange allows for bids to be received to avoid timeout, including internet latency, for example, 120. |
| <i>cur</i> | <i>array of strings</i> | Array of allowed currencies for bids on this bid request using ISO-4217 ¹⁸ alpha codes, for example, ["USD", "EUR"] |
| <i>ext</i> | <i>object</i> | Ext Object used for Supplier specific properties, for more information, see the <i>Ext Object</i> (page 51) section. |
| <i>at*</i> | <i>integer</i> | Auction type, the default value is 2. <ul style="list-style-type: none"> • 1: the first price auction. • 2: the second price auction. |

¹⁸ http://www.iso.org/iso/home/standards/currency_codes.htm

Table 5.2: Bid Request Object Properties

| Value | Type | Description |
|------------------|-------------------------|---|
| <i>site</i> * | <i>object</i> | The <i>Site Object</i> (page 46) describing the site. One of either <i>site</i> , <i>app</i> or <i>ext.tv</i> object should be present. |
| <i>app</i> * | <i>object</i> | The <i>App Object</i> (page 47) describing the mobile application. One of either <i>site</i> , <i>app</i> or <i>ext.tv</i> object should be present. |
| <i>bcat</i> * | <i>array of strings</i> | Blocked Advertiser Categories, using the IAB taxonomy, and extended with additional sensitive categories listed in the <i>Sensitive Categories and Rich Media</i> (page 108) section. Creatives belonging to at least one of the listed categories are not permitted for bidding in the current bid request, for example ["IAB10-1", "IAB25", "BSW3"] |
| <i>badv</i> * | <i>array of strings</i> | Array of strings of blocked top-level domains of advertisers, for example, ["mysite.com", "mysite2.com"] |
| <i>wseat</i> * | <i>array of strings</i> | An array of Buyer seats allowed to bid on this auction, for example [58, 61, 99]. If this field is present, the specified seat IDs may be supplied using BidSwitch or Supplier taxonomy. A bid request may contain multiple seat IDs using the Supplier taxonomy. The bid response should contain the appropriate seat value corresponding to one of the values of the <i>wseat</i> field, for more details see the <i>Seat Bid Object</i> (page 74) section. |
| <i>allimps</i> * | <i>integer</i> | A flag to indicate if the Supplier 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. <ul style="list-style-type: none"> • 0 = no or unknown • 1 = yes, the impressions offered represent all that are available. |
| <i>regs</i> * | <i>object</i> | A regulations object that specifies any industry, legal, or governmental regulations in force for this request, for more information, see the <i>Regulation Object</i> (page 53) section. |

5.1 Impression Object

Note: Fields marked with asterisk (*) are optional.

Table 5.3: Impression Object Properties

| Value | Type | Description |
|----------------------|----------------|---|
| <i>id</i> | <i>string</i> | ID of the impression being shown, unique within the bid request, for example "1" |
| <i>banner</i> * | <i>object</i> | The <i>Banner Object</i> (page 29) describes the ad properties. Required for banner impressions. |
| <i>video</i> * | <i>object</i> | The <i>Video Object</i> (page 32) describes the ad properties. Required for video impressions. |
| <i>audio</i> * | <i>object</i> | The <i>Audio Object</i> (page 36) describes the ad properties. Required for audio impressions. |
| <i>native</i> * | <i>object</i> | The <i>Native Object</i> (page 38) describes the ad properties. Required for native impressions. |
| <i>bidfloor</i> * | <i>float</i> | Bid floor in CPM as set by the Supplier, for example, 0.01080 |
| <i>bidfloorcur</i> * | <i>string</i> | Bid floor currency specified using ISO-4217 alpha codes, for example, "USD". |
| <i>instl</i> * | <i>integer</i> | Specifies if the ad is an interstitial. <ul style="list-style-type: none"> • 0 = not interstitial, the default value. • 1 = the ad is interstitial or full screen |
| <i>tagid</i> * | <i>string</i> | Identifier for specific ad placement or ad tag that was used to initiate the auction. This value is prefixed with the exchange name followed by underscore, for example, if Rubicon sends a bid request for a placement ID "43256", the value becomes "rubicon_43256" |
| <i>secure</i> * | <i>integer</i> | Specifies if the page is SSL compliant: <ul style="list-style-type: none"> • 0: for insecure pages, the default value. • 1: for secure pages. Creative assets for secure pages should be SSL-compliant. |

Table 5.4: Impression Object Properties

| Value | Type | Description |
|---------------------------|-------------------------|--|
| <i>iframebuster*</i> | <i>array of strings</i> | Array of names of supported iframe busters, for example, ["dc", "rb"], for more information, see the <i>Supported Rich Media Frameworks</i> (page 109) section. |
| <i>pmp*</i> | <i>object</i> | The <i>Private Marketplace Object</i> (page 49), used for direct deals between Buyers and Suppliers. |
| <i>displaymanager*</i> | <i>string</i> | Name of the ad mediation partner, SDK technology, or native player responsible for rendering the ad (typically video or mobile), for example, "SOMA" |
| <i>displaymanagerver*</i> | <i>string</i> | Version of the ad mediation partner, SDK technology, or native player responsible for rendering the ad (typically video or mobile), for example, "1.1" |
| <i>exp*</i> | <i>integer</i> | Impression expiry timeout, in seconds, for example, "300". An impression will be considered expired if it is registered later than <code>imp.exp</code> seconds after the auction. |
| <i>ext*</i> | <i>object</i> | See the <i>Impression Ext</i> (page 27) section. |

5.1.1 Example Impression Object JSON

```
{
  "imp": [
    {
      "id": "1",
      "bidfloor": 0.426,
      "banner": {
        "w": 300,
        "h": 250,
        "pos": 1,
        "topframe": 0,
        "expdir": [
          1,
          3
        ]
      }
    }
  ]
}
```

5.1.2 Impression Ext

Table 5.5: Impression Extension Properties

| Value | Type | Description |
|-------------------------|----------------|---|
| <i>google</i> | <i>object</i> | See <i>Impression Ext Google Object</i> (page 27) |
| <i>yieldone*</i> | <i>object</i> | See <i>Impression Ext Yieldone Object</i> (page 28) |
| <i>inventory_class*</i> | <i>integer</i> | Inventory class according to the Supplier classification. The Supplier classification is maintained by each Buyer and is not a BidSwitch list, for example 1 |
| <i>viewability*</i> | <i>integer</i> | This is an estimate of the likelihood that this slot will be viewable by the end user. Estimation is based on Supplier-specific data (e.g. historical viewability data, real-time data etc.). Expressed as a percentage in the range of [0, 100]. If the field is not present in the bid request then the viewability estimate is not available. For example, 100 |

5.1.3 Impression Ext Google Object

Table 5.6: Google Impression Extension Properties

| Value | Type | Description |
|-----------------------------|--------------------------|--|
| <i>excluded_attribute*</i> | <i>array of integers</i> | List of excluded creative attributes as defined by Google, for example, [70, 28, 30, 32, 22] |
| <i>allowed_vendor_type*</i> | <i>array of integers</i> | List of allowed vendor types as defined by Google. |

Note: If the `site.publisher.id` or `app.publisher.id` field value equals “google_1” then the vendors listed at the following link are also allowed to bid:

<https://storage.googleapis.com/adx-rtb-dictionaries/gdn-vendors.txt>

5.1.4 Impression Ext Yieldone Object

Table 5.7: Yieldone Impression Extension Properties

| Value | Type | Description |
|--------------------------------------|--------------------------|--|
| <i>allowed_creative_types</i> | <i>array of strings</i> | List of allowed creative types as defined by YieldOne, for example, ["HTML", "FLASH"] |
| <i>allowed_creative_category_id*</i> | <i>array of integers</i> | List of allowed creative categories as defined by YieldOne, for example, [70, 71, 72] |
| <i>cat*</i> | <i>array of integers</i> | List of site categories as defined by YieldOne, for example, [5, 16] |
| <i>inventory_class*</i> | <i>integer</i> | Inventory class according to the YieldOne classification. Deprecated since version 2.4: Use <code>imp.ext.inventory_class</code> instead. |

5.2 Banner Object

Note: Fields marked with an asterisk (*) are optional.

Table 5.8: Banner Object Properties

| Value | Type | Description |
|------------------|--------------------------|--|
| <i>id</i> | <i>string</i> | Unique identifier for the banner object, for example, 3. Can be used to tracking multiple banner objects in a companion banner array. |
| <i>w</i> | <i>integer</i> | Width of the impression in pixels, for example, 300 |
| <i>h</i> | <i>integer</i> | Height of the impression in pixels, for example 250 |
| <i>battr*</i> | <i>array of integers</i> | Blocked creative attributes as defined in the OpenRTB protocol, for example, [1, 23] |
| <i>btype</i> | <i>array of integers</i> | Blocked banner ad types as defined in the OpenRTB protocol, for example, [4, 21] |
| <i>pos*</i> | <i>integer</i> | Ad Position as defined in the OpenRTB protocol, for example, 1 |
| <i>topframe*</i> | <i>integer</i> | Indicates if the banner is in the top frame as opposed to an iframe. <ul style="list-style-type: none"> • 0 = no • 1 = yes. |
| <i>mimes*</i> | <i>array of strings</i> | Specifies the content MIME types supported, common MIME types include "text/html", "application/x-shockwave-flash", and "image/gif". For example: ["video/mp4", "image/jpg"] |
| <i>expdir*</i> | <i>array of integers</i> | Possible expansion directions for an expandable ad, for example, [2,5]. This can take the following values: <ul style="list-style-type: none"> • 1: Left • 2: Right • 3: Up • 4: Down • 5: Full screen If the field is not present, expandable creatives are not allowed. |
| <i>format</i> | <i>array or objects</i> | An array of format objects, see <i>Format Object</i> (page 30), denoting the alternative sizes that may be used for bidding. If one of the alternative ad sizes is used in the bid response, then the <code>seatbid.bid.h</code> and <code>seatbid.bid.w</code> fields are required in the bid response. |
| <i>api*</i> | <i>array of integers</i> | List of supported API frameworks for this impression as defined in the OpenRTB, for example [3, 5]. If an API is not explicitly listed, it is assumed not to be supported. |
| <i>ext*</i> | <i>object</i> | See the <i>Banner Ext Object</i> (page 30) section. |

5.2.1 Banner Ext Object

Table 5.9: Banner Ext Object Properties

| Value | Type | Description |
|--------------------|-------------------------|---|
| <i>extra_sizes</i> | <i>array or objects</i> | An array of format objects, see <i>Format Object</i> (page 30), denoting the alternative sizes that may be used for bidding. If one of the alternative ad sizes is used in the bid response, then the <code>seatbid.bid.h</code> and <code>seatbid.bid.w</code> fields are required in the bid response. Deprecated since version 4.3: use <code>imp.banner.format</code> instead. |

5.2.2 Banner JSON Example

```
{
  "banner": {
    "id": "abc123",
    "w": 300,
    "h": 250,
    "pos": 1,
    "topframe": 0,
    "btype": [
      2,
      3
    ],
    "mimes": [
      "text/html",
      "application/x-shockwave-flash"
    ],
    "format": [
      {
        "h": 50,
        "w": 300
      }
    ]
  }
}
```

5.3 Format Object

Table 5.10: Format Object Properties

| Value | Type | Description |
|----------|----------------|---|
| <i>h</i> | <i>integer</i> | Height of the impression in pixels, for example 500 |
| <i>w</i> | <i>integer</i> | Width of the impression in pixels, for example 340 |

```
{  
  "format": [{  
    "w": 300,  
    "h": 250  
  }]  
}
```

5.4 Video Object

Note: Fields marked with an asterisk (*) are optional.

Table 5.11: Video Object Properties

| Value | Type | Description |
|--------------------|--------------------------|---|
| <i>mimes</i> | <i>array of strings</i> | Content MIME types supported. Note: For Google bids all the specified MIME type media files are required in the VAST response, for example, ["video/mpeg", "video/mp4"] |
| <i>minduration</i> | <i>integer</i> | Minimum video ad duration in seconds, for example, 2 |
| <i>maxduration</i> | <i>integer</i> | Maximum video ad duration in seconds, for example, 15 |
| <i>linearity*</i> | <i>integer</i> | Indicates if the impression must be linear or nonlinear, for example, 1. If none is specified, it is assumed all are allowed <ul style="list-style-type: none"> • 1: Linear/In-stream • 2: Non-Linear/Overlay |
| <i>protocols</i> | <i>array of integers</i> | Accepted video bid response protocols as defined in OpenRTB, for example [2,5] |
| <i>pos*</i> | <i>integer</i> | Ad Position as defined in OpenRTB, for example 1 |
| <i>w*</i> | <i>integer</i> | Width of the player in pixels, for example, 600 |
| <i>h*</i> | <i>integer</i> | Height of the player in pixels, for example 400 |
| <i>startdelay*</i> | <i>integer</i> | Indicates the start delay in seconds. If the start delay value is greater than 0, then the position is mid-roll and the value indicates the start delay. <ul style="list-style-type: none"> • > 0: Mid-Roll (value indicates start delay in second) • 0: Pre-roll • -1: Generic mid-roll • -2: Generic post-roll |
| <i>battr*</i> | <i>array of integers</i> | Blocked creative attributes as defined in OpenRTB, for example, [6] |
| <i>minbitrate*</i> | <i>integer</i> | Minimum bit rate in Kbps, for example 680 |
| <i>maxbitrate*</i> | <i>integer</i> | Maximum bit rate in Kbps, for example 990 |
| <i>api*</i> | <i>array of integers</i> | List of supported API frameworks for this impression as defined in OpenRTB, for example, [1,2]. If an API is not explicitly listed, it is assumed not to be supported. |

Table 5.12: Video Object Properties

| Value | Type | Description |
|------------------------|--------------------------|---|
| <i>maxextended*</i> | <i>integer</i> | Maximum extended video ad duration if extension is allowed. <ul style="list-style-type: none"> • Blank or 0, extension is not allowed. • -1, extension is allowed, and there is no time limit imposed. • Greater than 0, then the value represents the number of seconds of extended play supported beyond the <code>maxduration</code> value. |
| <i>boxingallowed*</i> | <i>integer</i> | Indicates if letter-boxing of 4:3 content into a 16:9 window is allowed: <ul style="list-style-type: none"> • 0 = no • 1 = yes. |
| <i>playbackmethod*</i> | <i>array of integers</i> | Allowed playback methods as defined in the OpenRTB, for example [1, 2]. If none are specified, it is assumed all are allowed. |
| <i>delivery*</i> | <i>array of integers</i> | Supported delivery methods (e.g., streaming, progressive) as defined in OpenRTB. If none specified, assume all are supported, for example, [1, 2] |
| <i>sequence*</i> | <i>integer</i> | If multiple ad impressions are offered in the same bid request, the sequence number will allow for the coordinated delivery of multiple creatives, for example, 2. |
| <i>companionad*</i> | <i>object array</i> | Array of Banner objects if companion ads are available. See the <i>Banner Object</i> (page 29) section for more information. |
| <i>companiontype*</i> | <i>array of integers</i> | List of allowed companion ad types, for example [1, 2] Possible values: <ul style="list-style-type: none"> • 1: Static Resource • 2: HTML Resource • 3: iframe Resource |
| <i>ext*</i> | <i>object</i> | See the <i>Video Ext Object</i> (page 34) section |

5.4.1 Video Ext Object

Table 5.13: Video Ext Object Properties

| Value | Type | Description |
|---------------------|----------------|---|
| <i>skippable</i> | <i>integer</i> | Indicates whether the video ad may be skippable (i.e. contain a skip button). The values are: <ul style="list-style-type: none"> • 0: allow skippable • 1: require skippable • 2: deny skippable |
| <i>player_type</i> | <i>integer</i> | Video player type based on detected player size: <ul style="list-style-type: none"> • 1: Small player (Less than 300px) • 2: Medium player (between 300px and 600px) • 3: Large player (greater than 600px) |
| <i>outstream*</i> | <i>integer</i> | Indicates that the video is outstream, for example 1 |
| <i>vast_url_rq*</i> | <i>integer</i> | Used to specify if the <code>bid.ext.vast_url</code> field is required in the bid response. <ul style="list-style-type: none"> • 1: Indicates the <code>bid.ext.vast_url</code> field is required in the bid response. • 0: If this field is missing, or set as not required using 0, Buyers can pass their VAST URL in the <code>bid.nurl</code> field. The price macro will be replaced in that field as usual. In this scenario BidSwitch will not send an impression notification as the VAST impression event should be used for that. |

5.4.2 Video Object Example

```
{
  "id": "1",
  "bidfloor": 0.03,
  "video": {
    "w": 640,
    "h": 480,
    "pos": 1,
    "startdelay": 0,
    "minduration": 5,
    "maxduration": 30,
    "maxextended": 30,
    "minbitrate": 300,
    "maxbitrate": 1500,
    "api": [
      1,
      2
    ],
  ],
}
```

```
"protocols":[
  2,
  3
],
"mimes":[
  "video/x-flv",
  "video/mp4",
  "application/x-shockwave-flash",
  "application/javascript"
],
"linearity":1,
"boxingallowed":1,
"playbackmethod":[
  1,
  3
],
"delivery":[
  2
],
"batrr":[
  13,
  14
],
"companionad":[
  {
    "id":"1234567893-1",
    "w":300,
    "h":250,
    "pos":1,
    "batrr":[
      13,
      14
    ],
    "expdir":[
      2,
      4
    ]
  },
  {
    "id":"1234567893-2",
    "w":728,
    "h":90,
    "pos":1,
    "batrr":[
      13,
      14
    ]
  }
],
"companiontype":[
  1,
  2
]
```



```
}
}
```

5.5 Audio Object

Note: Fields marked with an asterisk (*) are optional.

Table 5.14: Audio Object Properties

| Value | Type | Description |
|---------------------|--------------------------|---|
| <i>mimes</i> | <i>array of strings</i> | Content MIME types supported, for example ["audio/mp4", "audio/mpeg"] |
| <i>minduration</i> | <i>integer</i> | Minimum audio ad duration in seconds, for example, 2 |
| <i>maxduration</i> | <i>integer</i> | Maximum audio ad duration in seconds, for example, 15 |
| <i>protocols</i> | <i>array of integers</i> | Accepted audio bid response protocols as defined in OpenRTB, for example [9, 10] |
| <i>startdelay*</i> | <i>integer</i> | Indicates the start delay in seconds, or generic values below: <ul style="list-style-type: none"> • 0: Pre-roll • -1: Generic mid-roll • -2: Generic post-roll |
| <i>battr*</i> | <i>array of integers</i> | Blocked creative attributes as defined in OpenRTB, for example, [6] |
| <i>minbitrate*</i> | <i>integer</i> | Minimum bit rate in Kbps, for example 32 |
| <i>maxbitrate*</i> | <i>integer</i> | Maximum bit rate in Kbps, for example 320 |
| <i>api*</i> | <i>array of integers</i> | List of supported API frameworks for this impression as defined in the OpenRTB guide, for example, [1, 2]. If an API is not explicitly listed, it is assumed not to be supported. |
| <i>maxextended*</i> | <i>integer</i> | Maximum extended audio ad duration if extension is allowed. <ul style="list-style-type: none"> • Blank or 0, extension is not allowed. • -1, extension is allowed, and there is no time limit imposed. • Greater than 0, then the value represents the number of seconds of extended play supported beyond the <i>maxduration</i> value. |
| <i>delivery*</i> | <i>array of integers</i> | Supported delivery methods (e.g., streaming, progressive) as defined in OpenRTB. If none specified, assume all are supported, for example, [1, 2] |
| <i>maxseq*</i> | <i>integer</i> | The maximum number of ads that can be played in an ad pod, for example, 1 |
| <i>feed*</i> | <i>integer</i> | Type of audio feed, for example, 1 |

Table 5.15: Audio Object Properties

| Value | Type | Description |
|-----------------------|--------------------------|---|
| <i>sequence*</i> | <i>integer</i> | If multiple ad impressions are offered in the same bid request, the sequence number will allow for the coordinated delivery of multiple creatives, for example, 2 |
| <i>stitched*</i> | <i>integer</i> | Indicates if the ad is stitched with audio content or delivered independently, for example, 1 |
| <i>nvool*</i> | <i>integer</i> | Volume normalization mode as defined in OpenRTB, for example, 1 |
| <i>companionad*</i> | <i>array of objects</i> | Array of Banner objects if companion ads are available. See the Banner Object (page 29) section for more information. |
| <i>companiontype*</i> | <i>array of integers</i> | Supported DAAST companion ad types, for example [1, 2] Possible values: <ul style="list-style-type: none"> • 1: Static Resource • 2: HTML Resource • 3: iframe Resource |

5.5.1 Audio Object Example

```
{
  "id": "1",
  "bidfloor": 0.03,
  "audio": {
    "startdelay": 0,
    "minduration": 5,
    "maxduration": 30,
    "maxextended": 30,
    "minbitrate": 300,
    "maxbitrate": 1500,
    "api": [
      1,
      2
    ],
  },
  "protocols": [
    9,
    10
  ],
  "mimes": [
    "audio/aac",
    "audio/mp4",
    "audio/mpeg"
  ],
  "delivery": [
    2
  ],
  "battr": [
    13,

```

```
    14
  ],
  "companionad": [
    {
      "id": "1234567893-1",
      "w": 300,
      "h": 250,
      "pos": 1,
      "battr": [
        13,
        14
      ],
      "expdir": [
        2,
        4
      ]
    },
    {
      "id": "1234567893-2",
      "w": 728,
      "h": 90,
      "pos": 1,
      "battr": [
        13,
        14
      ]
    }
  ],
  "companiontype": [
    1,
    2
  ]
}
```

5.6 Native Object

Note: Fields marked with an asterisk (*) are optional.

