

[EXTERNAL EXPORT] Impression Tracking

This document describes the approach of tracking immersions in SDK.

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Managed impression beacons

SDK tracks several kinds of impression beacons

- VAST, provided in the code of creative
- Open Measurement, provided in the code of creative and managed by OM SDK
- **burl** is not supported yet

VAST beacon

The VAST impression beacon is an URL that comes within the VAST container in the **<Impression>** Element. For details see [VAST Specification](#).

```
<Impression>
  <![CDATA[http://delivery-us-west-1.openx.net/v/1.0/ri?ph=a51065ab-
17ee-4394-b5a7-
32debc04780a&ts=2DAABBgABAAECAAIbAAsAAgAAAKIcGApnZ2F4WHVrYk1DHBaVyLXAwM3
d_MEBFuv6_vzrq8-
r3gEAHBbD5M2Yj6L3o5YBFvu9rqjQtNHF4QEAfvTl_bsLFQIAHBQCFAIAHBwVAgAcFQIAABw
mhrjdgqQVBhUGJsrysoAEFp6LoYAE1qwCABwmpouhgAQW_r64gAQW4LndggQW0rndggQVBhw
UwAcUgAUAFQQVChasAiasAkUKAAAA&vtqe=false]]>
</Impression>
```

Important: according to the VAST specification, a single ad might contain several impression beacons:

- Multiple **<Impression>** elements. The VAST file might contain several **<Impression>** but each of them will contain only one URL.
- **Wrapped ads**, when one VAST file could contain another one and each of them might contain its own set of **<Impression>** elements

So, basically, the ad can fire several impression beacons when [the time comes](#).

Note: the companion ad (EndCard) does not have facilities to track its own impression.

OMSDK beacon

If the ad, no matter display or video, contains an Open Measurement tag the SDK will fire an impression beacon from this tag when [the time comes](#).

MRAID beacon

There are no strict instructions on how the impression should be fired inside MRAID creative. Moreover, the approaches of tracking impressions are different in MRAID 2.0 and MRAID 3.0.

According to the best practices and bits of advice, the impression tracking in the MRAID ad should (but mustn't) be based on the **mraid.isViewable()**. The SDK informs the ad via MRAID when it becomes rendered with **mraid.viewableChange()**. After that, the ad should check the **mraid.isViewable()** and track an impression:

```
if ( mraid.viewableChangeEventWasDetected() )
    if( mraid.isViewable() == true)
        fireMyImpressionTrackers();
    else if ( mraid.isViewable() == false)
        doNothing();
```

The actual time of changing the MRAID viewability property is shown in the [Time Diagram](#) section.

The Kind of Impressions

The SDK tracks the "Begin to render" impression.

There are several guidelines about how to measure the viewability of the ad.

- [MRC Mobile Viewable Ad Impression Measurement Guidelines](#).
- [Mobile Application Advertising Measurement Guidelines](#)

According to these guides

Ad Impression

Ad Impression: A measurement of responses from an ad delivery system to an ad request from the user's device, which is filtered for invalid traffic and is recorded at a point as late as possible in the process of delivery of the creative material to the user's device. The ad must be loaded and at minimum begin to render in order to count it as a valid ad impression. Measurement of begin to render should include logical components necessary to display the ad, but does not necessarily include logical elements that are not essential (such as other tracking elements).

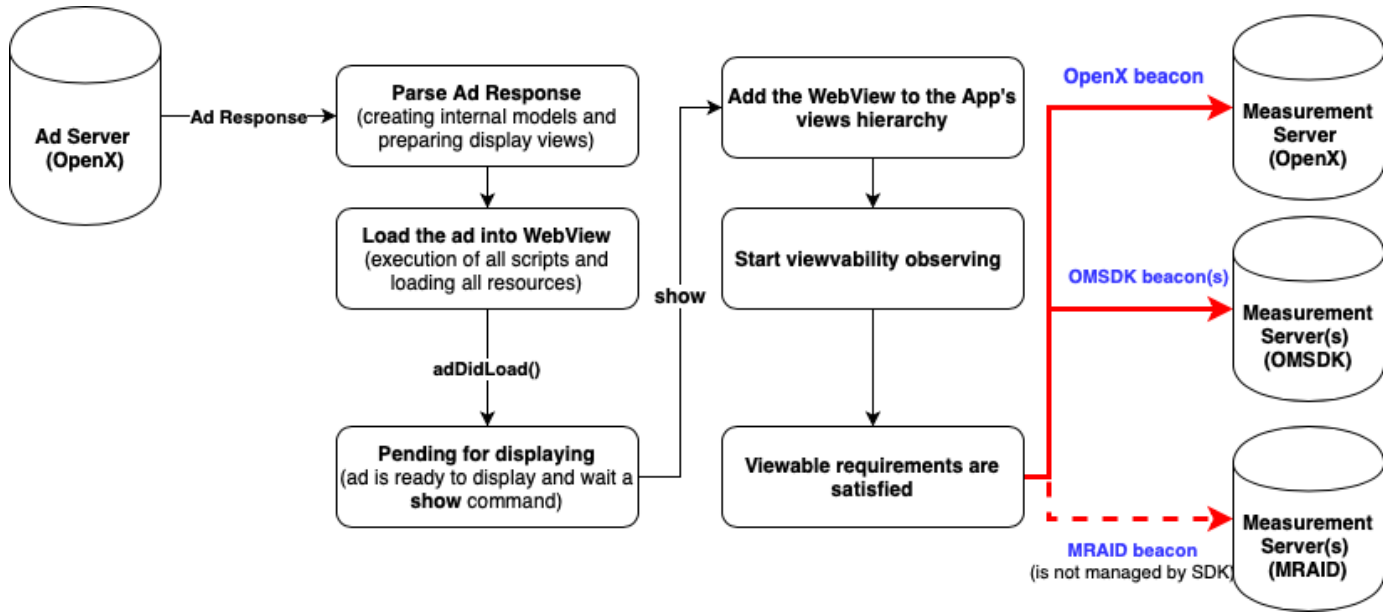
In the context of the guidance above, "loaded" means the logical creative file has been transmitted and received at the client-side (user device) and "render" refers to the process of painting the creative file or adding it to any portion of the Document Object Model.

