Interactive Advertising Bureau Technology Laboratory
Mobile Marketing Association
Media Rating Council

Mobile Web Advertising Measurement Guidelines

Adapted from IAB (US) Impression Measurement Guidelines

Version 4.0
MMTF Final Version 1.1
October 2017

Background

These guidelines have been developed through the joint efforts of the Interactive Advertising Bureau (IAB), Interactive Advertising Bureau Technology Laboratory (IAB Tech Lab), the Mobile Marketing Association (MMA) and the Media Rating Council (MRC). Version 1.0 was completed with guidance from members from all four organizations.

Modernizing Measurement Task Force

The IAB formed the MMTF (Modernizing Measurement Task Force) in 2015 to serve as an advisory body that is responsible for recommending prioritization and modernization of the MRC digital measurement guidelines. This group focuses on updating and maintaining guidelines that are led by the MRC with facilitation by the IAB Tech Lab and pertains to measurement guidelines that require third party and industry oversight such as this one.

All recommended updates will be presented to and reviewed by the MMTF as well as approved by the MRC in coordination with the MMA.

MMTF Participants

Ad-iD	FOX Networks Group	OwnerIQ
Adform	FOX News Channel	Pandora
AdGear Technologies, Inc.	FreeWheel	Parsec Media
ADLOOX	Genesis Media	PGA TOUR
Admiral Adblock Publisher Solutions	Google	Pinterest
Adsiduous Media	Greentarget	Pixalate
ADVR	GroupM	Positive Mobile
Alliance for Audited Media (AAM)	Hanley Wood	PR Council
Annalect	Haymarket Media	PricewaterhouseCoopers
AppNexus	Hearst Magazines Digital Media	Publicis Media
Bank of America	Horizon Media	PubMatic
Bidtellect	Hotwire	Quantcast
BlogTalkRadio	Hulu	Reuters
BPA Worldwide	IAB Tech Lab	RhythmOne
Brightcove	IAB Canada	S4M
BrightRoll	Integral Ad Science	Snap, Inc.
Burson-Marsteller	IPONWEB Inc	StartApp
Burt	Jun Group	Tech Mpire
BuzzFeed	Leaf Group	TEGNA, Inc.
Cars.com	LifeScript	Teradata
CBS Interactive	Lithium | Klout	Terra Networks USA
Celtra	Lonely Planet	The Daily News
Complex Media	Magna Global	The Weather Company
comScore	Management Science Associates	Throtle
Conversant Media	Mansueto Ventures	Time Inc.
Current	Markit Digital	Tremor Video
Demand Media	Mashable	TripAdvisor
Denstu Aegis	Mbooth	Txt Signal
deviantART	MBWW	Univision
Digital First Media	Media Rating Council	Unruly

Disney Interactive	Medialets	V12 Group
Dominion Digital Media	Mediavest Spark	Verve
DoubleVerify	Merkle	Viacom
Edmunds.com	Merriam-Webster / Britannica	ViralGains
Emogi	Moat	Visible Measures
Enthusiast Network	Mobile Marketing Association (MMA)	Washington Post Digital
Ernst & Young	Moxie	Weber Shandwick
ESPN.com	National Public Media	WebMD
Extreme Reach	Nativo	Webspectator
eyeReturn Marketing	NBCUniversal	White Ops
Eyeview	Nielsen	Woven Digital
Flashtalking	NPR	xAD
Fleishman Hillard	NYIAX, Inc.	Yieldmo
Flite	Ooyala	Zenith Media
Foursquare	OpenX	
Jumpstart Automotive Media	Opera	

Contact Information

For questions related to the content of this guideline, please contact:

Brendan Riordan-Butterworth
Senior Director, Technical Standards
IAB Tech Lab
(212) 609-3734
brendan@iabtechlab.com

MMA:
Leo Scullin, VP of Industry Programs
917-439-5059
leo@mmaglobal.com

MRC:
Ron Pinelli, Vice President Digital Research and Standards
212-972-0300
rpinelli@mediaratingcouncil.org

Table of Contents

Scope and Applicability

1.0 Measurement Definitions
- **1.1 Ad Impressions**
- **1.2 Impression Measurement Approaches**
- **1.3 Tracking Assets**
- **1.4 Tracked Ads**
- **1.5 User Ad Requests**
- **1.6 Ad Delivery**
- **1.7 Mobile Device**

2.0 Ad Measurement Guidelines
- **2.1 Impression Tracking**
- **2.2 Auto-Refresh**

3.0 Enhancing Impression Tracking Accuracy
- **3.1 Cache Busting**
- **3.2 Filtration**
  - 3.2.1 Proxy Servers
  - 3.2.2 Pre-fetch / Pre-render Activity
- **3.3 Rich Media Ad Impressions**

4.0 Click Measurement Considerations
- **4.1 Click Measurement**

5.0 General Reporting Guidelines
- **5.1 Time**
- **5.2 Location**

6.0 Disclosure Guidance

7.0 Auditing Guidelines
- **7.1 General**
- **7.2 U.S. Certification Recommendation**

8.0 Who We Are

9.0 References

10.0 Glossary of Terms

APPENDIX A Examples of Server-Side and Client-Initiated Counting

APPENDIX B MRC Digital Advertising Measurement Technical and Transparency Best Practices

Scope and Applicability

The Mobile Web Advertising Measurement Guidelines have been developed by the membership of the Interactive Advertising Bureau (IAB), Interactive Advertising Bureau Technology Laboratory (IAB Tech Lab) Mobile Marketing Association (MMA), the IAB (U.S.), and Media Rating Council (MRC) in close collaboration with the GSMA and other stakeholders. Contributors to these guidelines are representative of the key parties in the mobile marketing ecosystem, and include handset manufacturers, wireless operators, ad servers, content providers, agencies, brands and technology enablers.