Table 5.16: Native Object

| Value | Type | Description |
|----------------|--------------------------|---|
| <i>request</i> | <i>object</i> | Contains the <i>Native Request Object</i> (page 39) object. |
| <i>battr</i> * | <i>array of integers</i> | Blocked creative attributes as defined in OpenRTB., for example, [1, 3] |
| <i>api</i> * | <i>array of integers</i> | List of supported API frameworks for this impression as defined in OpenRTB, for example [2,3,5]. If an API is not explicitly listed, it is assumed not to be supported. |

5.6.1 Native Object Example

```

{
  "native":{
    "request":{
      "ver":1,
      "layout":1,
      "adunit":4,
      "assets":[
        {
          "id":1,
          "required":1,
          "title":{
            "len":25
          }
        }
      ]
    },
    "api":[
      3
    ],
    "battr":[
      13,
      14
    ]
  }
}

```

5.7 Native Request Object

Note: Fields marked with asterisk (*) are optional.

Table 5.17: Native Request Object

| Value | Type | Description |
|-----------------|-------------------------|--|
| <i>ver*</i> | <i>integer</i> | Version of the Native Markup in use, for example, 1 |
| <i>layout*</i> | <i>integer</i> | The Layout ID of the native ad unit as described in OpenRTB Native specification, for example, 3 |
| <i>adunit*</i> | <i>integer</i> | The Ad unit ID of the native ad unit as described in OpenRTB Native specification. |
| <i>plcmcnt*</i> | <i>integer</i> | The number of identical placements in this Layout, for example, 1 |
| <i>seq*</i> | <i>integer</i> | 0 for the first ad, 1 for the second ad, and so on. This is not the sequence number of the content in the stream. |
| <i>assets</i> | <i>array of objects</i> | An array of Asset Objects. Any bid must comply with this array of elements. See the <i>Native Asset Object</i> (page 40) section for more details. |

5.7.1 Native Asset Object

Table 5.18: Native Asset Object Properties

| Value | Type | Description |
|------------------|----------------|---|
| <i>id</i> | <i>integer</i> | Unique asset id, for example 2 |
| <i>required*</i> | <i>integer</i> | Set to 1 if asset is required (exchange will not accept a bid without it), default is 0. |
| <i>title **</i> | <i>object</i> | Native title object, see the <i>Native Asset Title Object</i> (page 40) for more details. |
| <i>img **</i> | <i>object</i> | Native image object, see the <i>Native Asset Image Object</i> (page 41) for more details. |
| <i>video **</i> | <i>object</i> | Native video object, see the <i>Native Asset Video Object</i> (page 41) for more details. |
| <i>data **</i> | <i>object</i> | Native asset data object, see the <i>Native Asset Data Object</i> (page 42) section for more details. |

Note: (**) There may be exactly one of the fields marked with double asterisk in one asset object.

5.7.2 Native Asset Title Object

Table 5.19: Native Asset Title Object

| Value | Type | Description |
|------------|----------------|--|
| <i>len</i> | <i>integer</i> | Maximum length of the text in the title element, for example, 30 |

5.7.3 Native Asset Image Object

The image asset object may contain the exact image size, the minimum image size, or both. If only the exact image size is specified then the image in the bid response should have the corresponding size. If the minimum size is specified then the image asset in the bid response should comply with the following restrictions.

- The size of the image should be equal to or larger than the minimum specified
- The image asset in the bid response should contain the **w** and **h** fields.

Note: It is recommended that the aspect ratio of the image should be close to the one specified by the exact size or by the minimum size; the acceptable aspect ratio deviation is from $0.8 * (w/h)$ to $1.25 * (w/h)$

Table 5.20: Native Asset Image Object

| Value | Type | Description |
|----------------|-------------------------|---|
| <i>type</i> * | <i>integer</i> | Image asset type, for example 3. Takes the following values: <ul style="list-style-type: none"> • 1 Icon • 2 Logo (Logo image for the brand/app) • 3 Main (Large image preview for the ad) |
| <i>w</i> * | <i>integer</i> | Width of the image in pixels, for example, 300 |
| <i>wmin</i> * | <i>integer</i> | The minimum requested width of the image in pixels, for example, 100 |
| <i>h</i> * | <i>integer</i> | Height of the image in pixels, for example, 250 |
| <i>hmin</i> * | <i>integer</i> | The minimum requested height of the image in pixels, for example, 100 |
| <i>mimes</i> * | <i>array of strings</i> | Whitelist of content MIME types supported, for example, ["image/gif"] If blank, assume all types are allowed. |

5.7.4 Native Asset Video Object

Table 5.21: Native Asset Video Object

| Value | Type | Description |
|--------------------|--------------------------|---|
| <i>mimes</i> | <i>array of strings</i> | Content MIME types supported, for example, ["video/mpeg", "video/mp4"] |
| <i>minduration</i> | <i>integer</i> | Minimum video ad duration in seconds, for example, 2 |
| <i>maxduration</i> | <i>integer</i> | Maximum video ad duration in seconds, for example 15 |
| <i>protocols</i> | <i>array of integers</i> | Accepted video bid response protocols as defined in OpenRTB, for example, [2,5] |

5.7.5 Native Asset Data Object

Table 5.22: Native Asset Data Object

| Value | Type | Description |
|-------------|----------------|--|
| <i>type</i> | <i>integer</i> | Data asset type as described in OpenRTB Native specification, for example, 1 |
| <i>len*</i> | <i>integer</i> | Maximum length of the text in the element's response, for example, 25 |

5.8 Device Object Properties

Note: Fields marked with an asterisk (*) are optional.

Table 5.23: Device Object Properties

| Value | Type | Description |
|------------------------|----------------|---|
| <i>geo</i> | <i>object</i> | Geo Object as derived from the device's location services, or supplied by the Supplier if the device IP is missing. For more information, see the <i>Geo Object Properties</i> (page 43) section. |
| <i>ip*</i> | <i>string</i> | IPv4 address closest to the device. Bids containing invalid IP addresses will be discarded. The field is optional for in-app traffic, for example, 87.224.77.0 |
| <i>ua*</i> | string | Browser or application user agent string, for example, "Mozilla/5.0 (Windows NT 6.3; WOW64; rv:35.0) Gecko/20100101Firefox/35.0" |
| <i>language*</i> | <i>string</i> | Alpha-2/ISO 639-1 code of browser language, for example, en |
| <i>carrier*</i> | <i>string</i> | Carrier or ISP derived from the IP address, for example, WIFI |
| <i>connectiontype*</i> | <i>integer</i> | Connection type as defined in OpenRTB, for example, 2 |
| <i>didsha1*</i> | <i>string</i> | Hardware device ID (e.g., IMEI); hashed via SHA1, for example, CCF6DC12B98AEB2346AFE1BEE7860DF01FDE158B |
| <i>didmd5*</i> | string | Hardware device ID (e.g., IMEI); hashed via MD5. 93D05D4D69DEE2BC6645D9F0A0C1938C |
| <i>dpidsha1*</i> | <i>string</i> | Platform device ID (e.g., Android ID); hashed via SHA1, for example, CCF6DC12B98AEB2346AFE1BEE7860DF01FDE158B |
| <i>dpidmd5*</i> | string | Platform device ID (e.g., Android ID); hashed via MD5, for example, 93D05D4D69DEE2BC6645D9F0A0C1938C |

Table 5.24: Device Object Properties

| Value | Type | Description |
|---------------------|----------------|--|
| <i>ifa</i> * | <i>string</i> | Native identifier for advertisers. An ID assigned by the device or browser for use as an advertising identifier, for example Apple's IDFA or Android's Advertising ID. The Apple IDFA is usually uppercase, and the Android Advertiser ID is usually lowercase. For example, <ul style="list-style-type: none"> • Android "035911ea-467d-4056-903b-65cf44f5633b" • iOS "AAAAAAAAA-BBBB-CCCC-1111-222222220000" |
| <i>make</i> * | <i>string</i> | Device make, for example, Apple |
| <i>model</i> * | <i>string</i> | Device mode, for example, iPhone |
| <i>os</i> | <i>string</i> | Device operating system, for example, iOS |
| <i>osv</i> * | <i>string</i> | Device operating system version, for example, 3.1.2 |
| <i>w</i> * | <i>integer</i> | Physical height of the screen in pixels, for example, 750 |
| <i>h</i> * | <i>integer</i> | Physical width of the screen in pixels, for example, 1334 |
| <i>pxratio</i> * | <i>float</i> | The ratio of physical pixels to device independent pixels, for example, 1.0 |
| <i>dnt</i> * | <i>integer</i> | Do not track. <ul style="list-style-type: none"> • 0: do not track is set to false • 1: do not track is set to true in the browser, for example, 0 |
| <i>lmt</i> * | <i>integer</i> | Limit Ad Tracking. Signal commercially endorsed (e.g., iOS, recommended Android): <ul style="list-style-type: none"> • 0: tracking is unrestricted, • 1: tracking must be limited per commercial guidelines, for example, 0 |
| <i>devicetype</i> * | <i>integer</i> | Device type as defined by OpenRTB, for example, 4 |
| <i>ipv6</i> * | <i>string</i> | IP address in IPv6, for example, fe80:0:0:0:200:f8ff:fe21:67cf |
| <i>js</i> * | <i>integer</i> | 1 if the device supports JavaScript; otherwise 0 . |
| <i>flashver</i> * | <i>string</i> | Flash version detected, for example, 10.1 |

5.9 Geo Object Properties

The information provided in the Geo Object is based on [MaxMind database](https://www.maxmind.com/en/geoip2-services-and-databases)¹⁹, except latitude and longitude values.

Note: Fields marked with an asterisk (*) are optional.

¹⁹ <https://www.maxmind.com/en/geoip2-services-and-databases>

Table 5.25: Geo Object Properties

| Value | Type | Description |
|-------------------|----------------|---|
| <i>lat*</i> | <i>float</i> | Latitude from -90 to 90. South is negative, for example, 52.35 |
| <i>lon*</i> | <i>float</i> | Longitude from -180 to 180. West is negative, for example, 4.9167 |
| <i>type*</i> | <i>integer</i> | Source of location data as defined by OpenRTB, for example, 1 |
| <i>country*</i> | <i>string</i> | Country using ISO-3166-1 ²⁰ Alpha-2, for example NL |
| <i>region*</i> | <i>string</i> | Region using ISO-3166-2 or FIPS region codes, for example, 07 |
| <i>city*</i> | <i>string</i> | City name as provided by MaxMind, for example, Alkmaar |
| <i>zip*</i> | <i>string</i> | Zip/postal code, for example, "90210" |
| <i>utcoffset*</i> | <i>integer</i> | Local time as the number +/- of minutes from UTC, for example, -240 |

5.9.1 Geo Object Example

```
{
  "geo": {
    "country": "US",
    "region": "NY",
    "city": "White Plains",
    "zip": "10601",
    "utcoffset": -240
  }
}
```

5.10 User Object

Note: Fields marked with asterisk (*) are optional.

²⁰ http://www.iso.org/iso/home/standards/country_codes.htm

Table 5.26: User Object Properties

| Value | Type | Description |
|------------------|-------------------------|--|
| <i>id*</i> | <i>string</i> | Unique BidSwitch ID of this user, for example, 252eb154-b3e5-473f-bad8-9b6d7f8646e5. |
| <i>buyeruid*</i> | <i>string</i> | The Buyer user ID as mapped by BidSwitch for the DSP. For in-app traffic the lowercase IDFA, or Android ID is used. For example, 38f72eaf-5d6f-4143-824f-deaf753d7239 |
| <i>keywords*</i> | <i>string</i> | Comma separated list of keywords, interests, or intent, for example, Cars, sports, vacation |
| <i>yob*</i> | <i>integer</i> | Year of birth as a 4-digit integer, for example, 1977 |
| <i>gender*</i> | <i>string</i> | Specifies the user gender, for example, "F" <ul style="list-style-type: none"> • "M" = Male • "F" = Female • "0" = Known to be other, or omitted if unknown |
| <i>data*</i> | <i>array of objects</i> | Additional data. Each data object represents a different data source, for more information, see the <i>Data Object</i> (page 53) section. |
| <i>ext*</i> | <i>object</i> | For more information, see the <i>User Ext Object Properties</i> (page 45) section. |

5.10.1 User Ext Object Properties

Table 5.27: User Ext Object Properties

| Value | Type | Description |
|--------------------|----------------|--|
| <i>ug</i> | <i>integer</i> | User group set up for the target user during cookie syncing, for example 1. This takes the following values: <ul style="list-style-type: none"> • 0: unmatched user • 1: matched user • 2-6: custom user group. |
| <i>cookie_age*</i> | <i>integer</i> | Number of days since the user cookie has been dropped, for example, 10 |

5.10.2 User Object Example

```
{
  "user":{
    "id":"45asdf987656789adfad4678rew656789",
    "buyeruid":"1234567890",
    "keywords":"sports, entertainment",
    "yob":1976,
    "gender":"F",
```

```

    "ext":{
      "ug":1,
      "cookie_age":15
    }
  }
}

```

5.11 Site Object

Note: Fields marked with an asterisk (*) are optional.

Table 5.28: Site Object Properties

| Value | Type | Description |
|------------------------|-------------------------|---|
| <i>publisher</i> | <i>object</i> | Publisher object, for more information, see the <i>Publisher Object</i> (page 51) section. |
| <i>id</i> * | <i>string</i> | An exchange specific identifier comprised of the Supplier's exchange name, and the target site ID appended following an underscore. For example, if a Supplier such as Rubicon sends a bid request for site ID "123", the field becomes "rubicon_123" |
| <i>name</i> * | <i>string</i> | Site name (may be masked by publisher request), for example, "Test Site" |
| <i>domain</i> * | <i>string</i> | Domain of the site, used for advertiser side blocking. "testsite.com" |
| <i>cat</i> * | <i>array of strings</i> | Array of IAB content categories for the site. ["IAB1", "IAB2-3"] |
| <i>page</i> * | <i>string</i> | URL of the page where the impression will be shown. "http://testsite.com/main.asp" |
| <i>ref</i> * | <i>string</i> | Referrer URL that caused navigation to the current page, for example, "http://testsite.com/main.asp" |
| <i>privacypolicy</i> * | <i>integer</i> | Indicates if the site has a privacy policy. <ul style="list-style-type: none"> • 0 = No • 1 = Yes. |
| <i>mobile</i> * | <i>integer</i> | Mobile-optimized signal. <ul style="list-style-type: none"> • 0 = No • 1 = Yes. |

5.11.1 Site Object Example

```
{
  "site":{
    "id":"SSPid_1345135123",
    "name":"Site ABCD",
    "domain":"siteabcd.com",
    "cat":[
      "IAB2-1",
      "IAB2-2"
    ],
    "page":"http://siteabcd.com/page.htm",
    "ref":"http://referringsite.com/referringpage.htm",
    "privacypolicy":1,
    "publisher":{
      "id":"SSPid_12345",
      "name":"Publisher A"
    }
  }
}
```

5.12 App Object

Note: Fields marked with an asterisk (*) are optional.

Table 5.29: App Object Properties

| Value | Type | Description |
|-----------------------|-------------------------|---|
| <i>publisher</i> | <i>object</i> | Publisher object, for more information, see the <i>Publisher Object</i> (page 51) section. |
| <i>id*</i> | <i>string</i> | The application ID prefixed with the exchange name followed by an underscore. For example, if Rubicon sends a bid request for App ID “123”, the field becomes "rubicon_123" |
| <i>name*</i> | <i>string</i> | Application name, for example, "Test App" |
| <i>domain*</i> | <i>string</i> | The domain of the app, for example, "mygame.example.com" |
| <i>cat*</i> | <i>array of strings</i> | Array of IAB content categories for the publisher site, for example, ["IAB1", "IAB2- 3"] |
| <i>bundle*</i> | <i>string</i> | Application bundle or package name, for example, "com.example.mygame" |
| <i>paid*</i> | <i>integer</i> | Specifies if the App is a free or paid version. <ul style="list-style-type: none"> • 0 = The app is free, • 1 = The app is a paid version. |
| <i>storeurl*</i> | <i>string</i> | App store’s URL for the mobile application, for example "http://media-apps.cc/android" |
| <i>ver*</i> | <i>string</i> | Application version, for example "1.1" |
| <i>privacypolicy*</i> | <i>integer</i> | Indicates if the app has a privacy policy. <ul style="list-style-type: none"> • 0 = No • 1 = Yes. |

5.13 TV Object

Table 5.30: TV Object Properties

| Value | Type | Description |
|------------------|---------------|--|
| <i>publisher</i> | <i>object</i> | Publisher object, for more information, see the <i>Publisher Object</i> (page 51) section. |

5.14 DOOH Object

Table 5.31: DOOH Object Properties

| Value | Type | Description |
|------------------|---------------|--|
| <i>publisher</i> | <i>object</i> | Publisher object, for more information, see the <i>Publisher Object</i> (page 51) section. |

5.15 Private Marketplace Object

Note: Fields marked with an asterisk (*) are optional.

Table 5.32: Private Marketplace Object Properties

| Value | Type | Description |
|-------------------------|-------------------------|--|
| <i>private_auction*</i> | <i>integer</i> | A value of 1 indicates that only bids submitted inside <code>pmp.deals</code> will take part in the auction. A value of 0 indicates that bids without deal information may also be considered for serving. |
| <i>deals</i> | <i>array of objects</i> | Array of Deal objects., for more information, see the <i>Deal Object</i> (page 49) section. |

5.15.1 Private Marketplace Object Example

```
{
  "pmp":{
    "private_auction":1,
    "deals":[
      {
        "id":"deal-1",
        "wseat":[
          "58"
        ],
        "bidfloor":2.5,
        "at":1
      },
      {
        "id":"deal-2",
        "bidfloor":2,
        "at":2
      }
    ]
  }
}
```

5.16 Deal Object

Note: Fields marked with an asterisk (*) are optional.