So that we start to track render impression according to the next requirements:

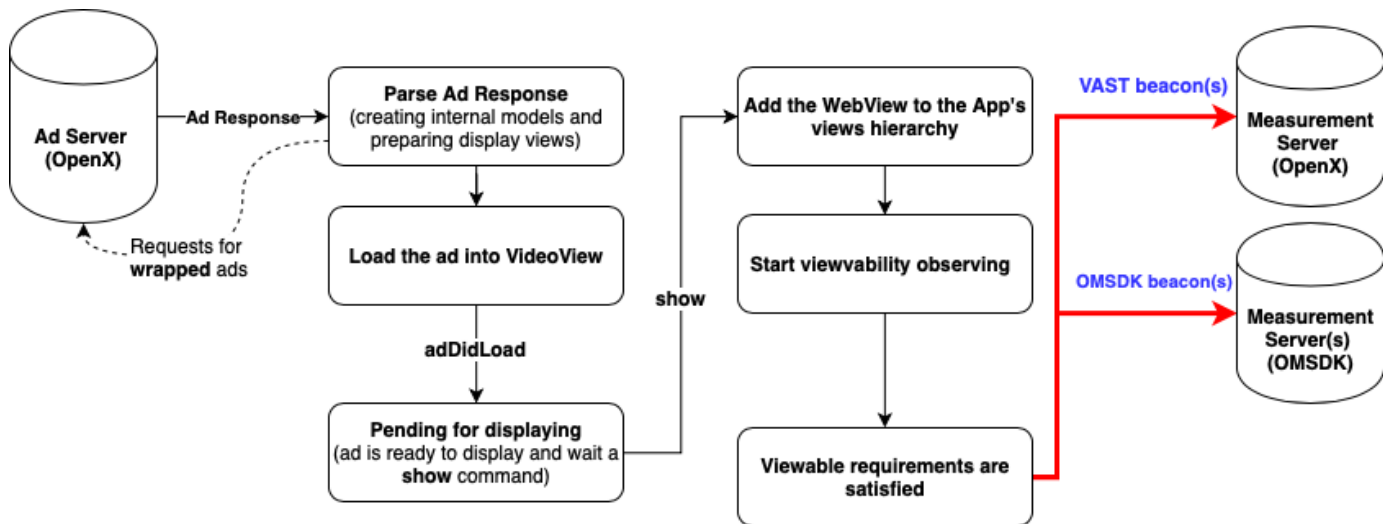
- visible area - **1 displayed pixel**
- visible time - **0 seconds**
- viewability polling frequency - **200ms**.

In this case, the impression tracking flow will be more complex. When the ad view is added to the view hierarchy, the SDK starts polling the viewability status of this view. If the viewability indicators satisfy the requirements SDK will track the impression.