While these guidelines follow the general parameters and principles of the Advertising Measurement Impression Guidelines previously issued by IAB (U.S.) for online advertising measurement, and are similar to them in many respects, this document has been authored with a specific focus on the unique attributes of Mobile Web advertising. Thus, while many portions of this document will be similar to the existing IAB Guidelines for online measurement, specific guidance in certain other areas will differ (yet will follow the same general principles) because of this consideration of the applicability to the mobile web environment.

Applicability of these guidelines, as opposed to the original IAB Advertising Measurement Guidelines, generally should be based on the type of ad served. For instance, ads served from a mobile version of a web site, or versions of ads specifically served to a mobile device or in a mobile web environment, should apply these Mobile Web Measurement Guidelines for counting purposes.

This set of guidelines is intended to cover measurement of WAP/Mobile Web advertising activity. Measurement of other forms of mobile advertising activity, including messaging applications (SMS and MMS), mobile applications, and various forms of mobile audio and video (including streamed, downloaded, broadcast and progressive audio and/or video), is not within the scope of these guidelines.

For purposes of this document, mobile web refers to website content and ads within it, displayed within a mobile web browser or displayed by an embedded browser within an application environment (excluding interstitials). Mobile In-Application (In-App; outside the scope of these guidelines) refers to content and ads within the native User Interface of an application and not content within either a mobile browser or an embedded browser within an application environment (an instance that is embedded within a native application; typically, this occurs when a user clicks on a URL in a mobile application and the application executes the embedded browser).

This document is principally applicable to mobile marketers, wireless operators, mobile publishers, ad serving organizations as well as measurement vendors, and is intended as a guide to accepted practice. Additionally, planners and buyers of mobile media advertising can use this document to assist in determining the quality of measurements.

1.0 Measurement Definitions

Advertisements rendered on mobile devices are currently measured in various ways depending on the marketing channel used and its associated measurement capabilities.

1.1 Ad Impressions

An Ad Impression across all mobile marketing channels is the 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.

1.2 Impression Measurement Approaches

Two methods are currently used to deliver ad content to the user – server-initiated and client-initiated. Server- initiated ad counting uses the site’s web content server for making requests, formatting and re-directing content. Client-initiated ad counting relies on the user’s browser to perform these activities (in this case, the term “client” refers to a user’s browser).

Client-initiated measurement involves a recognition on the client side of the successful delivery of an Ad Impression, and this information is communicated to a counting server for reporting.

Server-initiated measurement (also known as count on decision or count on insertion) involves the recognition on the ad server side that an Impression has been delivered, but with no assurance that the ad was actually rendered on the user’s browser. Client-initiated measurement is the only acceptable method for the counting of valid ad impressions. Server-initiated ad counting methods are not accepted, however pass-through methods of signaling interactions detected on the client side from server infrastructure are acceptable.

Please refer to Appendix A of IAB’s *Desktop Display Impression Measurement Guidelines* for diagrams of examples of valid implementations of Client-initiated counting approaches. Only those examples where counting follows ad content delivery are acceptable client-initiated measurement approaches for mobile web ad impression measurement. Implementations in which counting precedes ad content delivery are not acceptable for mobile web ad impression measurement.

1.3 Tracking Assets

A tracking asset is any piece of content associated with an ad or the page on which an ad appears that is designated to serve as the “trigger” by which the ad is counted. The content that serves as a tracking asset often may be, but is not limited to, a 1x1 pixel image, a 302-redirect, a JavaScript code, or the ad itself.

1.4 Tracked Ads

The number of ads where measurement was initiated. These ads (referred to herein as Tracked Ads; alternate labeling may apply) must adhere to the requirements detailed in this document (including client-initiated counting and cache controls) except that they can be counted when a vendor’s measurement assets have fully downloaded and initiated, but prior to ad content loading and rendering. This metric should not be labeled as an Ad Impression

without qualification.

1.5 User Ad Requests

A user ad request is the result of an active or passive act on the part of the user of a mobile marketing channel. The user may explicitly call for the ad to be delivered, or a request to the ad delivery system is triggered based on other user's actions.

1.6 Ad Delivery

Please refer to Appendix A of IAB's *Desktop Display Impression Measurement Guidelines* for diagrams of examples of valid implementations of Client-initiated counting approaches. (See note in Section 2.2 concerning valid implementations).

1.7 Mobile Device

A handset, tablet, or other communication device (running a mobile operating system) used to access the Internet wirelessly, usually through a mobile carrier or Wi-Fi network. Traditional PCs and laptops are not considered mobile devices for the purposes of these guidelines nor are hybrid devices running desktop operating systems.

2.0 Ad Measurement Guidelines

Ad impressions are measured on the Client (device) Side (counting may happen at the server side as long as it is initiated based on client-side events and measurement assets). Client-initiated ad impression measurement is required because this approach to counting occurs when the client at minimum begins to render the ad request, which occurs at a later stage in the cycle. The original intent was to set impression requirements closest to actual opportunity to see by the user (see specifics below). However, since the original publication of these guidelines, the emergence of the viewable impression (as defined in the MRC Viewable Impression Measurement and MRC Mobile Viewable Impression Measurement Guidelines) as a separate metric has satisfied this intent.

Ad impression measurement remains relevant at minimum as an input into viewability metrics (such as in the Measured Rate denominator) as well as a mechanism to quantify activity measured by organizations that might not be part of the advertising chain (such as non-ad-serving third-party measurement vendors). This section provides recommendations and considerations in counting the number of advertising impressions.

2.1 Impression Tracking

The following details are key components of client-initiated measurement:

1. A valid ad impression may only be counted when an ad counter receives and responds successfully to a request for a tracking asset from a client. This count happens after the initiation of retrieval of underlying page content and only when ad content has been loaded and at minimum begins to render (see note on Tracked Ads below). For client-side ad serving, the ad content itself could be treated as the tracking asset and the ad server itself could do the ad counting as long as counting does not occur until ad content has been loaded and at minimum begins to render.

   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.

