Google Active View
Description of Methodology

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This document is a summary of the methodology and practices surrounding Google's Active View technology.

The scope of this audit, and therefore of this Description of Methodology (**DOM**), is the basic process by which viewability is measured for **display (including mobile web), video, and mobile app ads** trafficked by Google Marketing Platform (including Campaign Manager and Display and Video 360), Google Ad Manager, Google Ads Video, and for both advertisers and publishers. This process involves Google tags in web pages, Google Mobile Ads (**GMA**) SDK, Interactive Media Ads (**IMA**) SDK, YouTube, and VPAID wrapper solution used in above products, the way information is tested and bugs are fixed, and the way Active View reports are logged and aggregated.

Please note that within the scope of the DOM we describe how Active View performs measurement on the three required buckets (i.e. Viewable impressions, Non-Viewable impressions and Non-Measurable impression). The remaining required metrics are to be represented by the respective platform and are computed off of the three buckets. For example, the viewable metrics available to users within the Campaign Manager platform will be noted within the Campaign Manager DOM, since Active View does not have their own reporting platform.

Measurement Methodology

Advertisers have long looked for insight into whether consumers saw an ad or switched the channel during a TV commercial measure "viewed" impression break. There is a similar scenario in online advertising, so Google has introduced Active View as part of the Brand Activate Initiative to measure viewable impressions, as defined by IAB and MRC:
- Display ads: a minimum 50% of ad pixels in view for a minimum of 1 second
- Video in-stream ads: a minimum 50% in view for a minimum of 2 seconds of continuous ad playback

Viewability measurements help determine whether an ad was actually shown within the browser viewpoint for X amount of time (1 second for display and 2 seconds for video). Two important factors are (a) what portion of an ad appears in a viewable space on screen and (b) how long that portion of the ad remains visible. Active View reports look at these factors, as well as other data about the viewability (or measurability) of ads for each site, placement, and domain used in ad campaigns. Active View utilizes image beacons as a tracking asset for sending viewability information collected by Active View back to Google servers.

Active View Core Technologies

The Active View measurement methodology is purely based on the recorded viewability of measured impressions (subject to filtration procedures, see below), and is not based on sampling, extrapolations or any heuristics or estimates.

The Active View measurement code is built into the Google Ad Tags and SDKs, so customers

(publishers and advertisers) of Active View don't need to do anything and Google controls the measurement process end to end.

To detect whether an ad is viewable, Active View uses client side measurement code to determine ad visibility and return the information to Google's servers.

Display Ads

For display ads, when an ad loads via the Google Ad Tags or Mobile Ads SDK, the Active View measurement code executes logic to determine whether it can measure the viewability. On modern browsers Active View uses the Intersection Observer Web API, while on older browsers it falls back to using Element.getClientBoundingRect and Window.getComputedStyle. If it can't perform measurement, a pingback is sent back to Google servers to indicate this is an unmeasurable impression, and no further monitoring is performed. If the Active View code determines that the ad is measurable, then it starts monitoring and collects information about the position of the ad on the user's browser viewport or mobile app, as well as browser events that might cause visibility change, e.g. scroll, resize, tab switch events, etc. As soon as the viewable impression criteria by IAB is met, a pingback is sent back to Google servers to indicate this is a viewable impression. If an impression becomes viewable for a second time (e.g. after tabbing back or scrolling back to the creative), Active View does not count a second viewable event.

There is a cache busting id generated for each ad request in Google Ad Tags. Active View measurement events include this cache busting id when it's sent back to Google servers. In addition, Google servers respond with "no-cache" to the Active View measurement event to ensure that the browsers do not cache it.

All the measurement events are sent back to Google servers via HTTPS requests and are routed to logs of the respective products. These logs have standard Google log access controls in place, and these logs are read only. Google has stable and highly monitored jobs to copy these logs, parse each record, and join each measurement with its corresponding ad request.

Google Mobile Ads SDK for mobile app ads

For display ads served by Google Mobile Ads (GMA) SDK, the Active View measurement code can measure 100% of the ad impressions. Active View monitors and collects information about the position of the ad on the user's mobile app, as well as any mobile app events that might cause visibility change. As soon as viewable impression criteria by IAB is met, a pingback is sent back to Active View log to indicate this is an viewable impression.

Interactive Media Ads (IMA) SDKs and YouTube

Active View supports linear and nonlinear video ad measurement in Google's Interactive Media Ads (IMA) SDKs for HTML5, Android, and iOS. YouTube players on desktop and mobile app (iOS and Android) also have Active View support built in and work the same way as IMA SDK.