Table 5.33: Deal Object Properties

| Value | Type | Description |
|---------------------|-------------------------|--|
| <i>id</i> | <i>string</i> | Deal id, for example, "AA-1234" |
| <i>wseat*</i> | <i>array of strings</i> | <p>Array of Buyer seats allowed to bid on this Direct Deal, for example, [58, 99]. If present, the allowed seat IDs may be supplied using the BidSwitch or Supplier taxonomy.</p> <ul style="list-style-type: none"> • The BidSwitch taxonomy uses the Buyer ID as the single seat ID value. • The seat in the Supplier taxonomy may represent the whole Buyer or some entity on the Buyer side (e.g. agency) • A bid request may contain multiple seat IDs in the Supplier taxonomy. • The bid response should contain the appropriate seat value corresponding to one of values of the <i>wseat</i> field, see the <i>Seat Bid Object</i> (page 74) section. |
| <i>bidfloor*</i> | <i>float</i> | Deal price in CPM. If <i>deal.at</i> = 3 then this is the exact price of the deal, otherwise this is the bid floor of the deal, for example, 1.3 |
| <i>bidfloorcur*</i> | <i>string</i> | Bid floor currency specified using ISO-4217 ²¹ alpha codes, for example, "USD" |
| <i>at*</i> | <i>integer</i> | <p>Auction type.</p> <ul style="list-style-type: none"> • 1 for first price auction. • 2 for second price auction. • 3 for fixed price deal. |

5.16.1 Deal Object Example

```
{
  "pmp":{
    "private_auction":1,
    "deals":[
      {
        "id":"deal-1",
        "wseat":[
          "58"
        ],
        "bidfloor":2.5,
        "at":1
      },
      {
        "id":"deal-2",
        "bidfloor":2,
```

²¹ http://www.iso.org/iso/home/standards/currency_codes.htm

```

    "at":2
  }
]
}
}

```

5.17 Publisher Object

Table 5.34: Publisher Object Properties

| Value | Type | Description |
|---------------|-----------------|--|
| <i>id</i> | <i>string</i> | An exchange specific identifier comprised of the the Supplier exchange name, and the publisher ID appended following an underscore. For example, if a Supplier such as Rubicon sends the publisher ID "25", then the value of the field becomes rubicon_25. For Google AdX bid requests the Google Seller network ID is used. |
| <i>name</i> * | string | Publisher name, for example "AAP" |
| <i>cat</i> * | array of string | Array of IAB content categories for the publisher. ["IAB1", "IAB2-3"] |

Note: Fields marked with an asterisk (*) are optional and may not be sent in each request.

5.17.1 Publisher Object Example

```

{
  "publisher":{
    "id":"SSPid_12345",
    "name":"Publisher A"
  }
}

```

5.18 Ext Object

Note: Fields marked with an asterisk (*) are optional.

Table 5.35: Ext Object Properties

| Value | Type | Description |
|-------------------|----------------|--|
| <i>ssp</i> | <i>string</i> | The Supplier identification string, for example "rubicon" |
| <i>google*</i> | <i>object</i> | <i>Google Object</i> (page 52). This field is optional and is used only in Google AdX bid requests. |
| <i>gumgum*</i> | <i>object</i> | <i>Gumgum Object</i> (page 53). This field is optional and is used only in Gumgum bid requests. |
| <i>adtruth*</i> | <i>object</i> | <i>Adtruth Object</i> (page 53). This field is optional and is present if the corresponding data is provided by the Supplier. |
| <i>tv*</i> | <i>object</i> | <i>TV Object</i> (page 48) describing the programmatic TV. Either site, app, ext.dooh or ext.tv object should be present. |
| <i>dooh*</i> | <i>object</i> | <i>DOOH Object</i> (page 48) describing the Digital Out Of Home inventory. Either site, app, ext.dooh or ext.tv object should be present. |
| <i>clktrkrq*</i> | <i>integer</i> | 1 for bid requests that require click tracking macro in the bid response, 0 otherwise. |
| <i>s2s_nurl*</i> | <i>integer</i> | 1 for bid requests that imply server-to-server win notifications in case of a won auction. This implies that the bid response cannot contain <code>adm</code> field with a price macro, see the <i>5.x Updating Overview</i> (page 18) section for more information. |
| <i>is_secure*</i> | <i>integer</i> | 0 for non-secure pages; 1 for secure pages. Creatives for secure pages should be SSL-compliant. Deprecated since version 2.6: Use <code>imp.secure</code> instead, see <i>Impression Object</i> (page 24). |

5.18.1 Google Object

Table 5.36: Google Object Properties

| Value | Type | Description |
|---------------------------|-------------------------|---|
| <i>detected_vertical*</i> | <i>array of objects</i> | List of detected vertical values as defined by Google, see <i>Detected_vertical Object</i> (page 52). |

5.18.2 Detected_vertical Object

Table 5.37: Detected Vertical Object Properties

| Value | Type | Description |
|--------|---------|--|
| id | integer | The vertical id as defined by AdX docs, for example, 1014 |
| weight | float | Weight for this vertical, in the (0.0, 1.0] range. More relevant verticals have higher weights, for example, 1.0 |

5.18.3 Adtruth Object

Table 5.38: Adtruth Object Properties

| Value | Type | Description |
|---------------------|--------|--|
| <i>tdl_millis*</i> | int64 | Time Difference Linking (TDL), which allows for differentiation between similarly configured devices that might share a DeviceInsight identifier, for example, 19534993 |
| RECIPE VERSION_x | string | The specific AdTruth device identification recipe version and the corresponding DeviceInsight identifier. There might be multiple AdTruth recipe versions, for example, "WEB_APP_BRIDGE_4_0": "4FD87B97751E9C305FD2AF1AA2D3" |

5.18.4 Gumgum Object

Table 5.39: Gumgum Object Properties

| Value | Type | Description |
|------------|------------------------|---|
| <i>cat</i> | <i>array of string</i> | Site or application category in Gumgum taxonomy, for example, ["GGE23-1", "GGE22"]. The full taxonomy can be found in this Google doc ²² |

5.19 Regulation Object

Table 5.40: Regulation Object Properties

| Value | Type | Description |
|--------------|----------------|---|
| <i>coppa</i> | <i>integer</i> | Flag indicating whether or not this request falls under the COPPA regulations established by the USA FTC, <ul style="list-style-type: none"> • 0 = No. • 1 = Yes. |

5.20 Data Object

Note: Fields marked with asterisk (*) are optional.

²² <https://docs.google.com/spreadsheets/d/1qt3thvCHjpDzdpybpwNySkB8LnmEjvCyQrJKH6MYQio/export?format=csv&id=1qt3thvCHjpDzdpybpwNySkB8LnmEjvCyQrJKH6MYQio&gid=0>

Table 5.41: Data Object Properties

| Value | Type | Description |
|----------------|-------------------------|--|
| <i>id</i> * | <i>string</i> | Exchange-specific ID for the data provider, for example "BSW001" |
| <i>name</i> | <i>string</i> | Exchange-specific name for the data provider, for example "domain-origin" |
| <i>segment</i> | <i>array of objects</i> | Array of Segment objects that contain the actual data values, see <i>Segment Object</i> (page 54). |

5.20.1 Segment Object

Table 5.42: Segment Object Properties

| Value | Type | Description |
|----------------|---------------|---|
| <i>id</i> * | string | ID of the data segment specific to the data provider, for example, "Seg123" |
| <i>name</i> | string | Name of the data segment specific to the data provider, for example, "status" |
| <i>value</i> * | <i>string</i> | String representation of the data segment value, for example, "verified" |

```

{
  "data": [
    {
      "name": "domain-origin",
      "segment": [
        {
          "name": "status",
          "value": "verified"
        },
        {
          "name": "domain",
          "value": "abcd.com"
        }
      ]
    }
  ]
}

```

5.21 Bid Request JSON Examples

- *Banner Ad Example* (page 55)
- *In App Example* (page 57)
- *Native Ad* (page 59)

- *Private Deal Example* (page 62)
- *Video Example* (page 64)
- *Audio Ad Example* (page 66)
- *TV Ad Example* (page 68)
- *DOOH Ad Example* (page 70)

5.21.1 Banner Ad Example

```
{
  "id": "c6987c2b-edb4-4b7b-b8cf-157af1d485e3",
  "site": {
    "id": "gumgum_www.answers.com_ed2265d8",
    "ref": "http://ad32.answers.com/click.php?source=fb&param4=fb-us-de-red&param3=www.
↔answers.com%2Farticle%2F31029589%2Finsanely-useful-life-hacks-to-make-everything-
↔easier&param1=tattoo&param2=67660042&param5=10153631993521186&param6=6049542139960&
↔adt=4342",
    "publisher": {
      "name": "www.answers.com",
      "id": "gumgum_946353442_12535"
    },
    "name": "www.answers.com",
    "cat": [
      "IAB24"
    ],
    "domain": "answers.com",
    "ext": {
    },
    "page": "http://www.answers.com/article/31029589/insanely-useful-life-hacks-to-make-
↔everything-easier?paramt=null&param4=fb-us-de-red&param1=tattoo&param2=67660042&s=8"
  },
  "wseat": [
    "165",
    "16"
  ],
  "user": {
    "id": "5e29eb00-c30a-416e-9d2a-2e18901f0916",
    "ext": {
      "cookie_age": 64
    },
    "buyeruid": "CAESEHL-904oJOAiC1Y002EHTcE"
  },
  "device": {
    "pxratio": 0,
    "language": "en",
    "w": 1920,
    "geo": {
      "country": "US",
      "lon": -80.237,

```

```

    "city":"West Palm Beach",
    "lat":26.638,
    "zip":"33414",
    "region":"FL",
    "type":2
  },
  "os":"Windows",
  "devicetype":2,
  "h":1080,
  "ip":"73.139.39.18",
  "js":1,
  "ua":"Mozilla/5.0 (Windows NT 6.1; WOW64; rv:47.0) Gecko/20100101 Firefox/47.0",
  "dnt":0
},
"tmax":75,
"cur":[
  "USD"
],
"imp":[
  {
    "bidfloor":3.213,
    "id":"1",
    "banner":{
      "pos":1,
      "h":600,
      "battnum":[
        1,
        3,
        5,
        6,
        8,
        9,
        10,
        14,
        15,
        16
      ],
      "w":160,
      "format":[
        {
          "h":300,
          "w":300
        },
        {
          "h":350,
          "w":300
        }
      ]
    },
    "btype":[
      1
    ]
  },
  "exp":300,

```

```

    "tagid":"gumgum_25108",
    "bidfloorcur":"USD",
    "ext":{
      },
    "secure":0,
    "instl":0
  }
],
"bcat":[
  "IAB25-3",
  "BSW1",
  "BSW2",
  "BSW10",
  "BSW4",
  "IAB26"
],
"ext":{
  "wt":1,
  "clktrkrq":0,
  "is_secure":0,
  "ssp":"gumgum"
},
"at":2
}

```

5.21.2 In App Example

```

{
  "regs":{
    "coppa":0
  },
  "id":"4ecfe2ab-c275-48fb-8c0b-c7103579eaa0",
  "app":{
    "id":"adaptv_",
    "publisher":{
      "name":"",
      "id":"adaptv_11690"
    },
    "storeurl":"https://play.google.com/store/apps/details?id=com.zynga.looney",
    "bundle":"com.zynga.looney",
    "cat":[
      "IAB1"
    ],
    "name":"looney tunes dash!"
  },
  "wseat":[
    "68"
  ],
  "user":{
    "id":"dfc68ac9-9530-44b0-bdea-44cf153d7cea",

```

```

    "ext":{
      "ug":1
    }
  },
  "device":{
    "dpidsha1":"0d7e6f65e1db717f0ed298bd268cc6415fa72124",
    "language":"en",
    "geo":{
      "country":"US",
      "lon":-78.83,
      "city":"Hamburg",
      "lat":42.71,
      "zip":"14075",
      "region":"NY",
      "type":2
    },
    "ifa":"dfc68ac9-9530-44b0-bdea-44cf153d7cea",
    "lmt":0,
    "os":"android",
    "devicetype":4,
    "ip":"72.88.84.159",
    "ua":"Mozilla/5.0 (Linux; Android 6.0.1; SM-G920P Build/MMB29K; wv) AppleWebKit/
↔537.36 (KHTML, like Gecko) Version/4.0 Chrome/51.0.2704.81 Mobile Safari/537.36",
    "dpidmd5":"c65cf7c5bffe94c62cf20c5e465d92f7"
  },
  "tmax":120,
  "cur":[
    "USD"
  ],
  "imp":[
    {
      "bidfloor":0.02268,
      "id":"1",
      "instl":0,
      "exp":300,
      "bidfloorcur":"USD",
      "ext":{

      },
      "secure":0,
      "video":{
        "protocols":[
          2,
          5
        ],
        "minduration":5,
        "playbackmethod":[
          1
        ],
        "maxduration":30,
        "startdelay":0,
        "linearity":1,
        "mimes":[

```

```

        "video/mp4"
      ]
    }
  ],
  "bcat": [
    "IAB25-3",
    "BSW1",
    "BSW2",
    "BSW10",
    "BSW4",
    "IAB26"
  ],
  "ext": {
    "is_secure": 0,
    "wt": 1,
    "clktrkrq": 0,
    "ssp": "adaptv"
  },
  "at": 2
}

```

5.21.3 Native Ad

```

{
  "id": "129ca6dd-5403-4476-a4a6-555d6a538bc4",
  "app": {
    "id": "pubnative_1009429",
    "publisher": {
      "name": "",
      "id": "pubnative_1005292"
    },
    "storeurl": "https://play.google.com/store/apps/details?id=com.leo.appmaster",
    "bundle": "com.leo.appmaster",
    "cat": [
      "IAB3"
    ],
    "name": "PG_lock_pic"
  },
  "wseat": [
    "167"
  ],
  "user": {
    "id": "793ff4b0-d077-4002-aeb6-b8ea64dd4b2b",
    "ext": {
      "ug": 1
    }
  },
  "device": {
    "connectiontype": 3,
    "model": "Micromax A096",
  }
}

```



```

"language":"en",
"geo":{
  "country":"IN",
  "lon":85.1167,
  "city":"Patna",
  "lat":25.6,
  "zip":"800002",
  "region":"34",
  "type":2
},
"ifa":"793ff4b0-d077-4002-aeb6-b8ea64dd4b2b",
"osv":"5.0.2",
"os":"Android",
"carrier":"Airtel",
"devicetype":1,
"ip":"223.176.12.242",
"ua":"Dalvik/2.1.0 (Linux; U; Android 5.0.2; Micromax A096 Build/LRX21M)",
"dnt":2
},
"tmax":80,
"cur":[
  "USD"
],
"imp":[
  {
    "bidfloor":0.324,
    "id":"1",
    "native":{
      "request":{
        "plcmcnt":1,
        "assets":[
          {
            "id":1,
            "data":{
              "type":12
            },
            "required":1
          },
          {
            "title":{
              "len":50
            },
            "id":2,
            "required":1
          },
          {
            "id":3,
            "img":{
              "w":80,
              "h":80,
              "type":1
            },
            "required":1
          }
        ]
      }
    }
  }
]

```

```

        },
        {
            "id":4,
            "img":{
                "w":1200,
                "h":627,
                "type":3
            },
            "required":1
        },
        {
            "data":{
                "type":3
            },
            "id":5,
            "required":0
        },
        {
            "id":6,
            "data":{
                "len":100,
                "type":2
            },
            "required":1
        }
    ],
    "ver":1
}
},
"exp":1800,
"bidfloorcur":"USD",
"ext":{

},
"instl":0
}
],
"bcat":[
    "IAB25-3",
    "BSW1",
    "BSW2",
    "BSW10",
    "BSW4",
    "IAB26"
],
"ext":{
    "wt":2463.818181818182,
    "clktrkrq":0,
    "ssp":"pubnative",
    "s2s_nurl":1
},
"at":2
}

```

5.21.4 Private Deal Example

```

{
  "id":"500da108-85f8-44af-ac98-d7adcf9e0daf",
  "site":{
    "id":"spotx_SpotX_www.businessinsider.com",
    "publisher":{
      "name":"",
      "id":"spotx_84548"
    },
    "domain":"businessinsider.com",
    "ext":{

    },
    "page":"https://www.businessinsider.com/japanese-potato-changed-olivia-munns-
↪appearance-2016-2"
  },
  "wseat":[
    "145"
  ],
  "pmp":{
    "private_auction":1,
    "deals":[
      {
        "bidfloor":10.8,
        "id":"14a44.a7993.d401",
        "bidfloorcur":"USD",
        "at":2
      }
    ]
  },
  "user":{
    "ext":{
      "ug":0
    }
  },
  "device":{
    "dpidsha1":"",
    "model":"Chrome - Windows",
    "language":"en",
    "geo":{
      "country":"US",
      "city":"Jackson Heights",
      "region":"NY",
      "zip":"11372"
    },
    "make":"Google",
    "osv":"NT 6.1",
    "os":"Windows 7",
    "devicetype":2,
    "ip":"98.14.26.33",
    "ua":"Mozilla/5.0 (Windows NT 6.1) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/
↪43.0.2342.0 Safari/537.36",

```

```

    "dpidmd5": "",
    "dnt": 0
  },
  "tmax": 415,
  "cur": [
    "USD"
  ],
  "imp": [
    {
      "bidfloor": 0.011232,
      "id": "1",
      "pmp": {
        "private_auction": 1,
        "deals": [
          {
            "bidfloor": 10.8,
            "id": "14a44.a7993.d401",
            "bidfloorcur": "USD",
            "at": 2
          }
        ]
      }
    },
    {
      "instl": 0,
      "exp": 300,
      "tagid": "spotx_http://search.spotxchange.com/vast/2.00/149110?VPAID=1&content_
↪type=game&vmaxd=30&player_width=640&player_height=480&content_page_url=http%3A%2F
↪%2Fwww.businessinsider.com%2Fjapanese-potato-changed-olivia-munns-appearance-2016-2&
↪cb=1468903661330&adtid=T6GDD32DDC8UD500S5I6QROV40&viewability=0",
      "bidfloorcur": "USD",
      "ext": {

    },
    "secure": 0,
    "video": {
      "protocols": [
        2,
        5
      ],
      "companiontype": [
        1,
        2,
        3
      ],
      "minduration": 1,
      "maxduration": 60,
      "startdelay": 0,
      "api": [
        1
      ],
      "linearity": 1,
      "h": 480,
      "delivery": [
        2
      ]
    }
  ]
}

```

```

    ],
    "ext":{
      "player_type":3
    },
    "mimes":[
      "video/x-flv",
      "video/mp4",
      "application/x-shockwave-flash"
    ],
    "w":640,
    "companionad":[
      {
        "h":250,
        "id":"1",
        "w":300
      }
    ]
  }
],
"bcat":[
  "IAB25-3",
  "BSW1",
  "BSW2",
  "BSW10",
  "BSW4",
  "IAB26"
],
"ext":{
  "is_secure":0,
  "wt":1,
  "clktrkrq":0,
  "ssp":"spotx"
},
"at":2
}

```

5.21.5 Video Example

```

{
  "regs":{
    "coppa":0
  },
  "id":"75c0238c-3b52-4b87-957a-817f83e853f1",
  "site":{
    "id":"adaptv_",
    "publisher":{
      "name":"",
      "id":"adaptv_4182"
    }
  },
  "cat":[

```

```

    "IAB1"
  ],
  "ext":{

  },
  "page":"http://kissasian.com"
},
"wseat":[
  "126"
],
"user":{
  "id":"b457c658-ffdc-415c-8d91-30d864f4a5f5",
  "ext":{
    "cookie_age":153,
    "ug":1
  },
  "buyeruid":"7bcb7e7c-eff0-43ad-8522-b5c9251f0d43"
},
"device":{
  "language":"en",
  "geo":{
    "country":"US",
    "lon":-75.15,
    "city":"Philadelphia",
    "lat":39.94,
    "zip":"19147",
    "region":"PA",
    "type":2
  },
  "lmt":0,
  "os":"Other",
  "devicetype":6,
  "ip":"73.141.79.240",
  "ua":"Mozilla/5.0 (PlayStation 4 3.55) AppleWebKit/537.78 (KHTML, like Gecko)"
},
"tmax":120,
"cur":[
  "USD"
],
"imp":[
  {
    "bidfloor":0.02268,
    "id":"1",
    "instl":0,
    "exp":300,
    "bidfloorcur":"USD",
    "ext":{

    },
    "secure":0,
    "video":{
      "protocols":[
        2,