Note: There will necessarily be some slight differences among measurers in the precise moment when rendering is measured as a qualification for ad impressions. The requirements above mean that the ad content must have been loaded at the client-side and at minimum begins to render into the user interface or browser such that it can be at least partially visible (also referred to as ad injection or execution). 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). It does not require any portion of the ad to be visible or displayed on screen. While technical limitations may preclude requiring measurement only after an ad has fully rendered, vendors not measuring fully rendered impressions are encouraged to periodically study and monitor differences between render initialization and completion.

2. A successful response by the ad counter can include but is not limited to:

    a) Delivery of a “beacon,” which may be defined as any piece of content designated as a tracking asset. Beacons will commonly be in the form of a 1x1 pixel image, but this Guideline does not apply any restrictions to the actual media-type or content-type employed by a beacon response; or
    b) Delivery of a “302” redirect or HTML/ JavaScript (which doubles as a tracking asset) to any location; and
    c) Delivery of ad content

3. Measurement of any ad delivery may be accomplished by measuring the delivery of a tracking asset associated with the ad as long as counting does not occur until ad content has been loaded and at minimum begins to render.

As a recommendation, sites should ensure that every measured ad call is unique to the page. There are many valid techniques available to do this, including the generation of random strings directly by the server, or by using JavaScript statements to generate random values in beacon calls. See section 3.1 of this document entitled Cache Busting for further information.

Tracked Ads

A measurement vendor may elect to measure and report the number of ads where measurement was initiated. These ads (referred to herein as Tracked Ads; alternate labeling may apply) must adhere to the requirements above (including client-initiated counting and cache controls) except that they can be counted when a vendor’s measurement assets have fully downloaded and initiated, but prior to ad content loading and rendering, This metric should not be labeled as a Ad Impression, but will assist both buyers and sellers in addressing rendering issues (by providing a means to ascertain ads that do not render) and support the transparency needed by organizations that track ads whether they render or not such as organizations that might not be part of the advertising chain (e.g., non-ad-serving third-party measurement vendors). Such measurement and reporting is allowable under these guidelines with proper disclosure and reporting in conjunction with qualified Ad Impressions.

To foster consistency in measurement and among all the parties in the transaction stream (and similar to guidance in the IAB Click Measurement Guidelines), the development of periodic and detailed reporting using a unique identifier, a unique numeric or alphanumeric string associated with the transaction, is encouraged (although not required at this time). This unique identifier is intended to assist in investigation or auditing, and is not necessarily intended for use beyond these internal purposes. A unique identifier should be considered when measuring and reporting Tracked Ads alongside Ad Impressions as well as other metrics outside this scope of this document (such as Ad Requests and Viewable Impressions) in order to foster a one-to-one relationship between these metrics.

2.2 Auto-Refresh

Auto-Refresh refers to the action of serving or changing advertising or content in an automatic manner. Auto-Refresh can be set directly by a user (user initiated) or set by a site without user interaction (site initiated).

Website content owners generally directly control the use of site initiated Auto-Refresh. External parties have significantly less ability to detect, measure and report on Auto-Refresh accurately, especially when using ad centric measurement approaches. As such, content owners or media seller organizations are encouraged to disclose the use of site initiated Auto-Refresh including parameters, settings and relative volumes or otherwise make this information available for use by measurement organizations (such as by being passed as part of data transmissions) consistent with the MRC Digital Advertising Measurement Technical and Transparency Best Practices (Appendix B).

Measurement organizations are required to collect and utilize site initiated Auto-Refresh information disclosed or passed by content owners or media seller organizations. Measurement organizations are encouraged to develop techniques to detect and estimate site initiated Auto-Refresh if not otherwise disclosed or passed.

To the extent known by measurement organizations, the presence of site initiated Auto-Refresh should be disclosed to users of measurement data including the parameters and settings surrounding Auto-Refresh. Further, site initiated Auto-Refresh should utilize reasonable rates for the associated content type (sports site, news site, stock tickers, etc.) and include segregated disclosure of the Auto-Refresh counts if they are material to total impressions by campaign. User initiated Auto-Refresh is counted as a normal advertising impression.

See the *IAB Digital Video Measurement Guidelines* for further discussion of measurement and reporting issues related to Auto-Refresh.

3.0 Enhancing Impression Tracking Accuracy

Those advertisements that are delivered to mobile users without an accompanying request for the ad (such as with pushed content) should not be counted as ad impressions unless there is evidence that the ad at minimum begins to render on the device. This principle should also apply to idle screen ads, offline ads, and cached ads.

The following techniques are recommended in order to ensure accuracy in impression measurement:

3.1 Cache Busting

In some cases an ad can be rendered from a device's cache, and there is a risk that the client or server will not record the Ad Impression. Advertising instances should be counted across all ad request activity, regardless of whether the advertising or application functionality has been stored in cache. Accordingly, if cache techniques can impact Ad Impression counting, cache-busting techniques should be employed and are required for all sites and ad serving organizations. The following techniques are required:

1. HTTP or WAP Header Controls
   The ad counter should employ standard headers on the response, in order to minimize the potential of caching a time-sensitive advertisement. These standard headers must include:
   - Expiry
   - Cache-Control

2. Unique String assignment techniques (such as random number or date/timestamp append with sufficient granularity) to identify unique serving occurrences of pages/ ads.

Publishers and ad serving organizations should fully disclose their cache busting techniques to buyers and other users of their data.

3.2 Filtration

Filtration of site or ad-serving transactions to remove invalid traffic is highly critical for accurate, consistent counting. All metrics subject to audit by MRC will be expected to comply with the MRC's Invalid Traffic and Filtration Guidelines Addendum. This includes impression metrics, which should be filtered for known General Invalid Traffic as required by those guidelines. Furthermore, application of Sophisticated Invalid Traffic detection processes is strongly encouraged for monetized traffic.

3.2.1 Proxy Servers

The use of proxy servers is particularly prominent in mobile web, which also adds to the complexity of measurement in the mobile web environment. The employment of effective cache busting techniques is crucial to ensure that ad impressions are not undercounted because of ads served from a proxy server's cache in response to a user request.