For video instream ads, Active View code is built into IMA and YouTube SDKs. Active View detects the video ad player position and the browser/app viewport information.   It monitors the ad for the duration of video ad length, along with browser events (same events as for display ads above) and video playback events that might cause visibility change, i.e. pause, resume, fullscreen, skip, etc. As soon as viewable impression criteria by MRC is met, a pingback is sent back to Active View log to indicate this is an viewable impression.

The IMA SDK and YouTube web player do not support offline playback of instream video ads. The YouTube mobile clients do support offline ad playback, but offline ads are not eligible for Active View measurement.

Please note that Active View does not separate autoplay viewable counts from click-to-play viewable counts for viewability reporting purposes on video.

OMID and OM SDK

Active View supports video and display ad measurement in applications that implement the OMID (Open Measurement Interface Definition) standard from IAB Tech Lab, including those that use OM SDK (Open Measurement SDK). Active View uses OMID signals to detect the position of the ad on the user's screen and application lifecycle events that can affect visibility. For video ads, Active View uses OMID signals to detect video playback events that affect visibility, including pause, resume, fullscreen, skip, etc. As soon as Active View code determines that the viewable impression criteria by MRC is met, it sends a pingback to Active View logs to indicate it is a viewable impression.

The reporting systems for Active View take the certification of the OMID source when aggregating metrics. Only measurements from apps and ad SDKs that have undergone certification by IAB Tech Lab will appear in MRC-accredited reports.

Occlusion Detection

In all environments (desktop web, mobile web, and mobile app), Active View fully detects occlusions caused by content in the background and content clipped or scrolled in the user interface which is partially or completely unable to be seen by a user. Active View is able to detect some cases of occlusions caused by Z-order layering (or vertical stacking) of elements or OS-level alerts, notifications and controls.

See-Through Capabilities

When Active View code executes in a cross domain iframe, it uses two methods to attempt to measure viewability. On modern browsers Active View uses the Intersection Observer API (just as in the same-domain case). On Internet Explorer it uses a pixel-based technique to determine the visible region of the iframe. Otherwise it reports the ad as unmeasurable.

Measuring Rich Media Expandable Ads

For Rich Media Expandable Ads, Active View determines the viewability state based on the original unexpanded ad size while the ad is unexpanded. Active View continues measurement by looking at the expanded ad size definition if the ad happens to expand before the ad meets the one second criteria. This happens very rarely.

Special Handling for Large Size Ads

MRC Viewable Ad Impression Measurement Guidelines mandate the use of the large size ad pixel threshold (30% instead of 50%) to determine viewability for certain large size display ads (i.e., those greater than 242,500 pixels in size) on desktop. Active View has made the transition to support the large size ad pixel threshold for all large size ads on all desktop platforms.

Active View Log Processing

Active View pingbacks contain the viewability measurement data sent from the measurement client (JavaScript or native SDK). The raw records are parsed and joined with the original ad queries and stored in joined Active View logs.

Data Retention

The raw viewability data is maintained for 12 weeks for reprocessing should a system issue be identified or some other need arises.

Active View Reporting

Active View metrics are currently reported through AdSense Front End (ASFE), Google Ads Front End (formerly AdWords Front End), DFP Front End, Adx Front End, and Google Marketing Platform Front End for both display and video ads.

Invalid traffic (IVT) impressions are discounted before reporting any impression counts for Active View. This includes impressions counted in reports on total impressions, viewable impressions, and measurable impressions. Please note that Google employs techniques based on identifiers, activity and patterns based on data in the log files in an attempt to identify and filter (exclude) invalid activity, including but not limited to known and suspected non-human activity and suspected invalid human activity. Google ad server log files are marked for invalid events and non-human traffic by AdSpam team. It's through joining with these logs that we ensure Active View reports only include clean traffic. The filtration step includes (but is not limited to) the following.

Google utilizes both general and sophisticated invalid traffic techniques (GIVT, and SIVT, respectively). Google's intention is to comply with both GIVT and SIVT guidelines for all accredited products.

Non-human traffic

Non-human traffic including robots, spiders, crawlers and agents (collectively referred to as robots) represents programmatic activity on the website. This activity is comprised of programs making requests for web pages on the website and recursively following the links on the page to other pages within the website, including in many cases, the links to the ad servers. This activity may include system monitoring tools designed to ensure the website is functioning properly and content indexing or retrieving processes such as those used by search engines to populate their databases.

When a user's browser or robot makes a request of a server for content, it typically provides certain data to the web server in addition to the specific request, including their IP Address and User Agent. The User Agent typically provides certain information to the web server such as browser type (Internet Explorer, Firefox, Safari, Netscape, Opera, etc.), browser version, the computer's operating system, etc. and may also include information identifying itself to the web server.

Google performs the following procedures to identify robotic traffic.