```

```

        5
      ],
      "minduration":5,
      "playbackmethod":[
        3
      ],
      "maxduration":60,
      "startdelay":0,
      "linearity":1,
      "mimes":[
        "video/mp4"
      ]
    }
  }
],
"bcat":[
  "IAB25-3",
  "BSW1",
  "BSW2",
  "BSW10",
  "BSW4",
  "IAB26"
],
"ext":{
  "wt":1,
  "clktrkrq":0,
  "is_secure":0,
  "ssp":"adaptv",
  "s2s_nurl":1
},
"at":2
}

```

5.21.6 Audio Ad Example

```

{
  "id":"1234534625253",
  "wseat":[
    "58"
  ],
  "imp":[
    {
      "id":"1",
      "secure":1,
      "audio":{
        "id":"1",
        "bidfloor":0.03,
        "audio":{
          "startdelay":0,
          "minduration":5,
          "maxduration":30,

```

```
"maxextended":30,
"minbitrate":300,
"maxbitrate":1500,
"api":[
  1,
  2
],
"protocols":[
  9,
  10
],
"mimes":[
  "audio/aac",
  "audio/mp4",
  "audio/mpeg"
],
"delivery":[
  2
],
"battr":[
  13,
  14
],
"companionad":[
  {
    "id":"1234567893-1",
    "w":300,
    "h":250,
    "pos":1,
    "battr":[
      13,
      14
    ],
    "expdir":[
      2,
      4
    ]
  },
  {
    "id":"1234567893-2",
    "w":728,
    "h":90,
    "pos":1,
    "battr":[
      13,
      14
    ]
  }
],
"companiontype":[
  1,
  2
]
```



```

    }
  }
},
"site":{
  "id":"google_234563",
  "domain":"siteabcd.com",
  "page":"https://siteabcd.com/page.htm",
  "ref":"http://google.com/?q=siteabcd",
  "publisher":{
    "id":"google_25"
  }
},
"device":{
  "ip":"64.124.253.1",
  "geo":{
    "country":"US",
    "region":"NY",
    "city":"White Plains",
    "zip":"10601"
  },
  "ua":"Mozilla/5.0 (Macintosh; U; Intel Mac OS X 10.6; en-US; rv:1.9.2.16) Gecko/
↪20110319 Firefox/3.6.16",
  "language":"en"
},
"user":{
  "id":"45asdf987656789adfad4678rew656789",
  "buyeruid":"1234567890",
  "ext":{
    "ug":1
  }
},
"cur":[
  "USD"
],
"ext":{
  "ssp":"google"
}
}

```

5.21.7 TV Ad Example

```

{
  "id":"1234534625253",
  "wseat":[
    "58"
  ],
  "imp": [
    {
      "id": "1",
      "bidfloor": 15,

```

```

    "exp": 360,
    "video": {
      "mimes": [
        "video/x-flv",
        "video/mp4",
        "application/x-shockwave-flash",
        "application/javascript"
      ],
      "minduration": 30,
      "maxduration": 30,
      "protocols": [
        3,
        6
      ]
    }
  ],
  "device": {
    "geo": {
      "country": "US",
      "region": "TX"
    },
    "devicetype": 6
  },
  "user": {
    "id": "45asdf987656789adfad4678rew656789",
    "keywords": "A_18_24, COLLEGE, HHI_75_100, M_18_24, HH_SINGLE",
    "data": [
      {
        "name": "program_types",
        "segment": [
          {
            "name": "HOCKEY_DEC",
            "value": "8"
          },
          {
            "name": "BASEBALL_DEC",
            "value": "9"
          },
          {
            "name": "FOOTBALL_DEC",
            "value": "8.1"
          }
        ]
      }
    ]
  },
  "tmax": 150,
  "cur": "USD",
  "ext": {
    "ssp": "dish",
    "tv": {
      "publisher": {

```

```

    "id": "dish_"
  }
}
}
}

```

5.21.8 DOOH Ad Example

```

{
  "id": "1234534625253",
  "wseat": [
    "58"
  ],
  "imp": [
    {
      "id": "06d690d1-bac0-43fa-9257-f6d62d984231",
      "bidfloor": 15,
      "exp": 360,
      "video": {
        "mimes": [
          "video/x-flv",
          "video/mp4"
        ],
        "minduration": 30,
        "maxduration": 30,
        "protocols": [
          3,
          6,
          7
        ],
        "w": 640,
        "h": 480
      },
      "pmp": {
        "private_auction": 1,
        "deals": [
          {
            "id": "deal-1",
            "wseat": [
              "58"
            ],
            "bidfloor": 2.5,
            "bidfloorcur": "USD",
            "at": 3
          }
        ]
      }
    }
  ],
  "device": {
    "ifa": "035911ea467d03b65cf44f5633b",

```

```

    "ip": "64.124.253.1",
    "geo": {
      "lat": 35.012344,
      "lon": -115.12345,
      "country": "US",
      "region": "NY",
      "city": "White Plains",
      "zip": "10601"
    },
    "devicetype": 6
  },
  "user": {
    "id": "45asdf987656789adfad4678rew656789",
    "data": [
      {
        "id": "6",
        "name": "Data Provider 1",
        "segment": [
          {
            "name": "M",
            "value": "15"
          },
          {
            "name": "F",
            "value": "9"
          },
          {
            "name": "M65+",
            "value": "8.1"
          }
        ]
      }
    ],
    {
      "name": "demographic",
      "segment": [
        {
          "id": "12341318394918",
          "name": "auto intenders"
        }
      ]
    }
  ],
  "tmax": 150,
  "exp": 300,
  "cur": "USD",
  "ext": {
    "ssp": "broadsign",
    "dooh": {
      "publisher": {
        "id": "broadsign_234563",
        "cat": [
          "IAB1"
        ]
      }
    }
  }
}

```

```
    ]  
  }  
},  
  "s2s_nurl": 1  
}  
}
```

CHAPTER 6

BID RESPONSE

This is the top level object that is returned by the Buyer. Each bid response sent from the Buyer to BidSwitch should contain the following fields.

Note: Fields marked with an asterisk (*) are optional.

Bid responses for in-app inventory match banner or video response formats.

Table 6.1: Bid Response Object Properties

| Value | Type | Description |
|----------------|-------------------------|---|
| <i>id</i> | <i>string</i> | Specifies the ID of the bid request to which this is a response to, for example, "d7d1e107-fe7c-4a57-9592-d1d41fa702d9" |
| <i>seatbid</i> | <i>array of objects</i> | An array of Seat Bid objects, see the <i>Seat Bid Object</i> (page 74) section. The length of the array can be either 1+ (for yes-bid) or 0 (for no-bid). |
| <i>cur</i> * | <i>string</i> | Sets the bidding currency using ISO-4217 ²³ alphabetic codes. If not provided USD is assumed, "USD" |
| <i>ext</i> | <i>object</i> | The bid response extension object. This field may be omitted in No Bid Responses, see the <i>Bid Response Ext Object</i> (page 74) section. |

²³ http://www.iso.org/iso/home/standards/currency_codes.htm

6.1 Bid Response Ext Object

Table 6.2: Bid Response Ext Object Properties

| Value | Type | Description |
|-----------------|---------------|--|
| <i>protocol</i> | <i>string</i> | The latest BidSwitch protocol version this bid response is compliant with, for example "5.1" |

```
{
  "id": "1234567890",
  "ext": {
    "protocol": "5.1"
  },
}
```

6.2 Seat Bid Object

Formally there can be multiple bids within the Seat Bid object for two reasons.

- There can be several slots in each request.
- When there is more than one bid for a single slot.

BidSwitch allows no more than two bids for a single ad slot. Bids belonging to the same seat must be in the same `seatbid.bid` array, i.e. all `seatbid.seat` values must be unique per response.

Table 6.3: Seat Bid Object Properties

| Value | Type | Description |
|-------------|-------------------------|--|
| <i>bid</i> | <i>array of objects</i> | Array of Bid Objects, see <i>Bid Object</i> (page 75). The maximum number of bid objects per single bid request ad slot is two. |
| <i>seat</i> | <i>string</i> | ID of the bidder seat on whose behalf this bid is made. The value should match one of the values supplied in <code>wseat</code> field in the bid request. "34" |

6.3 Bid Object

Table 6.4: Bid Object Properties

| Value | Type | Description |
|--------------|---------------|---|
| <i>id</i> | <i>string</i> | A bidder generated ID for the bid object, used for tracking and debugging purposes, for example 3. |
| <i>impid</i> | <i>string</i> | The ID of the impression object (<i>imp</i>) from the bid request to which this bid response applies, for example "1" |
| <i>price</i> | <i>float</i> | The bid price as a float value, expressed as CPM. All prices assumed to be in USD if the <i>cur</i> parameter is omitted, for example 1.23 |
| <i>adm</i> * | <i>string</i> | <p>Creative markup for banner ads.</p> <ul style="list-style-type: none"> For protocol version 4.x this field should not contain the win price macro. From version 5.x, this field can contain the win price macro unless the bid request contains <code>ext.s2s_nurl</code> field value equal to 1, see the <i>5.x Updating Overview</i> (page 18) section for more information. This field is required for banner ads, and is ignored for video or native bid responses. The <i>adm</i> field is supported from protocol 4.0 onwards, so bid responses containing the <i>adm</i> field but not containing the <code>ext.protocol</code> value of 4.0+ are deemed invalid. <pre> </pre> |
| <i>nurl</i> | <i>string</i> | <p>The win notice URL called if the bid wins.</p> <ul style="list-style-type: none"> This field should not be used for submitting creative markup. The URL can contain the win price macro, see the <i>Macros</i> (page 105) and <i>5.x Updating Overview</i> (page 18) sections. This URL will be mostly called from user's browser and should thus be SSL-compliant for requests with <code>imp.secure</code> set to 1. This URL will be called by a server to server call if the bid request contained <code>ext.s2s_nurl</code> field value equal to 1. <pre>http://adserver.com/winnotice?impid=102&winprice=\$ ↪{AUCTION_PRICE}</pre> <p>Note: This describes the behaviour in version 4.0+, which changed since version 2.x. For more information about the 2.x behaviour, see the <i>nurl Response Difference</i> (page 15) section.</p> |

Table 6.5: Bid Object Properties

| Value | Type | Description |
|----------------|-------------------------------|--|
| <i>iurl*</i> | <i>string</i> | Sample image URL (without cache busting) for content checking. REQUIRED : for banner bid requests. "http://adserver.com/preview?impid=102" |
| <i>adid*</i> | <i>string</i> | ID that references the ad to be served if the bid wins. Either the <i>adid</i> field or <i>crid</i> field should be present in the response, for example "3021" |
| <i>adomain</i> | <i>array of strings</i> | Advertiser's primary or top-level domain for advertiser checking. This can be a list of domains if there is a rotating creative. Note that some Suppliers allow only one domain. To those Suppliers BidSwitch only sends the first domain from the list, for example, ["advertiser.com"] |
| <i>cid*</i> | <i>string</i> | Campaign ID or similar that is used by the Buyer to track and organize their campaigns, for example, 102 Notes : This field is REQUIRED for Rubicon, Nexage, Smaato and MoPub. |
| <i>crid*</i> | <i>string</i> | Creative ID to assist with ad quality checking. Either the <i>adid</i> field or <i>crid</i> field should be present in the response, for example "3021" |
| <i>attr*</i> | <i>array of integers</i> | Creative attributes as defined in the OpenRTB protocol, for example, [1,3]. |
| <i>dealid*</i> | <i>string</i> | Reference to the <i>deal.id</i> from the bid request, if this bid pertains to a private marketplace direct deal, for example, "AA-1234" |
| <i>h*</i> | <i>integer</i> | The height of the creative in pixels when an alternative ad size is used, relevant for banner ads only. 250 |
| <i>w*</i> | <i>integer</i> | The width of the creative in pixels when an alternative ad size is used, relevant for banner ads only. 300 |
| <i>cat*</i> | <i>array of strings</i> ** | The IAB category of the creative. REQUIRED in bid responses to BrightRoll SSP (RMX), MoPub, Smaato and YieldOne bids. If the Supplier only accepts one category in the bid response the first array element will be used, for example, ["IAB1"] |
| <i>ext*</i> | object | This field may be required under certain circumstances, see <i>Bid Ext Object</i> (page 77). |

Note: (**) For backward compatibility, this field can also be a string when using the BidSwitch 4.0 protocol.

6.3.1 Bid Ext Object

Table 6.6: Bid Ext Object Properties

| Value | Type | Description |
|--------------------------|-------------------------|--|
| <i>advertiser_name</i> * | <i>string</i> | The name of the advertiser serving the creative, for example, "Coca-Cola" <ul style="list-style-type: none"> • REQUIRED in bid responses to Ströer (AdScale), Centro, and BRX. • Recommended in responses to YieldOne bids. |
| <i>agency_name</i> * | <i>string</i> | The name of the agency representing the advertiser, for example, "CCA" <p>REQUIRED in bids responses to Ströer (AdScale) bids.</p> |
| <i>agency_id</i> * | <i>string</i> | ID of the agency representing the advertiser, for example, "123" |
| <i>lpdomain</i> * | <i>array of strings</i> | The actual landing page domain of the creative if different from the <code>adomain</code> value. Recommended for mobile application ads, for example: <ul style="list-style-type: none"> • <code>"adomain": ["angrybirds.com"]</code> • <code>"lpdomain": ["play.google.com", "itunes.apple.com"]</code> |
| <i>language</i> * | <i>string</i> | The Alpha-2 ISO 639-1 ²⁴ code for the creative's language, for example, <code>jp</code> . <p>REQUIRED in bid responses to BrightRoll SSP (rmx) and OpenX Japan (CCI) bids.</p> |
| <i>google</i> * | <i>object</i> | Contains additional information for Google bids. This field is recommended. See the <i>Supplier Specific Fields</i> (page 82) section for more details. |
| <i>yieldone</i> * | <i>object</i> | Contains additional information for YieldOne bids. This field is recommended. See the <i>Supplier Specific Fields</i> (page 82) section for more details. |
| <i>vast_url</i> * | <i>string</i> | The URL pointing to the location of the VAST document for bid responses to video traffic, for example, "http://adserver.com/vast?impid=102" <ul style="list-style-type: none"> • This bid response field is required if the <code>video.ext.vast_url_rq</code> bid request field is set to 1. • If the <code>video.ext.vast_url_rq</code> bid request field is set to 0 or missing, you can include the VAST URL in the <code>nurl</code> field. <p>For more information see the <i>Video Ext Object</i> (page 34) section.</p> <p>Note: The VAST document should NOT contain impression tracking URLs with win price macros.</p> |

²⁴ http://www.iso.org/iso/home/standards/language_codes.htm

Table 6.7: Bid Ext Object Properties

| Value | Type | Description |
|-------------------|----------------|---|
| <i>daast_url*</i> | <i>string</i> | The URL pointing to the location of the DAAST document for the bid response, for example, "http://adserver.com/daast?impid=102" REQUIRED for bid responses to audio traffic. Note: that the DAAST document should NOT contain impression tracking urls with win price macros. |
| <i>duration*</i> | <i>integer</i> | Video ad duration in seconds, for example, 13 REQUIRED in bid responses to BrightRoll Video (brx). |
| <i>native*</i> | <i>object</i> | Contains the details of the native response, for more information, see <i>Native Response Object</i> (page 79). |
| <i>deal*</i> | <i>string</i> | This is the ID of the deal between a publisher and a seat. It is used only if an exchange supports private auctions. If the bid is associated with a direct deal then this field is required and its value should be equal to one of the elements in the <code>pmp.deals</code> field in the bid request object. Deprecated since version 2.5: use <code>seatbid.bid.dealid</code> instead. |
| <i>img_url*</i> | <i>string</i> | The URL of the creative image. In order to receive the user cookie and win price, this URL should point to the Buyer handler and redirect to the actual creative location. The url may contain the win price macro, e.g. <code>#{AUCTION_PRICE}</code> , but not the click macro. If this field is present, the <code>nurl</code> field of the bid response will be ignored. Note: This field is only valid in 2.x bid responses, see the <i>Deprecated 2.x Properties</i> (page 15) section for more details. |
| <i>click_url*</i> | <i>string</i> | The creative click URL. Required if the <code>img_url</code> field is present. Note: This field is only valid in 2.x bid responses, see the <i>Deprecated 2.x Properties</i> (page 15) section for more details. |
| <i>js_url*</i> | <i>string</i> | A Javascript-based win notice URL. <ul style="list-style-type: none"> • For in-app inventory, the ad markup should be returned using this URL. • For website or video inventory this field may be used as a substitute for the <code>nurl</code> field. • Ad markup should be in JavaScript format. • The URL may contain macros, see the <i>Macros</i> (page 105) section for more details. Note: This field is only valid in 2.x bid responses, see the <i>Deprecated 2.x Properties</i> (page 15) section for more details. |

Note: Some of the fields are required by certain Suppliers. Responses to bid requests from these Suppliers without the required fields will be discarded.

6.3.2 Required Bid Response Fields Per Supplier

Table 6.8: Required Bid Response Fields Per Supplier

| Supplier | Required field(s) |
|---------------------------|---|
| BrightRoll Video (brx) | ext.advertiser_name, ext.duration |
| BrightRoll SSP (rmx) | cat, ext.language |
| Centro | ext.advertiser_name |
| LiveIntent | Ad markup should contain the ad image tag and no more than one pixel. |
| Millennial Media (nexage) | cid |
| MoPub | cid, cat |
| OpenX Japan | ext.language |
| Rubicon | cid |
| Smaato | cid, cat |
| Ströer (adscale) | ext.advertiser_name, ext.agency_name |
| YieldOne | cat |

6.4 Native Response Object

Note: Fields marked with an asterisk (*) are optional.

Table 6.9: Native Object Properties

| Value | Type | Description |
|-----------------------|-------------------------|--|
| <i>assets</i> | <i>array of objects</i> | List of native ad assets. |
| <i>link</i> | <i>object</i> | The <i>Native Link Object</i> (page 82). This is the 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 has no link object, the parent link object applies. |
| <i>imptrackers</i> ** | <i>array of strings</i> | An array of impression tracking URLs, expected to return a 1x1 image or 204 response, for example, ["http://adserver.com/native?impid=102"] Note: This field should NOT contain the win price macro. |
| <i>ext</i> * | <i>object</i> | <i>Native Ext Object</i> (page 80). |
| <i>ver</i> * | <i>integer</i> | Version of the Native Markup version in use, for example, 1. |

Note: (**) *imptrackers* array should be used with following constraints:

For Rubicon, only one element is guaranteed to be triggered. Place the trackers in the order of importance, otherwise this array is optional and may not be present in each response.

6.4.1 Native Ext Object

Table 6.10: Native Ext Object Properties

| Value | Type | Description |
|---------------------|---------------|--|
| <i>viewtracker*</i> | <i>string</i> | The view tracking URL that will be called when the ad is visible, if supported by the Supplier, for example, "http://adserver.com/native_view?impid=102" |
| <i>adchoiceurl*</i> | <i>string</i> | A Buyer specific AdChoices URL that will replace default Supplier AdChoices URL, for example, 'https://adserver.com/privacy'. |

6.4.2 Native Assets Object

Note:

- (*) There may be exactly one of the fields marked with asterisk in one asset object.
- (**) The link object is optional and may not be present in each response.

Table 6.11: Native Asset Object Properties

| Value | Type | Description |
|------------------|----------------|--|
| <i>id</i> | <i>integer</i> | A unique asset ID, must match one of the asset IDs in the bid request, for example, 1. |
| <i>required*</i> | <i>integer</i> | Set to 1 if the asset is required (bidder requires it to be displayed), default is 0, for example, 1. |
| <i>title*</i> | <i>object</i> | Title object for a title asset, see, <i>Native Assets Title Object</i> (page 81). |
| <i>img*</i> | <i>object</i> | Image object for an image asset, see, <i>Native Assets Image Object</i> (page 81). |
| <i>video*</i> | <i>object</i> | Video object for a video asset, see, <i>Native Asset Video Object</i> (page 81). |
| <i>data*</i> | <i>object</i> | Data object for a data asset, see, <i>Native Asset Data Object</i> (page 82). |
| <i>link **</i> | <i>object</i> | Link object for a call to action. <ul style="list-style-type: none"> • 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. See <i>Native Link Object</i> (page 82). |

6.4.3 Native Assets Title Object

Table 6.12: Native Asset Title Object Properties

| Value | Type | Description |
|--------------|--------|--|
| <i>text*</i> | string | The text associated with the title element. "Our product is the best!" |

6.4.4 Native Assets Image Object

Table 6.13: Native Asset Image Object Properties

| Value | Type | Description |
|------------|---------|---|
| <i>url</i> | string | URL of the image asset, for example, "http://adserver.com/image?impid=102". |
| <i>h</i> | integer | Height of the image in pixels, for example, 250. |
| <i>w</i> | integer | Width of the image in pixels, for example, 300. |

(*) The field is optional and may not be present in each response.