3.2.2 Pre-fetch / Pre-render Activity

Pre-fetch refers to a request for and caching of Internet content by an application that occurs prior to, but in anticipation of, the request for the content by a user. Pre-rendering is a similar, but more aggressive technique, where actual page elements and even complete pages may be loaded in a browser prior to a user navigating to a page. Such requests (Pre-fetch and Pre-render) are generally made for the purpose of speeding content access (due to the in advance caching process) if and when the content is actually requested by the user.

As discussed throughout this document, a valid impression count must happen after the initiation of retrieval of underlying page content and only when ad content has been loaded and at minimum begins to render. As such, Pre-fetch and Pre-render

requests do not qualify for measurement as a valid impression unless ad content has been loaded and at minimum begins to render in response to a request by a user.

Tracked Ads should still account for and exclude Pre-render situations to account for situations where a user did not navigate to a page.

Content owners or media seller organizations are encouraged to disclose the use of Pre-fetch and Pre-render requests (such as via self-announcing) consistent with the MRC Digital Advertising Measurement Technical and Transparency Best Practices (Appendix B). Measurement organization are encouraged to implement counting methodologies in such a way as to not subject the measurement events to being Pre-fetched or Pre-rendered to reduce or eliminate reliance on self-announcing.

3.3 Rich Media Ad Impressions

See the Desktop Display Impression Measurement Guidelines for guidance on the measurement of Rich Media impressions, which should be consistently applied for measurement in mobile web environments.

With certain technologies, such as Ajax for mobile and similar executions, changes to page content and the serving of advertisements are not always clearly linked. Therefore, other methods are needed to trigger the counting of ad impressions. As the use of such technologies in mobile implementations becomes more prevalent, additional specific guidance for its measurement may be required. Until then, the user activity requirements associated with Ajax for mobile or similar executions in these definitions should be patterned after the IAB's Rich Internet Application Guidelines. For further information on user activity requirements in Ajax applications, see Section 2 of the IAB's Rich Internet Application Guidelines.

4.0 Click Measurement Considerations

4.1 Click Measurement

Ad impressions related to Click Measurement are those ads that include clickable content; that is, content on which the user may click to obtain additional content or to initiate a transaction or other activity. Comprehensive mobile click guidelines are beyond the scope of this document. Those interested in measuring mobile clicks are advised to follow the same general principles as are spelled out in the IAB Click Measurement Guidelines until such time as new guidelines for clicks that are specific to the mobile web environment are developed (periodic updates of the Click Measurement Guidelines now include consideration of mobile environments).

Below is general guidance for the counting of clicks that may be applied to mobile web.

- In the event that a click transaction may be initiated by user activity that is in proximity to the clickable ad, but not specifically on the ad, the specific parameters used (i.e., the measurement of the boundaries surrounding the ad that can result in a completed click) should be disclosed.
- Definitions specific to click measurement include:
    - "Click" (or "Click Through"), referring to a user-initiated action on an advertisement or search result that results in transferring the user from a

publisher site to an advertiser site.
- "In-Unit Clicks," which, similar to the above, involve a user initiated action on an advertisement but does not result in a transfer from the publisher site.

At present, there are differing methods used for the counting of clicks. Regardless of the method used, these methods should be fully disclosed. In addition, the development and use of unique click identifiers is encouraged. Also, processes should be established to filter and exclude invalid clicks from click measurement counts.

5.0 General Reporting Guidelines

General reporting parameters (dayparts, weekparts, time zones, etc.) provide for consistency and comparability. These should be based on the logical application of information about the usage patterns of the medium.

In order to provide for more standardization in mobile web Measurement reporting, the following general reporting parameters are recommended (although not explicitly required). Note that these are only several of the possible reporting parameters that may be used. If parameters in addition to these are reported, similar rules should be defined and applied.

5.1 Time

Day — 12:00 midnight to 12:00 midnight

Time Zone – Full disclosure of the time-zone used to produce the measurement report is required. It is preferable, although not a current compliance requirement, for certified publishers or ad servers to have the ability to produce audience reports in a consistent time-zone so buyers can assess activity across measurement organizations. For US-based reports it is recommended that reports be available on the basis of the Eastern time- zone, for non US-based reports this is recommended to be GMT.

Week — Monday through Sunday Weekparts — M-F, M-Sun, Sat, Sun, Sat-Sun

Month – Three reporting methods: (1) TV Broadcast month definition. In this definition, the Month begins on the Monday of the week containing the first full weekend of the month, (2) 4-week periods – (13 per year) consistent with media planning for other media, or (3) a calendar month. For financial reporting purposes, a month is defined as a calendar month.

Additional Recommendation: Dayparts – Mobile usage patterns need further analysis to determine the usefulness of establishing effective and logical standardized reporting day parts. We encourage such analysis to determine the need for standardization of this measurement parameter.

5.2 Location

If information about the geographic location of the users is collected and reported, any limitations to the methods used should be disclosed. Location measurement and disclosure should be consistent with MRC location-based advertising guidance when finalized and where applicable.

For reporting purposes, measurements for a campaign should be segregated by the various types of

ads included in the campaign. For instance, counts should be reported separately for ads within the campaign of different sizes or functionalities. Reporting should be segregated by placement. Mobile Web measurement should be segregated and distinct from Mobile Application and desktop measurement.

6.0 Disclosure Guidance

Media companies and ad serving organizations should disclose their ad impression recording process to buyers and other users of the ad impression count data via a description of methodology and other supplemental materials. An organization's methodology for accumulating mobile advertising measurements should be described to users of the data. Specifically, the nature of measurements, methods of sampling used (if applicable), data collection methods employed, data editing procedures or other types of data adjustment or projection, calculation explanations, reporting standards (if applicable), reliability of results (if applicable) and limitations of the data should be included in the disclosure.

The following presents examples of the types of information disclosed.