Display

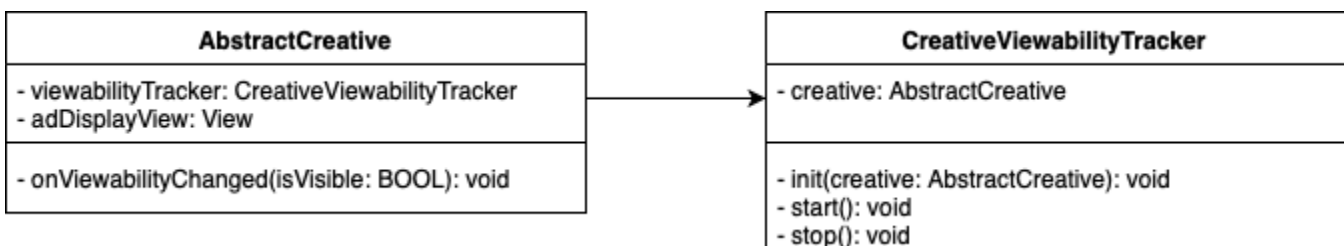


VAST

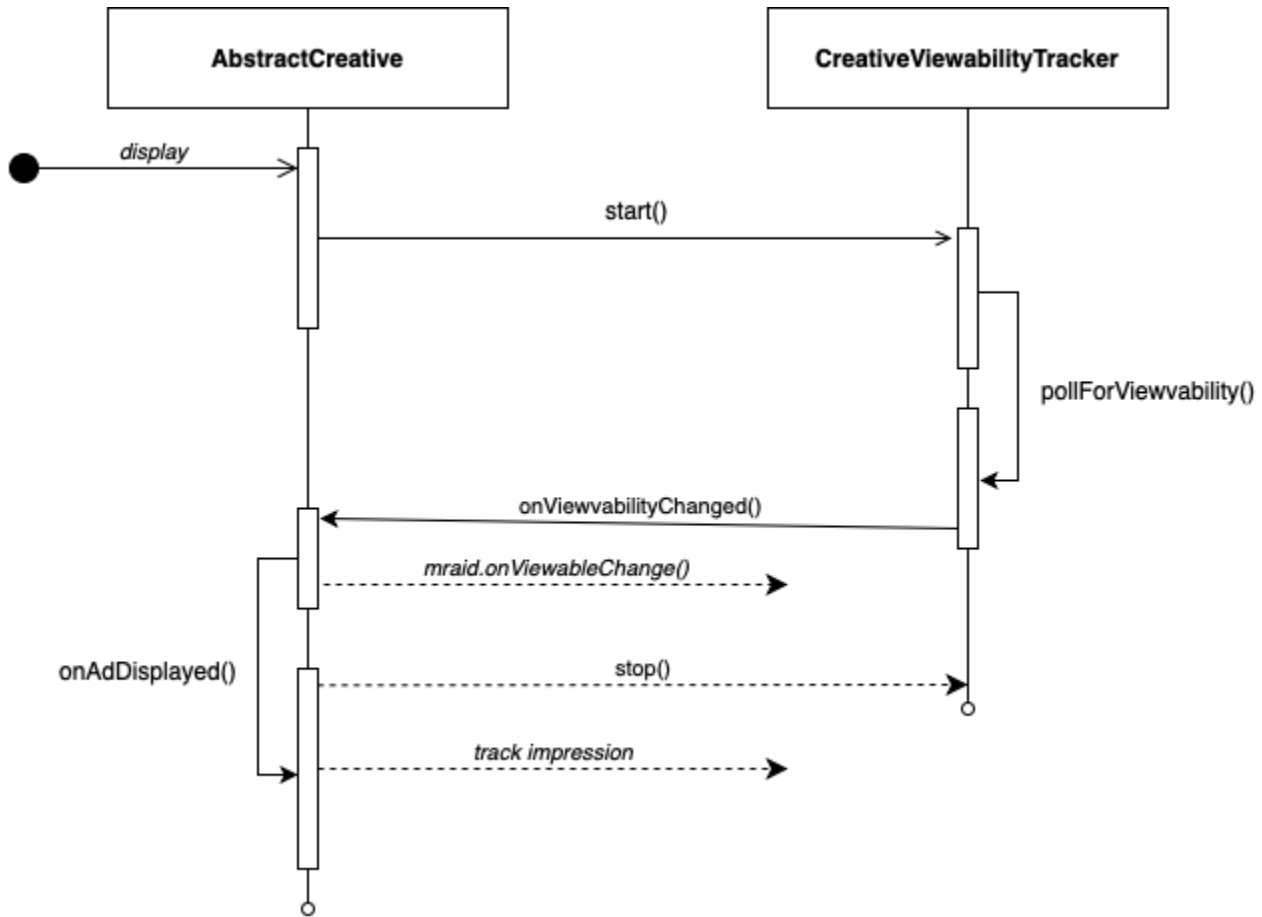


The sketch of Implementation Details

The CreativeViewabilityTracker is introduced to track the viewability state of the creative view. The task of this class is to measure the viewability properties and report the Creative about changes. Creative should act accordingly to its nature receiving events about viewability changes.



The responsibility of CreativeViewabilityTracker is pretty straightforward: to inform the Creative about changing the viewability of **adDisplayView** according to properties holder in **AdConfiguration**.



In response to the changed viewability, the Creative should invoke certain methods to inform the delegates about rendering (**creativeDidDisplay**) and track an impression (including OM SDK impression). After that, depending on the Creative type, the behavior will be different:

- **Display Creative:** pass the status to MRAID, continue tracking since it could have an impact on the MRAID ad.
- **Video Creative:** stop viewability polling, destroy ViewabilityTracker.