6.4.5 Native Asset Video Object

Table 6.14: Native Asset Video Object Properties

| Value | Type | Description |
|----------------|--------|---|
| <i>vasttag</i> | string | Vast XML, use the following example to format your VAST XML response. |

```
<?xml version="1.0" encoding="UTF-8"?>
<VAST version="2.0">
  <Ad id="12345">
    <Inline>
      <AdSystem version="1.0">SpotXchange</AdSystem>
      <AdTitle><![CDATA[Sample VAST]]></AdTitle>
      <Impression>http://sample.com</Impression>
      <Description><![CDATA[A sample VAST feed]]></Description>
      <Creatives>
        <Creative sequence="1" id="1">
          <Linear>
            <Duration>00:00:30</Duration>
            <TrackingEvents />
            <VideoClicks>
              <ClickThrough><![CDATA[http://sample.com/openrt btest]]>
            </ClickThrough>
            </VideoClicks>
            <MediaFiles>
              <MediaFile delivery="progressive" bitrate="256">
```

```

        width="640" height="480" type="video/mp4">
        <![CDATA[http://sample.com/video.mp4]]>
        </MediaFile>
    </MediaFiles>
</Linear>
</Creative>
</Creatives>
</InLine>
</Ad>
</VAST>

```

6.4.6 Native Asset Data Object

Table 6.15: Native Asset Data Object Properties

| Value | Type | Description |
|--------------|---------------|--|
| <i>value</i> | <i>string</i> | 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”. |

6.4.7 Native Link Object

Table 6.16: Native Link Object Properties

| Value | Type | Description |
|-----------------------|-------------------------|--|
| <i>url</i> | <i>string</i> | Landing URL of the clickable link, for example, "http://advertiser.com/" |
| <i>clicktrackers*</i> | <i>array of strings</i> | Click tracker URLs to be activated when the URL is clicked, for example, ["http://adserver.com/click?impid=102"] |

6.5 Supplier Specific Fields

Note: Fields marked with an asterisk (*) are optional.

Table 6.17: Google Object Properties

| Value | Type | Description |
|---------------------|----------------------|--|
| <i>attribute*</i> | <i>integer array</i> | List of creative attributes as defined by Google, for example, [32, 22] |
| <i>vendor_type*</i> | <i>integer array</i> | List of creative vendor types as defined by Google, for example, [42, 43] See the Google RTB Docs Download ²⁵ page for this information. |

Table 6.18: Yieldone Object Properties

| Value | Type | Description |
|------------------------------|----------------|---|
| <i>creative_type*</i> | <i>string</i> | Creative type as defined by YieldOne, for example, "HTML" |
| <i>creative_category_id*</i> | <i>integer</i> | Creative category as defined by YieldOne. The field is recommended for YieldOne bids, for example, 79 |

6.6 Bid Response JSON Examples

If the Buyer opts to not bid on the bid request, it should respond with a HTTP 204 response. BidSwitch also accepts bid responses with an empty array of seatbid objects as valid nobid responses.

- *Banner Bid Response* (page 83)
- *Secure Banner Bid Response* (page 84)
- *Video Bid Response* (page 85)
- *Secure Video Bid Response* (page 86)
- *Secure Audio Bid Response* (page 86)
- *Native Bid Response* (page 87)
- *Secure Native Bid Response* (page 88)
- *Multi-bid Response* (page 90)
- *Private Deal Bid Request Response* (page 91)
- *BidSwitch No Bid Reason* (page 92)
- *TV/DOOH Bid Response* (page 92)

6.6.1 Banner Bid Response

The following example shows an ad being served from the `adm` field, with the bid price for the impression being \$9.43 CPM.

²⁵ <https://developers.google.com/ad-exchange/rtb/downloads>


```

{
  "id": "1234567890",
  "ext": {
    "protocol": "5.1"
  },
  "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=${CLICK_
↪URL:URLENCODE}\"><img src=\"http://image1.cdn.com/impid=102\"/></a>",
          "nurl": "http://adserver.com/winnotice?impid=102&winprice=${AUCTION_PRICE}",
          "iurl": "http://adserver.com/preview?crd=314",
          "adomain": [
            "advertiserdomain.com"
          ],
          "ext": {
            "advertiser_name": "Coca-Cola",
            "language": "en",
            "agency_name": "CC-advertising"
          }
        }
      ],
      "seat": "4"
    }
  ]
}

```

6.6.2 Secure Banner Bid Response

The following example shows an ad being served from the `adm` field, with the bid price for the impression being \$9.43 CPM, and suitable for serving in HTTPS environment.

```

{
  "id":"1234567890",
  "ext":{"
    "protocol":"5.1"
  },
  "seatbid":[
    {
      "bid":[
        {
          "id":"1",
          "impid":"102",
          "price":9.43,

```

```

        "adid": "314",
        "cid": "42",
        "cat": [
            "IAB12"
        ],
        "adm": "<a href=\"https://adserver.com/clickadid=12345&tracker=${CLICK_
↵URL:URLENCODE}\"><img src=\"https://image1.cdn.com/impid=102\"/></a>",
        "nurl": "https://adserver.com/winnotice?impid=102&winprice=${AUCTION_PRICE}
↵",
        "iurl": "http://adserver.com/preview?crid=314",
        "adomain": [
            "advertiserdomain.com"
        ],
        "ext": {
            "advertiser_name": "Coca-Cola",
            "language": "en",
            "agency_name": "CC-advertising"
        }
    }
},
    "seat": "8"
}
]
}

```

6.6.3 Video Bid Response

```

{
    "cur": "USD",
    "ext": {
        "protocol": "5.1"
    },
    "id": "e9c3e120-ffcb-4300-9c98-644cb26f95df",
    "seatbid": [
        {
            "bid": [
                {
                    "adid": "3",
                    "nurl": "http://adserver.com/winnotice?impid=102&winprice=${AUCTION_PRICE}
↵",
                    "adomain": [
                        "nokia.com"
                    ],
                    "cid": "11",
                    "ext": {
                        "vast_url": "http://adserver.com/vast?impid=102",
                        "duration": 15,
                        "advertiser_name": "Nokia"
                    },
                    "id": "1c3ff810-3623-4b04-8396-9e7ca071cb72",
                    "impid": "1",

```

```

        "price":4.079077199308326
      }
    ],
    "seat":"1"
  }
]
}

```

6.6.4 Secure Video Bid Response

```

{
  "cur":"USD",
  "ext":{"
    "protocol":"5.1"
  },
  "id":"e9c3e120-ffcb-4300-9c98-644cb26f95df",
  "seatbid":[
    {
      "bid":[
        {
          "adid":"3",
          "nurl":"https://adserver.com/winnotice?impid=102&winprice=${AUCTION_PRICE}
↔",
          "adomain":[
            "nokia.com"
          ],
          "cid":"11",
          "ext":{"
            "vast_url":"https://adserver.com/vast?impid=102",
            "duration":15,
            "advertiser_name":"Nokia"
          },
          "id":"1c3ff810-3623-4b04-8396-9e7ca071cb72",
          "impid":"1",
          "price":4.079077199308326
        }
      ],
      "seat":"1"
    }
  ]
}

```

6.6.5 Secure Audio Bid Response

```

{
  "cur":"USD",
  "ext":{"
    "protocol":"5.1"
  },

```

```

{id":"e9c3e120-ffcb-4300-9c98-644cb26f95df",
"seatbid":[
  {
    "bid":[
      {
        "adid":"3",
        "nurl":"https://adserver.com/winnotice?impid=102&winprice=${AUCTION_PRICE}
↵",
        "adomain":[
          "nokia.com"
        ],
        "cid":"11",
        "ext":{
          "daast_url":"https://adserver.com/daast?impid=102",
          "duration":15,
          "advertiser_name":"Nokia"
        },
        "id":"1c3ff810-3623-4b04-8396-9e7ca071cb72",
        "impid":"1",
        "price":4.079077199308326
      }
    ],
    "seat":"1"
  }
]
}

```

6.6.6 Native Bid Response

The following example shows a native bid response with the title and image asset specified.

```

{
  "id":"1234567890",
  "ext":{
    "protocol":"5.1"
  },
  "seatbid":[
    {
      "bid":[
        {
          "id":"1",
          "impid":"102",
          "price":9.43,
          "adid":"314",
          "cid":"42",
          "cat":[
            "IAB12"
          ],
          "nurl":"http://adserver.com/winnotice?impid=102&winprice=${AUCTION_PRICE}",
          "adomain":[
            "advertiserdomain.com"
          ]
        }
      ]
    }
  ]
}

```

```

    ],
    "ext":{
      "advertiser_name":"Coca-Cola",
      "language":"en",
      "agency_name":"CC-advertising",
      "native":{
        "ver":1,
        "link":{
          "url":"http://adserver.com/click?impid=102"
        },
        "imptrackers":[
          "http://adserver.com/native?impid=102"
        ],
        "assets":[
          {
            "id":1,
            "required":1,
            "title":{
              "text":"A test Native Ad"
            }
          },
          {
          }
        ]
      }
    }
  ],
  "seat":"58"
}
]
}

```

6.6.7 Secure Native Bid Response

The following example shows a native bid response with the title and image asset specified for serving in an HTTPS environment.

```

{
  "id":"1234567890",
  "ext":{
    "protocol":"5.1",
    "id":3,
    "required":1,
    "img":{
      "url":"https://adserver.com/image?crid=314"
    }
  },
  "seatbid":[
    {

```

```

"bid":[
  {
    "id":"1",
    "impid":"102",
    "price":9.43,
    "adid":"314",
    "cid":"42",
    "cat":[
      "IAB12"
    ],
    "nurl":"https://adserver.com/winnotice?impid=102&winprice=${AUCTION_PRICE}
↔",
    "adomain":[
      "advertiserdomain.com"
    ],
    "ext":{
      "advertiser_name":"Coca-Cola",
      "language":"en",
      "agency_name":"CC-advertising",
      "native":{
        "ver":1,
        "link":{
          "url":"https://adserver.com/click?impid=102"
        },
        "imptrackers":[
          "https://adserver.com/native?impid=102"
        ],
        "assets":[
          {
            "id":1,
            "required":1,
            "title":{
              "text":"A test Native Ad"
            }
          },
          {
            "id":2,
            "required":1,
            "title":{
              "text":"A test Native Ad"
            }
          }
        ]
      }
    }
  },
  {
    "id":"2",
    "impid":"102",
    "price":9.43,
    "adid":"314",
    "cid":"42",
    "cat":[
      "IAB12"
    ],
    "nurl":"https://adserver.com/winnotice?impid=102&winprice=${AUCTION_PRICE}
↔",
    "adomain":[
      "advertiserdomain.com"
    ],
    "ext":{
      "advertiser_name":"Coca-Cola",
      "language":"en",
      "agency_name":"CC-advertising",
      "native":{
        "ver":1,
        "link":{
          "url":"https://adserver.com/click?impid=102"
        },
        "imptrackers":[
          "https://adserver.com/native?impid=102"
        ],
        "assets":[
          {
            "id":1,
            "required":1,
            "title":{
              "text":"A test Native Ad"
            }
          },
          {
            "id":2,
            "required":1,
            "title":{
              "text":"A test Native Ad"
            }
          }
        ]
      }
    }
  }
],
"seat":"1"
}
]
}

```

6.6.8 Multi-bid Response

The following bid response example contains two bids, one for \$9.43 CPM and one for \$5.50 CPM. Both bids target the same ad slot, both would take part in the auction and if the first one is discarded due to publisher-side blocklist then the second one would be able to win the auction.

```
{
  "id": "1234567890",
  "ext": {
    "protocol": "5.1"
  },
  "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=${CLICK_
↪URL:URLENCODE}\"><img src=\"http://image1.cdn.com/impid=102\"/></a>",
          "nurl": "http://adserver.com/winnotice?impid=102&winprice=${AUCTION_PRICE}
↪",
          "iurl": "http://adserver.com/preview?crid=314",
          "adomain": [
            "advertiserdomain.com"
          ],
          "ext": {
            "advertiser_name": "Coca-Cola",
            "language": "en",
            "agency_name": "CC-advertising"
          }
        },
        {
          "id": "2",
          "impid": "102",
          "price": 5.5,
          "adid": "413",
          "cid": "43",
          "cat": [
            "IAB12"
          ],
          "adm": "<a href=\"http://adserver.com/click?adid=12345&tracker=${CLICK_
↪URL:URLENCODE}\"><img src=\"http://image1.cdn.com/impid=102\"/></a>",
          "nurl": "http://adserver.com/winnotice?impid=413&winprice=${AUCTION_PRICE}
↪",
          "iurl": "http://adserver.com/preview?crid=413",
          "adomain": [
            "advertiserdomain.com"
          ]
        }
      ]
    }
  ]
}
```

```

    ],
    "ext":{
      "advertiser_name":"Coca-Cola",
      "language":"en",
      "agency_name":"CC-advertising"
    }
  }
],
"seat":"1"
}
]
}

```

6.6.9 Private Deal Bid Request Response

```

{
  "id":"1234567892",
  "ext":{
    "protocol":"5.1"
  },
  "cur":"USD",
  "seatbid":[
    {
      "bid":[
        {
          "id":"1114125-afaff2f-af2251",
          "impid":"1",
          "price":9.43,
          "adid":"314",
          "dealid":"deal-1",
          "adm":"<a href=\"http://adserver.com/click?adid=12345&tracker=${CLICK_
↪URL:URLENCODE}\"> <img src=\"http://image1.cdn.com/impid=102\"/></a>",
          "nurl":"http://adserver.com/winnotice?impid=102&winprice=${AUCTION_PRICE}",
          "adomain":[
            "advertiserdomain.com"
          ]
        }
      ],
      "seat":"58"
    }
  ]
}

```

6.6.10 Buyer No Bid Response

The following example shows a No Bid Response coming from a Buyer, which is an empty bid response.

Note: The preferred No Bid Response format is an empty HTTP 204 response.

```
{
  "id": "1234567891",
  "ext": {
    "protocol": "5.1"
  },
  "seatbid": []
}
```

6.6.11 BidSwitch No Bid Reason

The following example shows a No Bid Reason coming from BidSwitch, which includes the reason code using the `nbr` field.

```
{
  "id": "1234567890",
  "seatbid": [
  ],
  "nbr": 4
}
```

6.6.12 TV/DOOH Bid Response

```
{
  "cur": "USD",
  "ext": {
    "protocol": "5.1"
  },
  "id": "e9c3e120-ffcb-4300-9c98-644cb26f95df",
  "seatbid": [
    {
      "bid": [
        {
          "adid": "3",
          "nurl": "http://adserver.com/winnotice?impid=102&winprice=${AUCTION_PRICE}"
        },
        {
          "adomain": [
            "nokia.com"
          ],
          "cid": "11",
          "ext": {
            "vast_url": "http://adserver.com/vast?impid=102",
            "duration": 15,
            "advertiser_name": "Nokia"
          }
        }
      ],
      "id": "1c3ff810-3623-4b04-8396-9e7ca071cb72",

```

```
        "impid": "1",
        "price": 4.079077199308326
      }
    ],
    "seat": "1"
  }
}
```

Buyers can optimise their BidStream by putting users into groups, as explained in the [SmartSwitch User Optimization](#)²⁶ section. This enables BidSwitch to send more traffic from users marked as valuable to Buyers. To sync app users with the most appropriate user group, use one of the following methods.

Real-time User-Group Syncing The Buyer makes a call to the BidSwitch Mobile-Users Sync endpoint and using the appropriate URL parameters assigns a user to their group. This is the preferred method as it updates user group records immediately.

User-Group TSV Upload Using this method, the Buyer uploads a daily TSV file with user group information.

7.1 Real-time User-Group Syncing

To sync a particular app user with a user group, the Buyer should make a call to the BidSwitch Mobile-Users Sync endpoint. You can do this from within the app, or using a server-to-server call.

- If making the call from within the app, use the following endpoint `http(s)://x.bidswitch.net/sync_ifa` and provide the required parameters.
- If using a server-to-server call, the endpoint domain is region specific:
 - US: `us-east.bidswitch.net`
 - EU: `eu.bidsiwth.net`
 - APAC: `apac-jp.bidswitch.net`

²⁶ <https://docs.bidswitch.com/support/smart-switching-user-groups.html#smart-switch>

Table 7.1: App-User Sync URL Parameters

| Value | Type | Description |
|-------------------|----------------|--|
| <i>dsp_id</i> | <i>string</i> | The ID assigned to the Buyer by BidSwitch, for example, 123 |
| <i>ifa</i> | <i>string</i> | The native identifier for advertisers. An ID assigned by the device or browser for use as an advertising identifier, for example Apple's IDFA or Android's Advertising ID. |
| <i>user_group</i> | <i>integer</i> | Sets the user group with which to sync this user. The valid values for user groups are 0 - 5. <ul style="list-style-type: none"> • 0: Unwanted users. • 1: Regular users. No explicit interest in receiving ad requests. • 2 - 5: Valuable users: The Buyer wants to receive as many ad requests as possible from these users |

Example Syntax

```
http(s)://x.bidswitch.net/sync_ifa?dsp_id=${dsp_id}&ifa=${ifa}&user_group=${user_group}
```

Example HTTP

```
http://x.bidswitch.net/sync_ifa?dsp_id=1&ifa=ABC&user_group=2
```

Example HTTPS

```
https://x.bidswitch.net/sync_ifa?dsp_id=1&ifa=ABC&user_group=2
```

Example Server to Server

```
https://apac-jp.bidswitch.net/sync_ifa?dsp_id=1&ifa=ABC&user_group=2
```

7.2 User-Group TSV Upload

Buyers can also upload a daily TSV (tab separated values) file. To do this, use the following steps:

1. Generate a pair of public/private SSH keys.
2. Email BidSwitch support (support@bidswitch.com) requesting an SFTP account and attach your public key to the ticket.
3. BidSwitch will provide connection details when setup is complete.
4. When everything has been setup, you will need to generate a `.tsv` file.
5. Send the `.tsv` file with the following fields:
 - *IFA*: The native identifier for advertisers.
 - *Region*: [US or EU or AS], select only 1.
 - *User group*: Select only 1 numerical value. This value should be in the range 0 - 5. See the table in the *Real-time User-Group Syncing* (page 94) section for the significance of the numbers.

6. The file needs to have the `.tsv` extension or it cannot be processed by the system.
7. Place the TSV file(s) in the upload folder.
8. Once processed the file will be removed from the upload folder and placed in the processed folder

The TSV file format should look similar to:

| |
|--------------------------------|
| UUID<tab>region<tab>user_group |
|--------------------------------|

Note: Each TSV file cannot contain more than a 1000 rows. If necessary, please create multiple files of 1000 records/lines.

CHAPTER 8

BIDSWITCH DATA CENTRES

Table 8.1: BidSwitch Data Centres and IP Addresses

| Geo | Data Centre | IP Values |
|---------|-----------------------|--|
| US East | Amazon Virginia | Search for <code>us-east-1</code> in the following the list. https://ip-ranges.amazonaws.com/ip-ranges.json |
| US West | The Dalles, Oregon | Google Cloud Platform zones ²⁷ |
| APAC | Amazon Japan | Search for <code>ap-northeast-1</code> in the following the list. https://ip-ranges.amazonaws.com/ip-ranges.json |
| Europe | St. Ghislain, Belgium | Google Cloud Platform zones ²⁸ |

For measuring latency and timeouts, the following BidSwitch hosts can be pinged:

- `apac-jp.bidswitch.net`
- `eu.bidswitch.net`
- `us-east.bidswitch.net`
- `us-west.bidswitch.net`

²⁷ <https://cloud.google.com/compute/docs/regions-zones/regions-zones>

²⁸ <https://cloud.google.com/compute/docs/regions-zones/regions-zones>

CHAPTER 9

BUYER BEST PRACTICES

The following list mentions a number of best practices which can improve your experience when using BidSwitch.