Nature of Mobile Advertising Measurements

- Name of Property, Domain, Site, Application (if applicable) Included in the Measurement
- Name of Measurement Report
- Type of Measurements Reported
    - Time Periods Included
    - Days Included
    - Basis for Measurement (including basis for determining ad rendering where applicable)
    - Geographic Areas
    - Significant Sub-Groupings of Data
        - Demographic categories
- Formats of Reported Data
- Special Promotions Impacting Measurements (where applicable)
- Nature of Auditing Applied and Directions to Access to Audit Report
- Sampling/Projections Used
    - Sampling Methods
    - Explanation of Projection Methods

Data Collection Methods Employed

- Method of Data Collection
    - Cache Busting Techniques Employed
    - Logging Method (including method(s) for determining that ad is loaded and at minimum begins to render prior to counting, or method/basis for click measurement)
    - Logging Frequency (frequency and batching parameters)
    - Logging Capture Point (place in measurement transaction)
    - SDK and API details and functionality (where applicable)
- Types of Data Collected
    - Contents of Log Files
- Procedures to Detect and Report Pre-fetch/Pre-render as well as Auto-Play/Auto-Refresh (where applicable)
- Contacts with Users (if applicable)

- Research on Accuracy of Basic Data
    - Latency Estimates
- Rate of Response (if applicable)

Editing or Data Adjustment Procedures

- Checking Records for Completeness
- Consistency Checks
- Accuracy Checks
- Rules for Handling Inconsistencies
- Circumstances for Discarding Data
- Filtration Procedures (considering IVT Addendum controls over protecting IVT techniques)
- Handling of Partial Data Records
    - Ascription Procedures (if used or applicable)

Computation of Reported Results

- Description of How Estimates are Calculated
    - Illustrations are desirable
- Weighting Techniques (if applicable)
- Verification or Quality Control Checks in Data Processing Operations
- Pre-Release Quality Controls
- Reprocessing or Error Correction Rules

Reporting Standards (if applicable)

- Requirements for Inclusion in Reports, Based on Minimum Activity Levels

Reliability of Results

- Sampling Error (if applicable)

Data retention rules (to make customers aware of the data retained in case of reprocessing)

- Maintaining sufficient data or processes that allow for audit trail

Limitations on Data Use

- Non-sampling Error
- Errors or Unusual Conditions Noted in Reporting Period
- Limitations of Measurements

7.0 Auditing Guidelines

7.1 General

Third-party independent auditing is encouraged for all ad-serving applications used in the buying and selling process. This auditing is recommended to include both counting methods and processing/controls as follows:

1. Counting Methods: Independent verification of activity for a defined period. Counting method procedures generally include a basic process review and risk analysis to understand the measurement methods, analytical review, transaction authentication, validation of filtration procedures and measurement recalculations. Activity audits can

be executed at the campaign level, verifying the activity associated with a specific ad creative being delivered for performance measurement purposes.

2. Processes/Controls: Examination of the internal controls surrounding the ad delivery, recording and measurement process. Process auditing includes examination of the adequacy of site or ad-server applied filtration techniques.

Although audit reports can be issued as infrequently as once per year, some audit testing should extend to more than one period during the year to assure internal controls are maintained.
Audit reports should clearly state the periods covered by the underlying audit testing and the period covered by the resulting certification.

7.2 U.S. Certification Recommendation

All ad-serving applications used in the buying and selling process are recommended to be certified as compliant with these guidelines at minimum annually. This recommendation is strongly supported by the 4A's and other members of the buying community, for consideration of measurements as "currency."

Special Auditing Guidance for Outsourced Ad-Serving Software

Ad serving organizations that market ad serving/delivery software to publishers for use on the publisher's IT infrastructure (i.e., "outsourced") should consider the following additional guidance:

1. The standardized ad-serving software should be certified on a one-time basis at the ad serving organization, and this certification is applied to each customer. This centralized certification is required at minimum annually.

2. Each customer's infrastructure (and any modifications that customer has made to the ad serving software, if any) should be individually audited to assure continued functioning of the software and the presence of appropriate internal controls. Processes performed in the centralized certification applicable to the outsourced software are generally not re-performed. The assessment of customer internal controls (and modifications made to outsourced software, if any) is also recommended to be at minimum an annual procedure.

These certification procedures are only necessary for outsource clients who wish to present their measurements for use by buyers.

Special Auditing Guidance for Advertising Agencies or Other Buying Organizations

If buying organizations modify or otherwise manipulate measurements from certified publishers or ad-servers after receipt, auditing of these activities should be considered.

There are, in addition to MRC, a number of other certifiers and types and levels of certification are available to ad serving organizations.

International Certification Recommendation

The IAB Tech Lab, and MRC encourage non-U.S. measurers of activity to adopt the practices spelled out in these guidelines. While certification regimes may vary on a country-by-country basis, we encourage measurers to be audited for compliance annually by independent, third-party auditing organizations.

8.0 Who We Are

Interactive Advertising Bureau (IAB)

The Interactive Advertising Bureau (IAB) empowers the media and marketing industries to thrive in the digital economy. Its membership is comprised of more than 650 leading media and technology companies that are responsible for selling, delivering, and optimizing digital advertising or marketing campaigns. The trade group fields critical research on interactive advertising, while also educating brands, agencies, and the wider business community on the importance of digital marketing. In affiliation with the IAB Tech Lab, it develops technical standards and best practices. IAB and the IAB Education Foundation are committed to professional development and elevating the knowledge, skills, expertise, and diversity of the workforce across the industry. Through the work of its public policy office in Washington, D.C., IAB advocates for its members and promotes the value of the interactive advertising industry to legislators and policymakers. Founded in 1996, the IAB is headquartered in New York City and has a San Francisco office.

Interactive Advertising Bureau Technology Laboratory (IAB Tech Lab)

The IAB Technology Laboratory is an independent, international, nonprofit research and development consortium charged with producing and helping companies implement global industry technical standards. Comprised of digital publishers and ad technology firms, as well as marketers, agencies, and other companies with interests in the interactive marketing arena, the IAB Tech Lab's goal is to reduce friction associated with the digital advertising and marketing supply chain, while contributing to the safe and secure growth of the industry. The organization's governing member companies include AppNexus, Extreme Reach, Google, GroupM, Hearst Magazines Digital Media, Integral Ad Science, LinkedIn, Moat, Pandora, PubMatic, Sonobi, Tremor Video, and Yahoo! JAPAN. Established in 2014, the IAB Tech Lab is headquartered in New York City with an office in San Francisco.