Specific identification

Within Google Ad Manager, Google Marketing Platform, and Google Ads, Google utilizes a single-pass specific identification approach for filtration of robot activity. User agents are compared to a list of known robot user agent strings (e.g., the user agent strings in the IAB Industry Robot List) and flagged within the ad server log file as robotic activity. Any log entries that include a known robot user agent string are filtered from reported ad impressions during processing on the backend servers and joined with active view logs. Google monitors the discrepancies between Google's single-pass filtration approach and the IAB Guidelines recommended dual-pass filtration approach through a monthly analysis conducted on a sample of ad servers for seven consecutive days.

Google obtains the IAB Industry Robot and Valid Browser Lists (valid browser list is only for Google's internal analysis) on a monthly basis using an automated system and identifies any changes since the prior report. The system also identifies the differences between the IAB Industry Robot List and current Exclusion List. In situations where changes are identified, adjustments to update the Exclusion List are performed.

Additionally, Google utilizes Robot Instruction files (robots.txt) within the root directory of the Google domains disallowing all robotic activity.

Internal traffic

Google's internal visitors might skew the measured statistics. MRC minimum standard A.11(affiliated traffic) and the IAB Guidelines require that human traffic originating from the company network should be filtered and reported separately from external visitors.

Google internal traffic, based on a listing of all Google internal addresses, is excluded from Active View reports in all products.

Behavior Analysis

GDN also uses a sophisticated mechanism for marking queries as spam based on behavior analysis. Any queries marked as "filtered" by this process are also purged from Active View reports.

To summarize the filtration methodologies: For GDN, Google removes any stats belonging to queries marked as spam by Google's ad spam technology, including but not limited to queries coming from known (IAB and more) spam IPs and user agents, wrong IPs, duplicate queries, roboted queries, internal and debugging queries, queries from spam and policy blacklisted publishers and activity based spam. Also, if a measurement can not be tied to proper non-duplicated, non-robotic, non-spam impressions, they are discarded from our reports. On DCM/DBM side, Google removes any stats belonging to queries from IAB's published list of blacklisted user agents. In both GDN and DCM/DBM, if measurements can not be tied to proper non-duplicated, non-roboted impressions, they are discarded from Google reports.

Please note that DCM platforms now consumes viewable impressions from Active View as a part of spam process for DCM pipeline.

Disclaimer: During the data processing procedures, certain log entries are removed from the logs as they represent situations where the log entry indicates a situation other than usable log entry, such as, the Google servers did not process the request, and therefore, assigned an error code status to the request; incomplete or corrupted log entries, as the Active View process and corresponding ad trafficking processes require certain fields to be found, complete and accurate for processing.

What causes unviewable impressions?

There is a range of reasons why impressions can be counted as unviewable. Here are some of the major reasons for unviewable impressions:

1) Ads that don't meet the area coverage criteria (that is 50% of ad pixels in view for regular ads and 30% of ad pixels in view for large size ads):

a. Many ads are served below the fold and as a result, if the user doesn't scroll all the way to the bottom of the page, the ad won't meet the viewability criteria
b. If the user opens a new tab and quickly tabs away, the ads won't have the opportunity to be viewed
c. Users may open multiple tabs either by clicking multiple links or restoring a previous browser session. Some of the tabs may be closed before the user views them. When this happens, all ads on the tab will be unviewable.

2) Ads that don't meet the time criteria (that is 1 second for display ads and 2 seconds for video instream ads)

3) Ads on sites not optimized for mobile devices

- When a tablet or phone user visits a site that's not optimized for mobile devices, they may quickly zoom the page to view the content
- The zoom may push ads beyond the boundaries of the viewport and these will not be viewable.

Limitations by platform

Google Marketing Platform (formerly DCM and DBM)

- Display
  - Web pages with DART ADI and ADJ tags are supported. See-through methodologies are applied for improved measurability.
  - Mobile apps using GMA SDK generally support measurement of ADJ (but not ADI) tags.
  - 1x1 tracking pixel traffic is not supported.
- Video
  - Web pages using HTML5 IMA SDK are fully supported. However, if the IMA player is in a cross domain iframe, and none of the see-through methodologies work, then the traffic will be considered unmeasurable. The traffic is also unmeasurable if the query has "allowscriptaccess" parameter set to false by the publisher.
  - Mobile apps using IMA and GMA SDKs are generally supported.
  - For web pages using other SDKs or players, Google uses a "VPAID wrapper" solution. If the publisher does not allow VPAID, then the impression will be considered non-measurable. VPAID in HTML5 is fully supported; VPAID in mobile app is not supported.