- Integrate with the latest version of the BidSwitch protocol, see the [BidSwitch Protocol v5.1](#)²⁹ section
- Ensure user groups are well defined for SmartSwitch as this increases the quality of traffic sent to Buyers, see the [SmartSwitch User Optimization](#)³⁰ section
- Don't demand more than your QPS limit as it could result in server overload, [QPS Overview](#)³¹
- To reduce latency between your servers and BidSwitch, set your server locations as close as possible. See the [BidSwitch Data Centres](#) (page 97) section
- To reduce latency between your servers use `gzip` when sending or receiving data, see the [Data Format](#) (page 104) section
- Keep connections alive

²⁹ <https://docs.bidswitch.com/standards/standards.html#bsw-proto>

³⁰ <https://docs.bidswitch.com/support/smart-switching-user-groups.html#smart-switch>

³¹ <https://docs.bidswitch.com/support/smart-switching-overview.html#qps-ref>

CHAPTER 10

BUYER USER MATCHING

User matching, or cookie syncing, is the process of matching a Supplier's cookie ID to a Buyer's cookie ID. BidSwitch has an integrated user matching functionality to facilitate this between Buyers and Suppliers. User matching information is managed within the BidSwitch database, so there is no need for Buyers to implement user matching logic to store user mappings. **Note:** To sync app users, see the *In-App User Optimization* (page 94) section.

When sending bid requests to the Buyer, BidSwitch will send both the Buyer User ID and the BidSwitch User ID in the `buyeruid` and `id` fields of the *User Object* (page 44).

Table 10.1: Supplier-Buyer User Matching

| Supplier to BidSwitch Bid Request | BidSwitch to Buyer Bid Request |
|--|--|
| <pre>{ "user":{ "id":"ssp-cookie-1234", "buyeruid":"bsw-cookie-54321", } }</pre> | <pre>{ "user":{ "id":"bsw-cookie-54321", "buyeruid":"DSP-cookie-5678", } }</pre> |

Note: If the user ID is not available, then only the BidSwitch user ID will be sent. There are cases when the BidSwitch ID is not available either, in this case neither ID can be sent to the DSP.

10.1 Buyer Initiated User Matching

To sync a particular user with BidSwitch, the Buyer should redirect the user's browser to the BidSwitch sync URL, <http://x.bidswitch.net/sync>, expecting to receive a 1x1 .gif image as a result, and provide the following HTTP request parameters.

Note:

- The BidSwitch matching URL also supports secure HTTPS connections.
- Fields marked with asterisk (*) are optional.

Table 10.2: HTTP Request Parameters

| Value | Type | Description |
|--------------------|----------------|---|
| <i>dsp_id</i> | <i>string</i> | The ID assigned to the Buyer by BidSwitch, for example, 123 |
| <i>user_id</i> | <i>string</i> | The User ID in the Buyers's system, for example 123456. If the value is an empty string, the user is considered unmatched and no further sync requests are sent for this user, for the duration of the time set with the <code>expires</code> parameters. See <i>Not Syncing Certain Users</i> (page 101) for more details. |
| <i>expires*</i> | <i>integer</i> | Expiration time in days for user matching, for example 5. The default value is 90. See the <i>Cookie Syncing Best Practices</i> (page 100) section about how to get the most out of user matching. |
| <i>user_group*</i> | <i>integer</i> | Sets the user group with which to sync this user. The valid values for user groups are 0 - 5, with 0 always being considered unmatched users in BidSwitch. See the <i>User Group Syncing</i> (page 101) section for more details. |

```
# User sync
https://x.bidswitch.net/sync?dsp_id=123&user_id=1234567890&expires=30

# Do Not User Sync
# Redirecting a user to the following URL will not sync the
# specified user for the next 5 days, and will consider bids
# from this user as user-unmatched for the given DSP
http://x.bidswitch.net/sync?dsp_id=123&user_id=&expires=5
```

10.2 Cookie Syncing Best Practices

While it is also the responsibility of Buyers to play an active part in the cooking syncing process, BidSwitch strongly recommends the following Supplier practices to maximise ROI.

- If there is any cookie logic, ensure that BidSwitch is set with a high priority.
- Set the BidSwitch cookie expiration date to less than 30 days. Ideally between 5 - 10 days. This will enable the Supplier to cookie sync with BidSwitch more often.
- Aim to cookie sync user data with BidSwitch once per day.

10.3 User Group Syncing

During cookie syncing, when a Buyer sends their cookie ID to BidSwitch, it is possible to append the `user_group` parameter to the pixel. This specifies which group BidSwitch should place the user in for SmartSwitch filtering.

- To learn more about SmartSwitch, see the [SmartSwitch Overview](#)³² section.
- To learn about how user groups can improve the quality of inventory in your BidStream, see the [SmartSwitch User Optimization](#)³³ section.
- For in-app syncing, see the *In-App User Optimization* (page 94) section.

Supplier Initiated Cookie Sync Response:

```
## Syntax
http://x.bidswitch.net/sync?dsp_id=[DSP_ID]&user_id=[DSP_COOKIE_ID]&expires=30&ssp=[SSP_
↳NAME]&user_group=[NUMERICAL_VALUE]

## Example
http://x.bidswitch.net/sync?dsp_id=1&user_id=1235ABC&expires=30&ssp=rubicon&user_group=5
```

Buyer initiated cookie sync:

```
## Syntax
http://x.bidswitch.net/sync?dsp_id=[DSP_ID]&user_id=[DSP_COOKIE_ID]&expires=30&user_
↳group=[NUMERICAL_VALUE]

## Example
http://x.bidswitch.net/sync?dsp_id=1&user_id=1235ABC&expires=30&user_group=5
```

10.4 Not Syncing Certain Users

A Buyer may differentiate between valuable and not valuable users. The latter are usually users that don't have any re-targeting or third party data recorded for them. It is highly recommended that in the case of a sync request for a not valuable user, the Buyer responds with a 302 redirect to the BidSwitch sync url with an empty `user_id` parameter, for example,

```
http://x.bidswitch.net/sync?dsp_id=123&user_id=&expires=5&ssp=rubicon
```

³² <https://docs.bidswitch.com/support/smart-switching-overview.html#ss-overview>

³³ <https://docs.bidswitch.com/support/smart-switching-user-groups.html#smart-switch>

10.5 BidSwitch Initiated User Matching

BidSwitch can also initiate user synchronization. The partner issues BidSwitch a matching URL that redirects to the pixel URL described in the *Buyer Initiated User Matching* (page 99) section, with properly populated `dsp_id`, `user_id`, and `expires` parameters.

Note: This URL should be for a pixel that performs a 302 redirect, rather than for an iframe with a script inside it. The only redirect from the DSP's matching URL should be to the BidSwitch pixel.

The matching redirect URL, issued by a Buyer should contain the `${SSP}` macro. This macro is substituted with the Supplier ID on the BidSwitch side before sending a user to the partner. The value of the macro should be sent back to BidSwitch in the Supplier parameter. An example of the matching URL, provided by the partner is shown below

```
http://www.dsp-example.com/bsw_sync?bidswitch_ssp_id=${SSP}
```

Here, the `bidswitch_ssp_id` parameter name can be changed to any other name chosen by the DSP. On receiving a call to the above URL, the partner should respond with a 302 redirect to the BidSwitch matching URL with valid `dsp_id`, `user_id` and `expires` parameters as described in the *Buyer Initiated User Matching* (page 99) section, and providing one additional Supplier parameter with the value of the `${SSP}` macro. So sending a call to the partner matching URL in the form of the following example.

```
http://www.dsp-example.com/bsw_sync?bidswitch_ssp_id=rubicon
```

The Buyer server should respond with a 302 redirect to the BidSwitch matching URL based on the following example `dsp_id`, `user_id` and `expires` parameters.

```
http://x.bidswitch.net/sync?dsp_id=123&user_id=123&expires=5&ssp=rubicon
```

In addition to HTTP protocol, the matching redirect URL provided by the partner should also support secure HTTPS connections. If BidSwitch initiates a user call using HTTPS protocol, the partner should redirect the user to the BidSwitch matching URL using a secure HTTPS connection.

After BidSwitch initiates user matching, it associates the value of the `user_id` parameter with the user's browser and makes it available in any later bid requests from this user's browser. This will be sent in the `buyeruid` field of the JSON bid request.

Note: The `user_id` should not exceed 36 characters.

10.6 User Syncing FAQ

How do I delete a user group? A user group will be deleted automatically if it doesn't contain any users, or all users are expired.

How do I remove users from a group? You can sync the users in question with a new user group, or you can sync users with the option `user_group=0` to place them in the unsynced user group.

Once set, will our feed include only bid requests from those user groups? No, the user group is only 1 parameter among others such as geo, ssp, publisher, site, domain, etc. See the [SmartSwitch Overview³⁴](#) section for more information. Each of these parameters is important and the `user_group` is only one amongst the others.

³⁴ <https://docs.bidswitch.com/support/smart-switching-overview.html#ss-overview>

BidSwitch supports JSON and Compressed JSON (gzip) as data formats for bid requests and bid responses. It is recommended to use Compressed JSON to minimize the amount of data exchanged between BidSwitch and the bidder, as this reduces latency times between servers.

In order to configure the bidder side to receive Compressed JSON bid requests, please contact BidSwitch support at support@bidswitch.com.

Once enabled, BidSwitch starts sending bid requests in Compressed JSON. All such bid requests carry an extra HTTP header **Content-Encoding: gzip**. It is recommended for the bidder to check for this HTTP header to distinguish between JSON and Compressed JSON bid request formats.

Sending bid responses in Compressed JSON doesn't require special configuration. The bidder is only required to set an extra HTTP header, **Content-Encoding: gzip**, in the responses where the compression is used.

- *Win price macro* (page 105)
- *Supplier Click Tracking URL Macro* (page 106)
- *Click Tracker at Google Adx* (page 106)

12.1 Win price macro

In order for the exchange to convey certain information to the winning bidder (e.g., the settlement price), some substitution macros can be inserted into the win notice URL. Prior to calling a win notice URL, BidSwitch will search the specified URL for any of the defined macros and replace them with the appropriate data. Note that the substitution is simple in the sense that wherever a legal macro is found, it will be replaced without regard for syntax correctness.

- In version 4.x, the win price macro should be used in `nurl` field, and the click tracking macro may be used in the `adm` field.
- In version 5.x, the win price can be used in the `adm` field, with restrictions. See the *5.x Updating Overview* (page 18) section for details.

Table 12.1: Macros

| Value | Type |
|--------------------------------|--|
| <code>\${AUCTION_PRICE}</code> | Settlement price for the auction. The substituted value will be defined as CPM. See the <i>Bid Object</i> (page 75) section for usage details. |

12.2 Supplier Click Tracking URL Macro

Some Suppliers require the Buyer to add a Supplier click URL macro to all creatives for click reporting. Buyers wishing to bid on such bid requests should add the click tracking macro to the creative markup in the `adm` field. The Supplier will replace the macro with the Supplier click tracking URL. If the Seller doesn't support click tracking macros, then BidSwitch will replace the tracking macro with an empty string.

Note:

- This is a strict requirement if the bid request contains `ext.clktrkrq` field and is strongly recommended in other cases.
- In the case of video and native inventory, click tracking is handled on the Supplier side and the click macro is not used, as well as the `adm` field.

Table 12.2: Click Tracking Macro

| Value | Type |
|-------------------------------------|---|
| <code>#{CLICK_URL:URLENCODE}</code> | A placeholder for the Supplier click tracking URL in url-encoded form. Required for bids to Suppliers that support click tracking. No more than one click tracking macro can be used in the <code>bid.adm</code> field. |

The Supplier click URL (if present) should be inserted before the landing page in the creative. The landing page URL should be single-escaped. For example, if the Buyer click-URL contains

```
http://dsp.com/click?bc=dnJD723&sspclick=#{CLICK_URL:URLENCODE}
```

The macro is replaced and the user clicks the resulting URL

```
http://dsp.com/click?bc=dnJD723&sspclick=http%3A%2F%2Fssp.com%2Fclick%3Fic%3DbKk4%26lp%3D
```

The Buyer unescapes the `sspclick` parameter and redirects to the target URL while adding the landing page at the end

```
http://ssp.com/click?ic=bKks3k4&lp=http%3A%2F%2Fadvertiser.com%2Fhomepage
```

12.3 Click Tracker at Google Adx

Google requires all certified third-party ad tags that host and serve creatives allow Google dynamically generate a unique click URL and pass it through the ad tag upon each ad request. If a user clicks on the ad, the third-party vendor will make an HTTP request to the Google click URL from the user's browser in order for Google to be able to track clicks on the ad.

The Google click URL contains a number of different key-value pairs that are delimited with characters such as "&" and "?".

Depending on the implementation method, the Google click URL's key-value pairs can conflict with the third-party key-value pairs that use these same delimiters. Therefore, the Google click URL may need to be *escaped* in order to eliminate any code conflicts. You can read more about it here on the google website, [Google Click Tracking macro](#)³⁵, and use the following escaped URL as an example for how to implement it.

```
http://googleads.g.doubleclick.net/pagead/aclk%3Fsa%3D1%26ai%3DBsD-  
↪iGQbNSun3LJvqjQTgOMWeDOctkEmu5vD7CsCNtwGQTE9QMEAAAA%26num%3D1%26client%3Dca-mongoogle  
↪%26adurl%3D
```

³⁵ <https://support.google.com/adxbuyer/answer/3187721?hl=en>

CHAPTER 13

SENSITIVE CATEGORIES AND RICH MEDIA

For greater coverage of sensitive categories BidSwitch extends the standard IAB list with additional categories. These categories may be used in the following fields.

Table 13.1: Sensitive Categories Fields

| Bid Requests | Bid Response |
|---|-----------------|
| <ul style="list-style-type: none">• bcat• site.cat• app.cat | seatbid.bid.cat |

Table 13.2: BidSwitch Sensitive Categories

| ID | Category |
|-------|---|
| BSW1 | Alcohol |
| BSW2 | Gambling |
| BSW3 | Tobacco and smoking |
| BSW4 | Firearms and weapons |
| BSW5 | Sexual & Reproductive Health |
| BSW6 | Ringtones & Downloadable |
| BSW7 | Drugs & Supplements |
| BSW8 | Get Rich Quick |
| BSW9 | Free Gifts, Quizzes, & Surveys |
| BSW10 | Nudity |
| BSW11 | Cosmetic Procedures & Body Modification |

13.1 Supported Rich Media Frameworks

Table 13.3: Supported Rich Media Frameworks

| Description | Value |
|---------------------------|-------|
| Any framework is accepted | ALL |
| Adcentric | ac |
| Adinterax | ad |
| Adform | af |
| Atlas | at |
| Apivid | av |
| DoubleClick | dc |
| Eyeblaster | eb |
| EyeReturn | er |
| EyeWonder | ew |
| Flashtalking | ft |
| Klipmart | km |
| Kpsule | ks |
| MediaMind | mm |
| Mediaplex | mp |
| Piximedia | pm |
| PointRoll | pr |
| Pictela | pt |
| Rockabox | rb |
| Smart Adserver | sa |
| Silence Media | sm |
| Unicast | ui |
| Undertone | ut |
| Viewpoint | vp |
| Weborama | wo |

CHAPTER 14

SUPPLIER CUSTOM CATEGORIES

- *Dish Demographic Categories* (page 110)
- *Dish Program Types* (page 112)
- *GumGum Taxonomy 2016* (page 112)
- *YieldOne Inventory Category Mapping* (page 116)
- *YieldOne Product Category Mapping* (page 118)

14.1 Dish Demographics

Table 14.1: Dish Demographic Targeting Groups

| Value | Target Group |
|------------|----------------------------|
| A_18_PLUS | Adult Age 18+ (Year Old) |
| A_18_24 | Adult Age 18-24 (Year Old) |
| A_18_34 | Adult Age 18-34 (Year Old) |
| A_18_44 | Adult Age 18-44 (Year Old) |
| A_18_54 | Adult Age 18-54 (Year Old) |
| A_25_PLUS | Adult Age 25+ (Year Old) |
| A_25_54 | Adult Age 25-54 (Year Old) |
| A_35_PLUS | Adult Age 35+ (Year Old) |
| A_45_PLUS | Adult Age 45+ (Year Old) |
| A_55_PLUS | Adult Age 55+ (Year Old) |
| KIDS_0_10 | Children Age 0-10 |
| KIDS_NONE | Children Age 0-17 Blank |
| KIDS_11_15 | Children Age 11-15 |
| KIDS_16_17 | Children Age 16-17 |

Continued on next page

Table 14.1 – continued from previous page

| Value | Target Group |
|------------|---|
| COLLEGE | Education: Any Level of College (Adv) |
| GRADSCHOOL | Education: Graduate School (Adv) |
| HIGHSCHOOL | Education: High School or Less (Adv) |
| AFRICAN_AM | Ethnic Group: African Am (Code A) |
| ASIAN | Ethnic Group: Asian (B, C, D, H, I) |
| CAUCASIAN | Ethnic Group: Caucasian (E, G, K, L, J) |
| HISPANIC | Ethnic Group: Hispanic (Code Y) |
| NATIVE_AM | Ethnic Group: Native Am (Code F) |
| OTHER_ETH | Ethnic Group: Other (Code O or Blank) |
| F_18_PLUS | Female Age 18+ (Year Old) |
| F_18_24 | Female Age 18-24 (Year Old) |
| F_18_34 | Female Age 18-34 (Year Old) |
| F_18_44 | Female Age 18-44 (Year Old) |
| F_18_54 | Female Age 18-54 (Year Old) |
| F_25_PLUS | Female Age 25+ (Year Old) |
| F_25_54 | Female Age 25-54 (Year Old) |
| F_35_PLUS | Female Age 35+ (Year Old) |
| F_45_PLUS | Female Age 45+ (Year Old) |
| F_55_PLUS | Female Age 55+ (Year Old) |
| GEO_STATE | Geographic State Code |
| HH_OWNER | Home: Owner (Adv 3 or 4) |
| HH_RENTER | Home: Renter (Adv 1 or 2) |
| HHI_100150 | Income: \$100K - \$149,999 (Adv Target) |
| HHI_150_P | Income: \$150K or More (Adv Target) |
| HHI_LESS30 | Income: \$29,999 or Less (Adv Target) |
| HHI_30_75 | Income: \$30K - \$74,999 (Adv Target) |
| HHI_75_100 | Income: \$75K - \$99,999 (Adv Target) |
| SPANISH_SP | Language: Spanish (Code S8) |
| M_18_PLUS | Male Age 18+ (Year Old) |
| M_18_24 | Male Age 18-24 (Year Old) |
| M_18_34 | Male Age 18-34 (Year Old) |
| M_18_44 | Male Age 18-44 (Year Old) |
| M_18_54 | Male Age 18-54 (Year Old) |
| M_25_PLUS | Male Age 25+ (Year Old) |
| M_25_54 | Male Age 25-54 (Year Old) |
| M_35_PLUS | Male Age 35+ (Year Old) |
| M_45_PLUS | Male Age 45+ (Year Old) |
| M_55_PLUS | Male Age 55+ (Year Old) |
| HH_MARRIED | Marital Status: Married (Adv 1 or 3) |
| HH_SINGLE | Marital Status: Single (Adv 2 or 4) |