About the Mobile Marketing Association

The MMA is the world's leading global non-profit trade mobile marketing association comprised of more than 800 member companies, from nearly fifty countries around the world. Our members hail from every faction of the mobile marketing ecosystem, including brand marketers, agencies, mobile technology platforms, media companies, operators and others. The MMA's mission is to accelerate the transformation and innovation of marketing through mobile, driving business growth with closer and stronger consumer engagement. Anchoring the MMA's mission are four core pillars; to cultivate inspiration by driving innovation for the Chief Marketing Officer; to build the mobile marketing capabilities for marketing organizations through fostering know-how and confidence; to champion the effectiveness and impact of mobile through research providing tangible ROI measurement; and to advocate for mobile marketers. Additionally, MMA industry-wide committees work collaboratively to develop and advocate global best practices and lead standards development.

About the Media Rating Council (MRC)

The Media Rating Council is a non-profit industry association established in 1963 comprised of leading television, radio, print and digital media companies, as well as advertisers, advertising agencies and trade associations, whose goal is to ensure measurement services that are valid, reliable and effective. Measurement services desiring MRC accreditation are required to disclose to

their customers all methodological aspects of their service; comply with the MRC Minimum Standards for Media Rating Research as well as other applicable industry measurement guidelines; and submit to MRC-designed audits to authenticate and illuminate their procedures. In addition, the MRC membership actively pursues research issues they consider priorities in an effort to improve the quality of research in the marketplace. Currently approximately 110 research products are audited by the MRC. Additional information about MRC can be found at www.mediaratingcouncil.org.

9.0 References

The following links provide additional sources of information and reference:

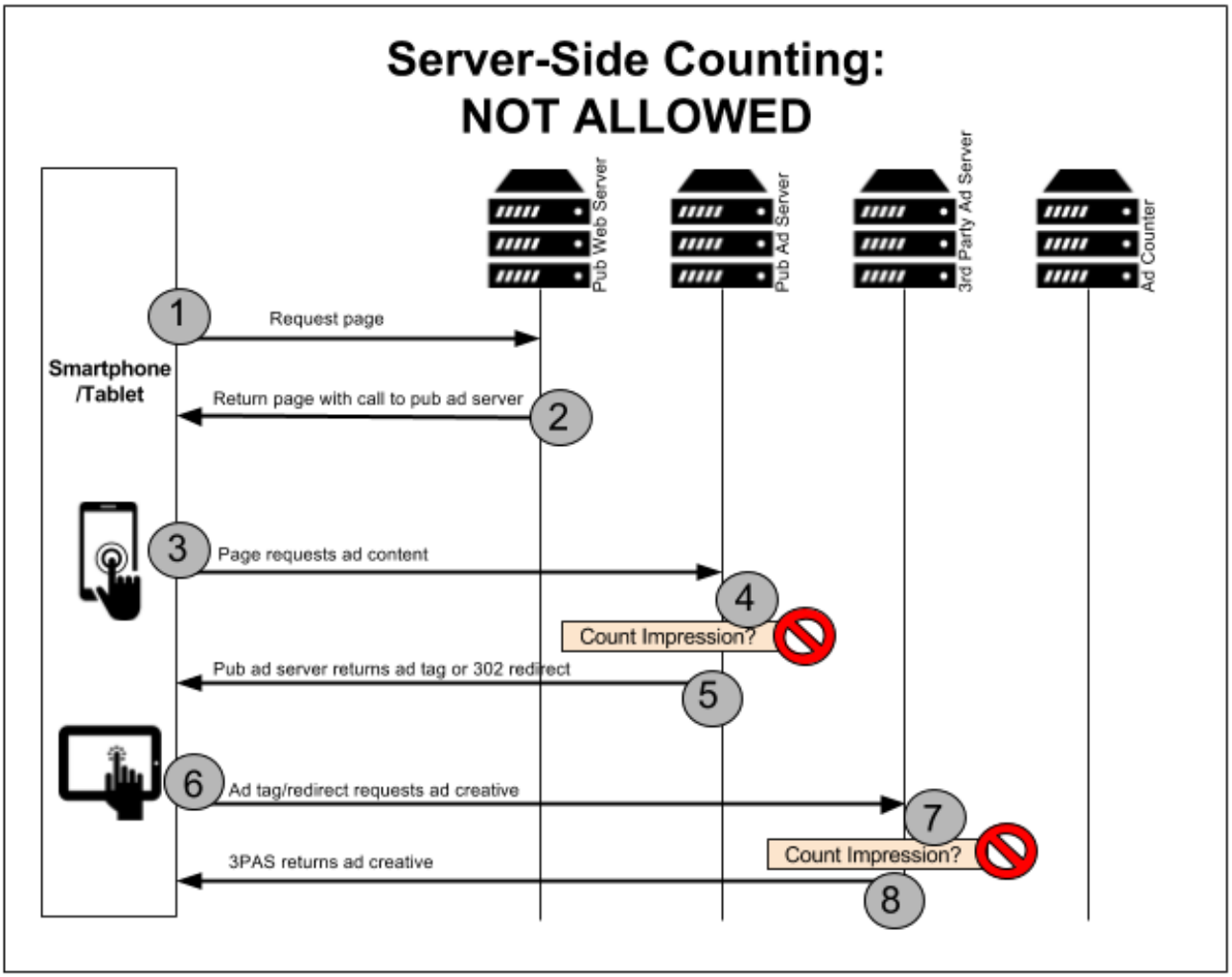
- IAB Mobile Marketing Center of Excellence (http://www.iab.com/mobile)
- Mobile Marketing Association Website (http://www.mmaglobal.com)