Google Ads (formerly AdWords Video)

- Video
  - GDN video served through IMA SDK is supported. On top of this, Google's policies in GDN require publishers not to set "allowscriptaccess" parameter to false. As a result, Active View can measure all this traffic with IMA SDK version

3.0 or above. See-through methodologies are applied for improved measurability.
- ○ Mobile app video using IMA and GMA SDKs are generally supported.

Google Ad Manager (formerly DFP)
- ● Display:
  - ○ Web pages using GPT tags and legacy GAM tags are supported. Active View measures the ad container area provided by the publisher. See-through methodologies are applied for improved measurability.
  - ○ Mobile apps using GMA SDK are supported.
  - ○ Active View does not support custom implementations that bypass Google tags (e.g., a publisher writes their own JavaScript to make a GPT-like request).
  - ○ Legacy DART ADI tag is not supported.
- ● Video
  - ○ Web video coming through HTML5 IMA SDK that have not set "allowscriptaccess" parameter to false can be measured.
  - ○ Mobile app video using IMA and GMA SDKs are generally supported.
  - ○ Active View does not support websites or apps that bypass Google tags or SDKs.
  - ○ See-through methodologies are applied for improved measurability.

GMA SDK
- ● Display
  - ○ Active View measures the visibility of the ad container (webview) for HTML-format ads.
- ● Video
  - ○ Active View measures the visibility of the video player. When the video creative and player have different aspect ratio, the creative cannot fully expand to fill the player, and so the player adds bars to center the creative in the player.

YouTube
- ● Video
  - ○ Measurement of instream video on the YouTube website and mobile apps is fully supported.
  - ○ Active View measures the visibility of the video player. The format "Vertical Video Ads" is designed to crop the creative within the container. It is possible for the player to meet the viewability threshold when the video creative has less than 50% of its pixels on screen. As a result, advertisers who primarily use this format may have meaningfully increased viewability.
- ● Display
  - ○ Most display ads on YouTube website and mobile apps are not supported.
- ● Continuous Play - Video content may be played in a play-list environment where a series

of videos may be automatically played without user interaction.

Browsers

- Chrome
  - In general, Chrome is supported on all platforms.
  - Chrome versions 51 and newer support Intersection Observer for cross-domain measurement. Active View does not have a cross-domain solution for older versions of Chrome.
- Edge and IE
  - In general, Edge is fully supported on all platforms.
  - Edge versions 15 and newer support Intersection Observer for cross-domain measurement. Active View uses a pixel measurement technique on IE 11. Active View does not have a cross-domain solution on older versions of Edge and IE.
- Firefox
  - In general, Firefox is fully supported on all platforms.
  - Firefox versions 55 and newer support Intersection Observer for cross-domain measurement. Active View does not have a cross-domain solution for older versions of Firefox.
  - If the user has disabled image loading, pingbacks are not sent to Google and the ads are considered unmeasurable.
- Safari
  - In general, Safari is fully supported on all platforms.
  - Safari versions 12.1 and newer support Intersection Observer for cross-domain measurement. Active View does not have a cross-domain solution for older versions of Safari.

Summary of See-Through Rates

The figures below represent display traffic.

Reporting platform	Environment	Measurable %
Google Marketing Platform (formerly DCM/DBM)	Desktop	92%
	Mobile Web	70%
Google Ad Manager (formerly DFP)	Desktop	89%
	Mobile Web	70%
Google Ads (formerly AdWords Video)	Desktop	N/A
	Mobile Web	N/A

Appendix

1) Active View does not utilize proxies such as strong user interaction when determining viewable impressions.
2) Active View polls parameters needed for computing viewability every 100ms for display on web pages, 200ms for display ads in GMA SDK, and 200ms for video ads
3) IAB Measurement Guidelines require the usage of cache controls in order to minimize the potential of caching. This can be achieved through the usage of Expiry, Cache-Control, or Pragma HTTP headers. Active View uses Pragma: no-cache, Cache-Control: no-cache, must-revalidate, and Expires: 0.
4) Active View measures the latency associated with running Active View measurements through performing "live" experiments. These experiments are running continuously to make sure that there is no loss of queries or other performance metrics as a result of running Active View on the publisher's page.
5) Active View does not currently identify or quantify auto-refresh generated traffic and hence does not differentiate significant Auto-Refresh versus Human-Initiated activity in the reports.
6) All stages of the pipeline are monitored, and there are automatic alerts set at each step. The alerts notify Active View on-call engineering team members to look into any existing issues in the system and put in the corresponding fix. Also, the end to end measurement pipeline has standard Google alert mechanisms set up which will notify Google Ads on-call engineers.
7) Active View viewability measurement is JavaScript dependent in all environments (desktop, mobile web, mobile in-app) except for YouTube in-app.
8) Active View viewability measurement does not use Flash.