14.2 Dish Program Types

Table 14.2: Dish Program Types

| Value | Program Type |
|------------------|--|
| HOCKEY_DEC | Hockey Propensity Model |
| BASEBALL_DEC | Baseball Propensity Model |
| FOOTBALL_DEC | Football Propensity Model |
| SITCOM_DEC | Sitcom Propensity Model |
| AA_COMEDY_DEC | African Am Comedy Propensity Model |
| COMEDY_DEC | Comedy Propensity Model |
| WKDY_MORNING_DEC | Early AM Propensity Model |
| FIGHTING_DEC | Fighting Propensity Model |
| KIDS_DEC | Kids & Family Propensity Model |
| REAL_WOMEN_DEC | Real Women Propensity Model |
| COP_DEC | Cop Show Propensity Model |
| CULT_DEC | Cult Movie Propensity Model |
| REAL_ADV_DEC | Real Action/Adventure Propensity Model |
| HORROR_DEC | Horror Propensity Model |
| REAL_ADV_TR | Real Action/Adventure Traffic Ind |
| BASKETBALL_DEC | Basketball Propensity Model |
| REAL_MUSIC_DEC | Real Music Propensity Model |
| SOCCER_DEC | Soccer Propensity Model |
| SUN_AM_NEWS_DEC | Sunday AM News Propensity Model |
| GOLF_TENNIS_DEC | Golf & Tennis Propensity Model |
| DRAMA_DEC | Drama Propensity Model |
| PPV_DEC | PPV Propensity Model |
| ROMCOM_DEC | Romantic Comedy Propensity Model |
| SCI_FI_DEC | Sci-Fi Propensity Model |
| ACTION_DEC | Action Propensity Model |
| WWE_DEC | WWE Propensity Model |
| NASCAR_DEC | Nascar Propensity Model |
| INDY_DEC | Indy Propensity Model |

14.3 GumGum Taxonomy 2016

Table 14.3: GumGum Custom Taxonomy

| Event Identifier | Event Name | Starts At | Ends At | Days Before | Days After | Recur Years |
|------------------|------------|------------|------------|-------------|------------|-------------|
| GGE9-2 | Rose Bowl | 2016-01-01 | 2016-01-01 | 14 | 14 | 1 |
| GGE9-3 | Sugar Bowl | 2016-01-01 | 2016-01-01 | 14 | 14 | 1 |

Continued on next page

Table 14.3 – continued from previous page

| Event Identifier | Event Name | Starts At | Ends At | Days Before | Days After | Recur Years |
|------------------------|---------------------------------|------------|------------|-------------|------------|-------------|
| GGE1-9 | People’s Choice Awards | 2016-01-06 | 2016-01-06 | 14 | 14 | 1 |
| GGE5-1 | CES | 2016-01-06 | 2016-01-09 | 14 | 14 | 1 |
| GGE1-5 | Golden Globes | 2016-01-10 | 2016-01-10 | 14 | 14 | 1 |
| GGE9-1 | BCS National Championship | 2016-01-11 | 2016-01-11 | 14 | 14 | 1 |
| GGE1-3 | Critics’ Choice Awards | 2016-01-17 | 2016-01-17 | 14 | 14 | 1 |
| GGE7-2 | Sundance Film Festival | 2016-01-21 | 2016-01-31 | 14 | 14 | 1 |
| GGE21-1 | Australian Open | 2016-01-24 | 2016-02-01 | 30 | 30 | 1 |
| GGE22-2 | Winter X Games | 2016-01-28 | 2016-01-31 | 14 | 14 | 1 |
| GGE1-11 | SAG Awards | 2016-01-30 | 2016-01-30 | 14 | 14 | 1 |
| GGE1-7 | NAACP Awards | 2016-02-05 | 2016-02-05 | 14 | 14 | 1 |
| GGE9-4 | Super Bowl | 2016-02-07 | 2016-02-07 | 14 | 14 | 1 |
| GGE23-8 | Mardi Gras | 2016-02-09 | 2016-02-09 | 14 | 14 | 1 |
| GGE6-2 | NY Fashion Week | 2016-02-11 | 2016-02-18 | 14 | 14 | 1 |
| GGE11-1 | NBA All-Star Game | 2016-02-13 | 2016-02-13 | 14 | 14 | 1 |
| GGE23-12 | Valentine’s day | 2016-02-14 | 2016-02-14 | 14 | 14 | 1 |
| GGE3-5 | Grammy Awards | 2016-02-15 | 2016-02-15 | 14 | 14 | 1 |
| GGE12-1 | NASCAR Daytona 500 | 2016-02-17 | 2016-02-22 | 14 | 14 | 1 |
| GGE22-4 | X Games Europe | 2016-02-24 | 2016-02-28 | 14 | 14 | 0 |
| GGE1-1 | Academy Awards (Oscars) | 2016-02-28 | 2016-02-28 | 14 | 14 | 1 |
| GGE25-4 | Spring Break | 2016-03-01 | 2016-04-01 | 30 | 30 | 1 |
| GGE1-8 | Nickelodeon Kids’ Choice Awards | 2016-03-12 | 2016-03-12 | 14 | 14 | 1 |
| GGE11-6 | NCAA March Madness | 2016-03-15 | 2016-03-27 | 30 | 30 | 1 |
| GGE7-3 | SXSW | 2016-03-15 | 2016-03-19 | 14 | 14 | 1 |
| GGE23-11 | St. Patrick’s Day | 2016-03-17 | 2016-03-17 | 14 | 14 | 1 |
| GGE8-14 | Ultra Music Festival | 2016-03-18 | 2016-03-20 | 14 | 14 | 1 |
| GGE26-2 | Easter | 2016-03-27 | 2016-03-27 | 14 | 14 | 1 |
| GGE25-3 | Prom night | 2016-04-01 | 2016-05-01 | 30 | 30 | 1 |
| GGE11-4 | NCAA Final Four (Men) | 2016-04-02 | 2016-04-02 | 14 | 14 | 1 |
| GGE11-5 | NCAA Final Four (Women) | 2016-04-03 | 2016-04-05 | 14 | 14 | 1 |
| GGE14-4 | The Masters | 2016-04-04 | 2016-04-10 | 14 | 14 | 1 |
| GGE16-1 | NCAA Frozen Four | 2016-04-07 | 2016-07-09 | 14 | 14 | 1 |
| GGE2-1 | BAFTA Video Game Awards | 2016-04-07 | 2016-04-07 | 14 | 14 | 1 |
| GGE1-6 | MTV Movie Awards | 2016-04-10 | 2016-04-10 | 14 | 14 | 1 |
| Continued on next page | | | | | | |

Table 14.3 – continued from previous page

| Event Identifier | Event Name | Starts At | Ends At | Days Before | Days After | Recur Years |
|------------------------|-----------------------------------|------------|---------------|-------------|------------|-------------|
| GGE16-2 | Stanley Cup | 2016-04-13 | TBD July 2016 | 30 | 30 | 1 |
| GGE25-5 | Tax Filing | 2016-04-15 | 2016-04-15 | 14 | 14 | 1 |
| GGE8-3 | Coachella | 2016-04-15 | 2016-04-24 | 14 | 14 | 1 |
| GGE11-3 | NBA Playoffs | 2016-04-16 | 2016-06-01 | 30 | 30 | 1 |
| GGE17-1 | Boston Marathon | 2016-04-18 | 2016-04-18 | 14 | 14 | 1 |
| GGE23-4 | Earth Day | 2016-04-22 | 2016-04-22 | 14 | 14 | 1 |
| GGE3-2 | Billboard Latin Music Awards | 2016-04-27 | 2016-04-27 | 14 | 14 | 1 |
| GGE22-3 | X Games Asia | 2016-04-28 | 2016-05-01 | 14 | 14 | 1 |
| GGE8-12 | Stagecoach Country Music Festival | 2016-04-29 | 2016-05-01 | 14 | 14 | 1 |
| GGE25-2 | Graduation | 2016-05-01 | 2016-05-01 | 30 | 30 | 1 |
| GGE1-4 | Daytime Emmy Awards | 2016-05-01 | 2016-05-01 | 14 | 14 | 1 |
| GGE23-2 | Cinco de Mayo | 2016-05-05 | 2016-05-05 | 14 | 14 | 1 |
| GGE15-1 | Kentucky Derby | 2016-05-05 | 2016-05-08 | 14 | 14 | 1 |
| GGE23-9 | Mother's Day | 2016-05-08 | 2016-05-08 | 14 | 14 | 1 |
| GGE14-5 | The Players Championship | 2016-05-10 | 2016-05-15 | 14 | 14 | 1 |
| GGE8-11 | Sasquatch! | 2016-05-20 | 2016-05-22 | 14 | 14 | 1 |
| GGE20-1 | FA Cup | 2016-05-21 | 2016-05-21 | 30 | 30 | 1 |
| GGE3-3 | Billboard Music Awards | 2016-05-22 | 2016-05-22 | 14 | 14 | 1 |
| GGE21-2 | French Open | 2016-05-22 | 2016-06-05 | 30 | 30 | 1 |
| GGE24-3 | Memorial Day | 2016-05-30 | 2016-05-30 | 14 | 14 | 1 |
| GGE11-2 | NBA Finals | 2016-06-02 | 2016-06-02 | 30 | 30 | 1 |
| GGE22-1 | Summer X Games | 2016-06-02 | 2016-06-05 | 14 | 14 | 1 |
| GGE8-7 | Governor's Ball | 2016-06-03 | 2016-06-05 | 14 | 14 | 1 |
| GGE3-4 | CMT Music Awards | 2016-06-08 | 2016-06-08 | 14 | 14 | 1 |
| GGE14-2 | LPGA Championship | 2016-06-09 | 2016-06-12 | 14 | 14 | 1 |
| GGE8-2 | Bonnaroo Festival | 2016-06-09 | 2016-06-12 | 14 | 14 | 1 |
| GGE14-7 | US Open | 2016-06-16 | 2016-06-19 | 14 | 14 | 1 |
| GGE8-6 | Firefly | 2016-06-16 | 2016-06-19 | 14 | 14 | 1 |
| GGE10-1 | College World Series | 2016-06-17 | 2016-06-29 | 30 | 30 | 1 |
| GGE8-4 | Electric Daisy Carnival | 2016-06-17 | 2016-06-19 | 14 | 14 | 1 |
| GGE23-5 | Father's Day | 2016-06-19 | 2016-06-19 | 14 | 14 | 1 |
| GGE1-2 | BET Awards | 2016-06-23 | 2016-06-26 | 14 | 14 | 1 |
| GGE21-3 | Wimbledon | 2016-06-27 | 2016-07-10 | 30 | 30 | 1 |
| GGE13-1 | Tour de France | 2016-07-02 | 2016-07-05 | 30 | 30 | 1 |
| GGE24-1 | Independence Day | 2016-07-04 | 2016-07-04 | 14 | 14 | 1 |
| Continued on next page | | | | | | |

Table 14.3 – continued from previous page

| Event Identifier | Event Name | Starts At | Ends At | Days Before | Days After | Recur Years |
|------------------|-----------------------------------|------------|------------|-------------|------------|-------------|
| GGE10-3 | MLB All-Star Game | 2016-07-12 | 2016-07-12 | 14 | 14 | 1 |
| GGE4-1 | ESPN ESPYS | 2016-07-13 | 2016-07-13 | 14 | 14 | 1 |
| GGE14-1 | British Open | 2016-07-14 | 2016-07-17 | 14 | 14 | 1 |
| GGE7-1 | Comicon | 2016-07-21 | 2016-07-24 | 14 | 14 | 1 |
| GGE8-13 | Tomorrowland | 2016-07-22 | 2016-07-24 | 14 | 14 | 1 |
| GGE14-8 | US PGA Championship | 2016-07-28 | 2016-07-31 | 14 | 14 | 1 |
| GGE8-9 | Lollapalooza | 2016-07-29 | 2016-07-31 | 14 | 14 | 1 |
| GGE8-8 | HARDfest | 2016-07-30 | 2016-07-31 | 14 | 14 | 1 |
| GGE25-1 | Back to School | 2016-08-01 | 2016-09-01 | 30 | 30 | 1 |
| GGE18-1 | Summer Olympics | 2016-08-05 | 2016-08-21 | 30 | 30 | 4 |
| GGE8-10 | Outside Lands | 2016-08-05 | 2016-08-07 | 14 | 14 | 1 |
| GGE1-12 | Teen Choice Awards | 2016-08-14 | 2016-08-14 | 14 | 14 | 1 |
| GGE10-2 | Little League World Series | 2016-08-18 | 2016-08-28 | 14 | 14 | 1 |
| GGE3-6 | MTV Video Music Awards | 2016-08-28 | 2016-08-28 | 14 | 14 | 1 |
| GGE21-4 | US Open | 2016-08-29 | 2016-09-11 | 30 | 30 | 1 |
| GGE8-5 | Electric Zoo Festival | 2016-09-02 | 2016-09-04 | 14 | 14 | 1 |
| GGE24-2 | Labor Day | 2016-09-05 | 2016-09-05 | 14 | 14 | 1 |
| GGE1-10 | Primetime Emmy Awards | 2016-09-18 | 2016-09-18 | 14 | 14 | 1 |
| GGE14-3 | PGA Ryder Cup | 2016-09-27 | 2016-10-02 | 14 | 14 | 1 |
| GGE8-1 | Austin City Limits Music Festival | 2016-09-30 | 2016-10-11 | 14 | 14 | 1 |
| GGE10-4 | MLB World Series | 2016-10-27 | 2016-11-04 | 30 | 30 | 1 |
| GGE23-6 | Halloween | 2016-10-31 | 2016-10-31 | 14 | 14 | 1 |
| GGE6-3 | Victoria's Secret Fashion Show | 2016-11-22 | 2016-11-22 | 14 | 14 | 1 |
| GGE24-4 | Thanksgiving | 2016-11-24 | 2016-11-24 | 14 | 14 | 1 |
| GGE23-1 | Black Friday | 2016-11-25 | 2016-11-25 | 14 | 14 | 1 |
| GGE23-3 | Cyber Monday | 2016-11-28 | 2016-11-28 | 14 | 14 | 1 |
| GGE26-3 | Hanukkah | 2016-12-24 | 2017-01-01 | 14 | 14 | 1 |
| GGE26-1 | Christmas | 2016-12-25 | 2016-12-25 | 14 | 14 | 1 |
| GGE23-7 | Kwanzaa | 2016-12-26 | 2017-01-01 | 14 | 14 | 1 |
| GGE23-10 | New Year's Eve | 2016-12-31 | 2016-12-31 | 14 | 14 | 1 |
| GGE19-1 | America's Cup | 2017-06-17 | 2017-06-27 | 30 | 30 | 4 |
| GGE14-6 | Presidents Cup | 2017-09-26 | 2017-10-01 | 14 | 14 | 1 |
| GGE18-2 | Winter Olympics | 2018-02-09 | 2018-02-25 | 30 | 30 | 4 |
| GGE20-2 | World Cup | 2018-06-14 | 2018-07-15 | 30 | 30 | 1 |

Continued on next page

Table 14.3 – continued from previous page

| Event Identifier | Event Name | Starts At | Ends At | Days Before | Days After | Recur Years |
|------------------|-----------------------|-------------------|-------------------|-------------|------------|-------------|
| GGE3-1 | American Music Awards | TBD November 2016 | TBD November 2016 | 14 | 14 | 1 |
| GGE6-1 | LA Fashion Week | TBD October 2016 | TBD October 2016 | 14 | 14 | 1 |

14.4 YieldOne Inventory Category Mapping

Table 14.4: YieldOne Inventory Category Mapping

| IAB Category | YieldOne Category | Parent Category | Child Category |
|--------------|-------------------|--------------------|-----------------------------------|
| IAB 19-35 | 1 | Information search | Keyword search & directory |
| IAB 19-35 | 2 | Information search | Translation & dictionary |
| IAB 19-35 | 3 | Information search | Geographic Maps |
| IAB 19-35 | 4 | Information search | Airlines, Railway & Road |
| IAB 22-3 | 5 | Information search | Product & Price compare |
| IAB 12 | 6 | News & Business | General News |
| IAB 12-1 | 7 | News & Business | International, politics & society |
| IAB 3 | 8 | News & Business | Business, Economy & Finance |
| IAB 3 | 9 | News & Business | Investment |
| IAB 12 | 10 | News & Business | Weather |
| IAB 12 | 11 | News & Business | Culture & Arts |
| IAB 12 | 12 | News & Business | IT |
| IAB 12 | 13 | News & Business | Other news, column |
| IAB 17-2 | 14 | Sport | Baseball |
| IAB 17-12 | 15 | Sport | Football |
| IAB 17-15 | 16 | Sport | Golf |
| IAB 17-20 | 17 | Sport | Martial Arts |
| IAB 17 | 18 | Sport | Marine Sports |
| IAB 17 | 19 | Sport | Winter sports |
| IAB 17 | 20 | Sport | Other Sports |
| IAB 21 | 21 | Lifestyle | Real Estate |
| IAB 10-7 | 22 | Lifestyle | Interior & household goods |
| IAB 8 | 23 | Lifestyle | Gourmet & Food |
| IAB 23 | 24 | Lifestyle | Regional and local |
| IAB 24 | 25 | Lifestyle | Psychological & divination |
| IAB 18-1 | 26 | Lifestyle | Beauty & Cosmetics |
| IAB 18-3 | 27 | Lifestyle | Fashion |
| IAB 14-4 | 28 | Lifestyle | Love & Marriage |
| IAB 6 | 29 | Lifestyle | Child birth & care |

Continued on next page

Table 14.4 – continued from previous page

| IAB Category | YieldOne Category | Parent Category | Child Category |
|--------------|-------------------|--------------------------|--|
| IAB 2 | 30 | Cars & vehicles | Vehicle Information |
| IAB 2 | 31 | Cars & vehicles | Bike Information |
| IAB 2 | 32 | Cars & vehicles | Ships and airplanes |
| IAB 1-6 | 33 | Hobbies & Entertainment | Music |
| IAB 1-5 | 34 | Hobbies & Entertainment | Film & theater |
| IAB 9 | 35 | Hobbies & Entertainment | Variety |
| IAB 9-30 | 36 | Hobbies & Entertainment | Game |
| IAB 24 | 37 | Hobbies & Entertainment | Gambling |
| IAB 9-11 | 38 | Hobbies & Entertainment | Anime & Comic |
| IAB 1-1 | 39 | Hobbies & Entertainment | Magazines |
| IAB 9-23 | 40 | Hobbies & Entertainment | Cameras & AV equipment |
| IAB 1-7 | 41 | Hobbies & Entertainment | TV |
| IAB 16 | 42 | Hobbies & Entertainment | Pet |
| IAB 9 | 43 | Hobbies & Entertainment | Other Hobbies & Entertainment |
| IAB 25-3 | 44 | Hobbies & Entertainment | Gravure & Adult |
| IAB 20 | 45 | Travel, Leisure & Events | Travel & Hotels |
| IAB 9 | 46 | Travel, Leisure & Events | Leisure, Resort & Outdoor |
| IAB 9 | 47 | Travel, Leisure & Events | Fishing |
| IAB 7 | 48 | Health care | Health & medical care |
| IAB 5 | 49 | Education & Career | School, Education & License |
| IAB 4 | 50 | Education & Career | job |
| IAB 5-3 | 51 | Education & Career | Art |
| IAB 4 | 52 | Education & Career | History, Languages, Literature, Philosophy, Religion |
| IAB 4 | 53 | Education & Career | Social science |
| IAB 4 | 54 | Education & Career | Science |
| IAB 4 | 55 | Education & Career | Engineering technology |

Continued on next page

Table 14.4 – continued from previous page

| IAB Category | YieldOne Category | Parent Category | Child Category |
|--------------|-------------------|-----------------|-------------------|
| IAB 22 | 56 | Online shopping | Online shopping |
| IAB 22 | 57 | Online shopping | Auction |
| IAB 19 | 58 | Content service | Video |
| IAB 19 | 59 | Content service | Image & Design |
| IAB 19 | 60 | Content service | Music & Ring tone |
| IAB 19 | 61 | Content service | Game |
| IAB 19 | 62 | Content service | Software |
| IAB 19-23 | 63 | Community | Mail Services |
| IAB 19-23 | 64 | Community | ML, Chat & Forum |
| IAB 19-34 | 65 | Community | Homepage Services |
| IAB 14-1 | 66 | Community | Dating |
| IAB 19 | 67 | Community | Targeted & Opt In |
| IAB 19 | 68 | Community | Present & prizes |
| IAB 19 | 69 | Community | Questionnaire |
| IAB 19-23 | 70 | Community | Blog |