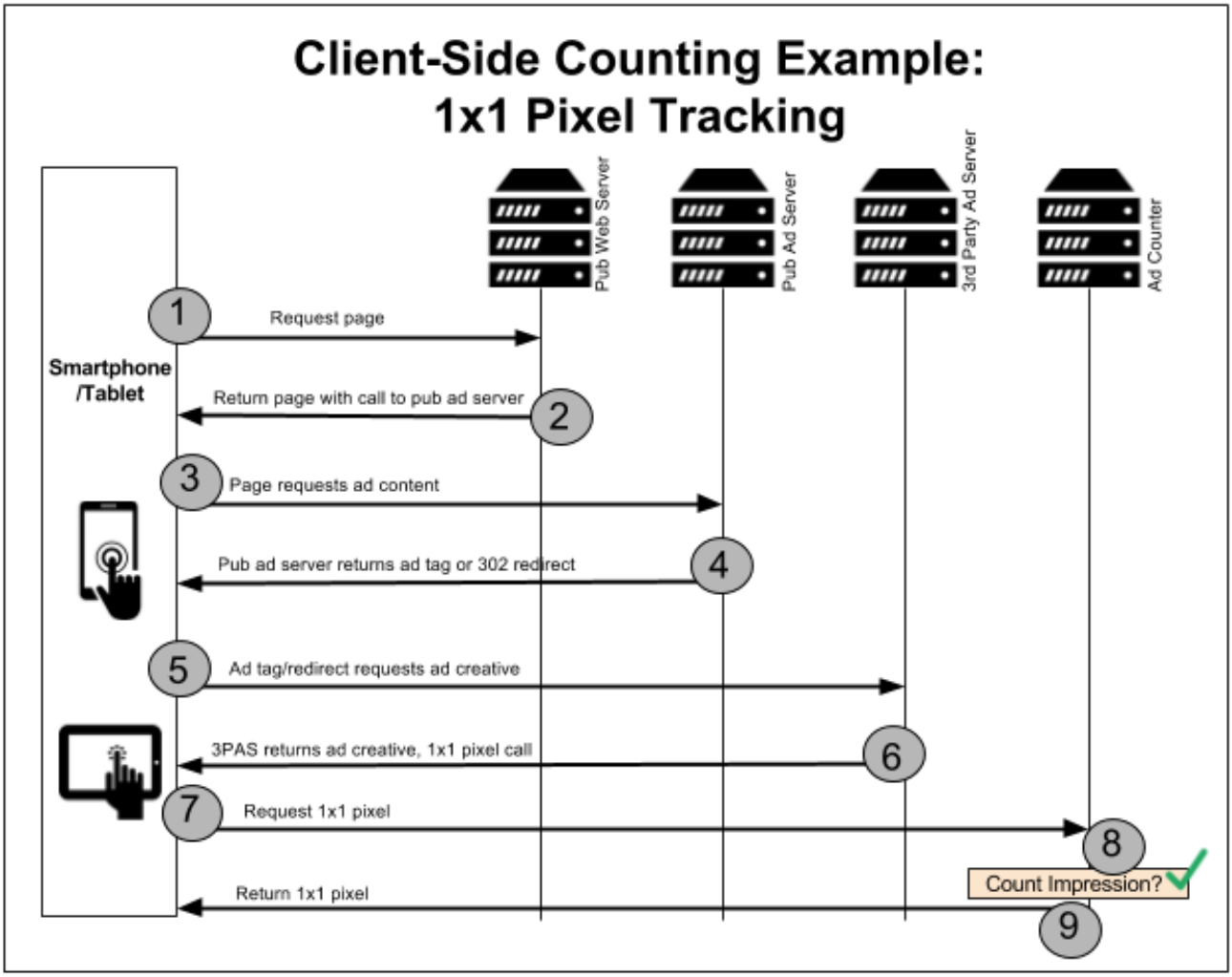
10.0 Glossary of Terms

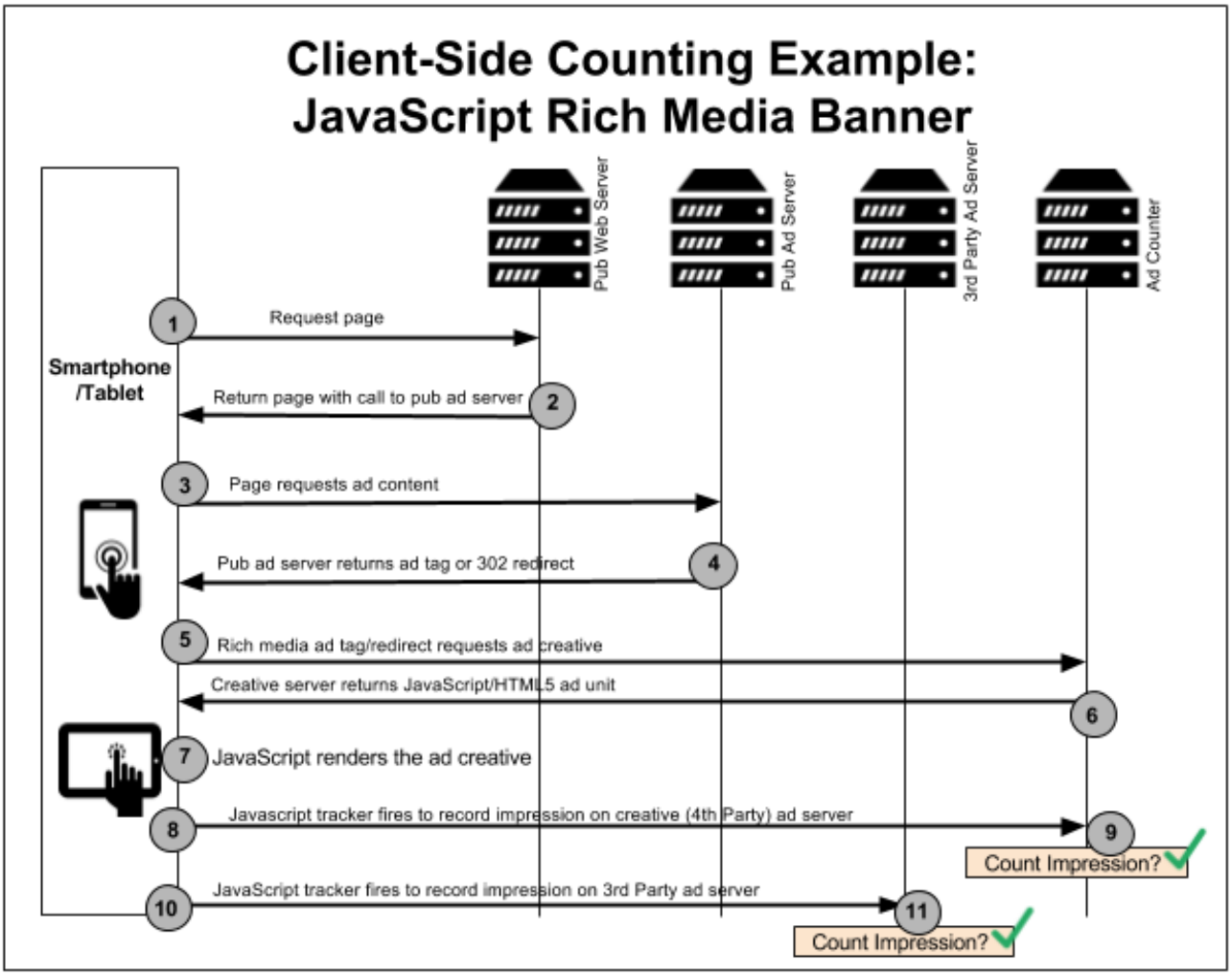
The MMA maintains a compendium of education documents and research. The glossary is available at: http://www.mmaglobal.com/education