14.5 YieldOne Product Category Mapping

Table 14.5: YieldOne Product Category Mapping

| IAB cat | IAB Description | Category | Product | Product Category |
|----------|------------------------|----------|---------------------|---|
| IAB19-22 | MP3/MIDI | 19 | Electric appliances | Audio products |
| IAB19-22 | MP3/MIDI | 20 | Electric appliances | Digital audio players |
| IAB19-17 | Home Video/DVD | 21 | Electric appliances | Plasma display TVs/liquid crystal display TVs |
| IAB19-17 | Home Video/DVD | 22 | Electric appliances | DVD players/recorders |
| IAB19-5 | Cameras & Camcorders | 23 | Electric appliances | Cameras |
| IAB19-5 | Cameras & Camcorders | 24 | Electric appliances | Digital cameras |
| IAB19-5 | Cameras & Camcorders | 25 | Electric appliances | Video cameras |
| IAB19 | Technology & Computing | 26 | Electric appliances | PCs |
| IAB3-4 | Business Software | 27 | Electric appliances | PC software |
| IAB19-9 | Computer Peripherals | 28 | Electric appliances | Printers |
| IAB19 | Technology & Computing | 29 | Electric appliances | Telephones/facsimiles |

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Table 14.5 – continued from previous page

| IAB cat | IAB Description | Category | Product | Product Category |
|----------|---------------------------|----------|---------------------------------------|--|
| IAB19-9 | Computer Peripherals | 30 | Electric appliances | PC peripheral equipment |
| IAB19-9 | Computer Peripherals | 31 | Electric appliances | Scanners |
| IAB19-28 | Portable | 32 | Electric appliances | Portable software |
| IAB19 | Technology & Computing | 33 | Electric appliances | Electronic dictionaries |
| IAB19-9 | Computer Peripherals | 34 | Electric appliances | Batteries |
| IAB2-2 | Auto Repair | 35 | Transportation equipment/supplies | Automobiles/ motorcycles/ after-purchase servicing |
| IAB2-15 | Motorcycles | 36 | Transportation equipment/supplies | Motorcycles |
| IAB17-3 | Bicycling | 37 | Transportation equipment/supplies | Vehicles |
| IAB2 | Automotive | 38 | Transportation equipment/supplies | Passenger vehicles |
| IAB20 | Travel | 39 | Transportation equipment/supplies | Car navigation systems |
| IAB2-21 | Trucks & Accessories | 40 | Transportation equipment/supplies | Automobile supplies |
| IAB2-21 | Trucks & Accessories | 41 | Transportation equipment/supplies | Motorcycle supplies |
| IAB19 | Technology & Computing | 42 | Accurate instruments | Semiconductors |
| IAB19 | Technology & Computing | 43 | Accurate instruments | Medical equipment |
| IAB19 | Technology & Computing | 44 | Accurate instruments | Industrial parts |
| IAB10-1 | Appliances | 45 | Commercial equipment/office supplies | Office supplies |
| IAB10-9 | Remodeling & Construction | 46 | Commercial equipment/office supplies | Office furniture |
| IAB18-5 | Clothing | 47 | Commercial equipment/office supplies | Office wear/ uniforms/ footwear |
| IAB19-9 | Computer Peripherals | 48 | Commercial equipment/office supplies | OA supplies/toner |
| IAB10-1 | Appliances | 49 | Commercial equipment/ office supplies | Business equipment |
| IAB4-7 | Nursing | 50 | Household equipment/ supplies | Nursing services/nursing care products |

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| IAB cat | IAB Description | Category | Product | Product Category |
|----------|----------------------------|----------|--------------------------------|---|
| IAB10-7 | Interior Decorating | 51 | Household equip-ment/supplies | Home DIY tools |
| IAB10-7 | Interior Decorating | 52 | Household equip-ment/supplies | Furniture/ interior goods |
| IAB10-1 | Appliances | 53 | Household equip-ment/ supplies | Household equip-ment |
| IAB10-1 | Appliances | 54 | Household equip-ment/ supplies | HVAC equipment |
| IAB10-1 | Appliances | 55 | Household equip-ment/ supplies | Kitchen electric ap-pliance |
| IAB10-1 | Appliances | 56 | Household equip-ment/ supplies | Daily electric ap-pliance(vacuum cleaners, washing machines, clothes irons, etc.) |
| IAB10-9 | Remodeling & Con-struction | 57 | Household equip-ment/ supplies | Renovation |
| IAB16 | Pets | 58 | Hobby/ leisure goods | Pet supplies |
| IAB1-6 | Music | 59 | Hobby/ leisure goods | Musical instrument |
| IAB9 | Hobbies & Interests | 60 | Hobby/ leisure goods | Toys |
| IAB17-32 | Saltwater Fishing | 61 | Hobby/ leisure goods | Fishing supplies |
| IAB19-17 | Home Video/ DVD | 62 | Hobby/ leisure goods | Visual soft-ware(video, DVD, etc.) |
| IAB1-6 | Music | 63 | Hobby/ leisure goods | Audio software(CD, MD, etc.) |
| IAB9-30 | Video & Computer Games | 64 | Hobby/ leisure goods | Portable video game units |
| IAB9-30 | Video & Computer Games | 65 | Hobby/ leisure goods | Household video game units |
| IAB9-30 | Video & Computer Games | 66 | Hobby/ leisure goods | Video game software |
| IAB17 | Sports | 67 | Hobby/ leisure goods | Sports equipment |
| IAB9-32 | Video & Computer Games | 68 | Hobby/ leisure goods | Online games |
| IAB3 | Business | 69 | Energy/ raw materi-als | Gasoline |
| IAB3 | Business | 70 | Energy/ raw materi-als | Gas |
| IAB3 | Business | 71 | Energy/ raw materi-als | Electricity |
| IAB3 | Business | 72 | Energy/ raw materi-als | Wind-power genera-tion |

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| IAB cat | IAB Description | Category | Product | Product Category |
|---------|---------------------------|----------|---------------------------------------|--|
| IAB3 | Business | 73 | Energy/ raw materials | Solar power generation |
| IAB3 | Business | 74 | Energy/ raw materials | Nuclear power generation |
| IAB3 | Business | 75 | Energy/ raw materials | Hydraulic power generation |
| IAB8-12 | Health/ Lowfat Cooking | 76 | Medicine/ hygiene products | Specified health food |
| IAB8-12 | Health/ Lowfat Cooking | 77 | Medicine/ hygiene products | Health drink(nutritional supplements) |
| IAB7 | Health & Fitness | 78 | Medicine/ hygiene products | Drugs and medicines |
| IAB7 | Health & Fitness | 79 | Medicine/ hygiene products | Contact lenses |
| IAB7 | Health & Fitness | 80 | Cosmetics/ denti- frice/ detergent | Grooming products |
| IAB18-1 | Beauty | 81 | Cosmetics/ denti- frice/ detergent | Body-care products |
| IAB7-17 | Dental Care | 82 | Cosmetics/ denti- frice/ detergent | Toothpastes/ tooth- brushes |
| IAB18-1 | Beauty | 83 | Cosmetics/ denti- frice/ detergent | Hair care products |
| IAB18-1 | Beauty | 84 | Cosmetics/ denti- frice/ detergent | Cosmetics |
| IAB8-12 | Health/ Lowfat Cooking | 85 | Cosmetics/ denti- frice/ detergent | Healthcare products |
| IAB8 | Food & Drink | 86 | Food products | Fresh food products |
| IAB16 | Pets | 87 | Food products | Pet food products |
| IAB8 | Food & Drink | 88 | Food products | Condiments/ pro- cessed food products |
| IAB8-12 | Health/ Lowfat Cooking | 89 | Food products | Health food products |
| IAB8-8 | Desserts & Baking | 90 | Beverages/ luxury grocery items | Confectioneries |
| IAB8 | Food & Drink | 91 | Beverages/ luxury grocery items | Alcoholic bever- ages(whiskey, beer, refined sake, etc.) |
| IAB8 | Food & Drink | 92 | Beverages/ luxury grocery items | Cold bever- ages(juice, coke, etc.) |
| IAB8-6 | Coffee/ Tea | 93 | Beverages/ luxury grocery items | Sugar-free drinks(tea, min- eral water, etc.) |

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Table 14.5 – continued from previous page

| IAB cat | IAB Description | Category | Product | Product Category |
|----------|----------------------|----------|---------------------------------|--|
| IAB8-6 | Coffee/ Tea | 94 | Beverages/ luxury grocery items | Coffee beverages |
| IAB9-9 | Cigars | 95 | Beverages/ luxury grocery items | Cigarettes |
| IAB10-1 | Appliances | 96 | Textiles/ personal effects | Detergents |
| IAB10-1 | Appliances | 97 | Textiles/ personal effects | Kitchen equipment |
| IAB18-5 | Clothing | 98 | Textiles/ personal effects | Personal effects(clothes) |
| IAB18-6 | Accessories | 99 | Textiles/ personal effects | Personal effects(jewelry, accessories) |
| IAB10 | Home & Garden | 100 | Textiles/ personal effects | Bedding |
| IAB10 | Home & Garden | 101 | Textiles/ personal effects | Fragrance/ air fresheners |
| IAB6-2 | Babies & Toddlers | 102 | Textiles/ personal effects | Baby products |
| IAB18 | Style & Fashion | 103 | Textiles/ personal effects | Laundry services |
| IAB9-23 | Photography | 104 | Publications | Photographic development services |
| IAB12 | News | 105 | Publications | Newspapers |
| IAB19-13 | Desktop Publishing | 106 | Publications | Printing services |
| IAB1-1 | Books & Literature | 107 | Publications | Books/ magazines |
| IAB13 | Personal Finance | 108 | Finance/ insurance/ securities | Banks/ securities |
| IAB13-2 | Credit/ Debt & Loans | 109 | Finance/ insurance/ securities | Credit cards |
| IAB13-2 | Credit/ Debt & Loans | 110 | Finance/ insurance/ securities | Consumer finance |
| IAB13-6 | Insurance | 111 | Finance/ insurance/ securities | Life insurance/ non-life insurance |
| IAB13-11 | Stocks | 112 | Finance/ insurance/ securities | Online securities |
| IAB13-8 | Mutual Funds | 113 | Finance/ insurance/ securities | Financial commodities |
| IAB13-5 | Hedge Fund | 114 | Finance/ insurance/ securities | Investment products(except finance) |
| IAB13 | Personal Finance | 115 | Finance/ insurance/ securities | Online banks |
| IAB13 | Personal Finance | 116 | Finance/ insurance/ securities | Electronic money |

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Table 14.5 – continued from previous page

| IAB cat | IAB Description | Category | Product | Product Category |
|------------------------|---------------------------|----------|--|---|
| IAB22 | Shopping | 117 | Department stores/ shops/ commercial firms | Convenience stores |
| IAB22 | Shopping | 118 | Department stores/ shops/ commercial firms | Guides for electron- ics retail stores |
| IAB22 | Shopping | 119 | Department stores/ shops/ commercial firms | Guides for depart- ment stores |
| IAB22 | Shopping | 120 | Department stores/ shops/ commercial firms | Guides for supermar- kets |
| IAB21 | Real Estate | 121 | Real estate/ con- struction | Real estate for resi- dential housing, con- dominiums, etc. |
| IAB20 | Travel | 122 | Transportation/ sightseeing/ amuse- ment | Domestic travel in- formation |
| IAB20 | Travel | 123 | Transportation/ sightseeing/ amuse- ment | Overseas travel infor- mation |
| IAB20-3 | Air Travel | 124 | Transportation/ sightseeing/ amuse- ment | Air ticket informa- tion |
| IAB20-25 | Theme Parks | 125 | Transportation/ sightseeing/ amuse- ment | Leisure facil- ity(amusement parks, etc.) |
| IAB1-5 | Movies | 126 | Transportation/ sightseeing/ amuse- ment | Guides for movies, dramas, etc. |
| IAB1 | Arts & Entertain- ment | 127 | Transportation/ sightseeing/ amuse- ment | Events informa- tion(concerts, etc.) |
| IAB20 | Travel | 128 | Transportation/ sightseeing/ amuse- ment | Rental cars |
| IAB20 | Travel | 129 | Transportation/ sightseeing/ amuse- ment | Transportation ser- vices |
| IAB3-10 | Logistics | 130 | Transportation/ sightseeing/ amuse- ment | Delivery services |
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Table 14.5 – continued from previous page

| IAB cat | IAB Description | Category | Product | Product Category |
|------------------------|-------------------------|----------|--|---|
| IAB3-10 | Logistics | 131 | Transportation/ sightseeing/ amusement | Moving services |
| IAB8 | Food & Drink | 132 | Transportation/ sightseeing/ amusement | Food services |
| IAB17 | Sports | 133 | Transportation/ sightseeing/ amusement | Sports events information |
| IAB20-18 | Hotels | 134 | Transportation/ sightseeing/ amusement | Hotels/ accommodations |
| IAB17-15 | Golf | 135 | Transportation/ sightseeing/ amusement | Golf memberships |
| IAB7-1 | Exercise | 136 | Transportation/ sightseeing/ amusement | Sports gyms |
| IAB13-2 | Credit/ Debt & Loans | 137 | Transportation/ sightseeing/ amusement | Car leasing |
| IAB11 | Law, Gov't & Politics | 138 | Government office/ municipality/ religious organizations | Political bodies |
| IAB11 | Law, Gov't & Politics | 139 | Government office/ municipality/ religious organizations | Economic groups |
| IAB11 | Law, Gov't & Politics | 140 | Government office/ municipality/ religious organizations | Independent Administrative Institutions |
| IAB11 | Law, Gov't & Politics | 141 | Government office/ municipality/ religious organizations | Nonprofit organizations |
| IAB11 | Law, Gov't & Politics | 142 | Government office/ municipality/ religious organizations | Public office |
| IAB5 | Education | 143 | Educational services/ universities, etc. | Seminars/ lectures |
| IAB5 | Education | 144 | Educational services/ universities, etc. | Learning materials |
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| IAB cat | IAB Description | Category | Product | Product Category |
|----------|------------------------|----------|---|---|
| IAB5-6 | Distance Learning | 145 | Educational services/ universities, etc. | Overseas educational programs/ working holiday programs |
| IAB5-1 | 7-12 Education | 146 | Educational services/ universities, etc. | Elementary schools/ junior high schools |
| IAB5 | Education | 147 | Educational services/ universities, etc. | High schools |
| IAB5-5 | College Life | 148 | Educational services/ universities, etc. | Universities |
| IAB5 | Education | 149 | Educational services/ universities, etc. | Private tutoring schools |
| IAB5 | Education | 150 | Educational services/ universities, etc. | Correspondence education |
| IAB5 | Education | 151 | Educational services/ universities, etc. | Career colleges/ vocational schools |
| IAB5 | Education | 152 | Educational services/ universities, etc. | Qualifying examinations |
| IAB19-6 | Cell Phones | 153 | Telecom/ telecommunications | Personal Handy-phone System |
| IAB1-7 | Television | 154 | Telecom/ telecommunications | Show public relations |
| IAB19-6 | Cell Phones | 155 | Telecom/ telecommunications | Mobile phones(except PHS) |
| IAB19-6 | Cell Phones | 156 | Telecom/ telecommunications | Communication services(telephones) |
| IAB19-18 | Internet Technology | 157 | Telecom/ telecommunications | Communication services(internet) |
| IAB19 | Technology & Computing | 158 | Information handling services/ software companies | Application software |
| IAB19 | Technology & Computing | 159 | Information handling services/ software companies | Information handling services |
| IAB19 | Technology & Computing | 160 | Information handling services/ software companies | Server related |

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Table 14.5 – continued from previous page

| IAB cat | IAB Description | Category | Product | Product Category |
|----------|------------------------|----------|---|---|
| IAB19 | Technology & Computing | 161 | Information handling services/ software companies | Storage related |
| IAB19-8 | Computer Networking | 162 | Information handling services/ software companies | Networking equipment |
| IAB4 | Careers | 163 | Temporary-employment agencies/ recruitment companies | Job/ job-transfer/ part-time job information |
| IAB4 | Careers | 164 | Temporary-employment agencies/ recruitment companies | Temporary-employment agencies/ recruitment companies |
| IAB19-18 | Internet Technology | 165 | Information websites/ e-mail services | Introduction of web services |
| IAB11-2 | Legal Issues | 166 | Other business services | Legal services(law firms, etc.) |
| IAB13-12 | Tax Planning | 167 | Other business services | Accounting services(certified public accountants, etc.) |
| IAB24 | Uncategorized | 168 | Other business services | Funeral services |
| IAB19 | Technology & Computing | 169 | Other business services | Telegrams |
| IAB3-10 | Logistics | 170 | Other business services | Postal services |
| IAB7 | Health & Fitness | 171 | Hospitals/ esthetic clinics/ hair salons | Health services |
| IAB18-1 | Beauty | 172 | Hospitals/ esthetic clinics/ hair salons | Beauty services |
| IAB7 | Health & Fitness | 173 | Hospitals/ esthetic clinics/ hair salons | Hospitals |
| IAB18-1 | Beauty | 174 | Hospitals/ esthetic clinics/ hair salons | Hair salons/ barbers |
| IAB18-1 | Beauty | 175 | Hospitals/ esthetic clinics/ hair salons | Esthetic salons |
| IAB22 | Shopping | 176 | Catalog companies | Mail-order services |
| IAB14-4 | Marriage | 177 | Marriage information companies | Marriage information services |
| IAB14-4 | Marriage | 178 | Marriage information companies | Wedding services |
| IAB9-23 | Photography | 179 | Others | Photography services |

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| IAB cat | IAB Description | Category | Product | Product Category |
|----------|----------------------|----------|---|---|
| IAB2-3 | Buying/ Selling Cars | 180 | Others | Secondhand dealers/ appraisal services(vehicles, motorcycles) |
| IAB9 | Hobbies & Interests | 181 | Others | Secondhand dealers/ appraisal services(CD, DVD, books, games.) |
| IAB10-1 | Appliances | 182 | Others | Secondhand dealers/ appraisal services(PCs, home electrical appliances) |
| IAB10-5 | Home Repair | 183 | Others | House cleaning |
| IAB25 | Non-Standard Content | 184 | Others | Bicycle racing |
| IAB25 | Non-Standard Content | 185 | Others | Motorcycle racing |
| IAB22 | Shopping | 186 | Others | Gift cards |
| IAB3-1 | Advertising | 187 | Others | Enterprises public relations |
| IAB24 | Uncategorized | 188 | Others | Charities |
| IAB10-3 | Environmental Safety | 189 | Others | Ecology |
| IAB1-7 | Television | 190 | Others | Pay broadcasting |
| IAB9 | Hobbies & Interests | 191 | Others | Fortune-telling services |
| IAB25 | Non-Standard Content | 192 | Others | Japanese pinball |
| IAB25 | Non-Standard Content | 193 | Others | Horse racing |
| IAB25 | Non-Standard Content | 194 | Others | Motorboat racing |
| IAB3-1 | Advertising | 195 | Others | Prize advertisements |
| IAB9 | Hobbies & Interests | 196 | Others | Lotteries |
| IAB19-25 | Network Security | 197 | Others | Security services |
| IAB24 | Uncategorized | 198 | Others | Secondhand dealers/ appraisal services(others) |
| IAB12-3 | Local News | 199 | Others | Recall |
| IAB2 | Automotive | 200 | Civil engineering/ construction equipment | Shovel dozers |
| IAB24 | Uncategorized | 1001 | DoubleClickBid Manager | DoubleClickBid Manager |

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Table 14.5 – continued from previous page

| IAB cat | IAB Description | Category | Product | Product Category |
|---------|-----------------|----------|-------------|------------------|
| IAB24 | Uncategorized | 1002 | CRITEO | CRITEO |
| IAB24 | Uncategorized | 1003 | BrandScreen | BrandScreen |
| IAB24 | Uncategorized | 1004 | Turn | Turn |