APPENDIX A

Examples of Server-Side and Client-Initiated Counting




Client-Side Counting Example:
1x1 Pixel Tracking
Pub Web Server
Pub Ad Server
3rd Party Ad Server
Ad Counter
Smartphone
/Tablet
1
Request page
Return page with call to pub ad server
2
3
Page requests ad content
Pub ad server returns ad tag or 302 redirect
4
5
Ad tag/redirect requests ad creative
3PAS returns ad creative, 1x1 pixel call
6
7
Request 1x1 pixel
8
Count Impression?
Return 1x1 pixel
9


Client-Side Counting Example:
JavaScript Rich Media Banner
Pub Web Server
Pub Ad Server
3rd Party Ad Server
Ad Counter
Smartphone /Tablet
1
Request page
2
Return page with call to pub ad server
3
Page requests ad content
4
Pub ad server returns ad tag or 302 redirect
5
Rich media ad tag/redirect requests ad creative
6
Creative server returns JavaScript/HTML5 ad unit
7
JavaScript renders the ad creative
8
Javascript tracker fires to record impression on creative (4th Party) ad server
9
Count Impression?
10
JavaScript tracker fires to record impression on 3rd Party ad server
11
Count Impression?

APPENDIX B

MRC Digital Advertising Measurement Technical and Transparency Best Practices

Given some of the difficult measurement changes as well as the overall complexity of the advertising environment and the myriad of practices employed by participants in the digital advertising ecosystem, certain best practices should be followed to support valid, reliable and effective measurement.

Principles

- Participation is Voluntary
    - Applicable to Media Seller Organizations
    - Applicable to Measurement Vendors
    - Applicable to Media Buy-Side Organizations, See Specific Section
- Foster Accuracy and Transparency in Measurement
    - Exercise Professional Care in Discharging Measurement Related Activities
    - Continuous Improvement Mind-Set
- Seek to Accredit Measurement Functions that Impact Monetization, Use Accredited Products where Available
    - Comply with Applicable Industry Measurement Guidelines
    - If Accredited, also Comply with MRC Voluntary Code of Conduct (VCOC)
- Support IVT/Fraud Detection and Filtration Processes
    - MRC IVT Guidelines
    - TAG Activities
        - Fostering Centralized Tools and Communication about Fraud, IVT, Piracy, Misappropriated Content
        - Apply TAG Anti-Malware Principles

Measurement Interactions and Communication

- Transparency of Audience Extension Traffic Sourcing
    - Pass Information, Disclosure
- Transparency of Incentivized Browsing
    - Pass Information, Disclosure
- Collecting Measurement-Relevant Information
    - Pass Information, Disclosure
        - Auto-Play Video
        - Auto-Refresh
        - Origination Information in Proxy situations
        - Forced Duration Situations
        - Detection and Response Techniques Employed for Ad-Blocking
- Facilitate and Use Back-Up Creative, when Original Creative Cannot be Served
    - Segregate and Disclose Frequency
- Responsible Use of Browser/Application Tools
    - Page Visibility API
    - Flash Throttle (specific data elements)
    - Use of MRAID, VPAID and VAST and version
    - Protecting Security of Measurement Communication -- Encryption, etc.
    - Pre-fetch and Pre-render Considerations
    - Cache Busting Techniques (allowing random and timestamp append)

- Facilitate Unique Session and Click Identifiers
- Minimize Piggy-Back Tagging
    - Reduce/Minimize Tagging-Related Latency
- Consideration of User Experience
    - Minimizing Intrusiveness
        - LEAN
        - Guard Rails Around Redirects, Page Takeover, Clutter
- Adopt Industry Infrastructure Standards, as Appropriate -- MRAID, VAST, VPAID, SafeFrame
- Adherence with Discrepancy Resolution and Communication Processes

Marketing with Best Digital Measurement Practices (applicable to media buy-side organizations)

- Encouraging Media Seller Partners and Measurement Vendors to Adhere to Best Practices
- Establishing Campaign Requirements that are Aligned with Best Practices

Compliance Representations

- Represent Compliance with this VCOC Accurately
- Escalation Process for Misrepresentation

Other Matters

- Responsibility for Updating of VCOC