

Description of Methodology

Webcast Metrics

TRITON DIGITAL



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D I G I T A L

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1. Overview

This Description of Methodology (DOM) is a summary of the Internet audio streaming measurement processes employed, including a general description of our measurement methodology, filtration processes and reporting procedures.

This document may be found here:

<http://www.tritondigital.com/media/default/rankers/triton-digital-methodology.pdf>

2. Introduction

Triton Digital performs “census based” Internet audio streaming traffic and audience measurement. No samples, surveys or panels are utilized in the collection, transformation or display processes and procedures described herein. In each case, Triton Digital obtains data on each stream including the station, individual stream start time, individual stream duration, and listener identifier. This methodology is based on all session activity recorded (subject to filtration procedures described in section 3).

Webcast Metrics[®] (WCM) is an online reporting interface in which the station publishers can obtain detailed reporting related to their streams, but cannot obtain reporting related to streams owned or operated by other companies. Webcast Metrics[®] can be used by station publishers to monitor audience data for any custom period they wish to review or compare.

Triton Digital also publishes an Internet Top 20 Ranker report on a monthly basis. The Top 20 Ranker is a listing of the top-performing Internet audio stations and networks measured by Webcast Metrics[®] (see section 5 for more information on the creation guidelines for this report). It provides high-level metrics such as "Session Starts," "Average Active Sessions" and "Average Time Spent Listening" to the general public. A detailed description of each metric is provided in section 4.

3. Data Collection

Triton Digital utilizes two methods for collecting the above data:

1. Through raw log files of streaming activity collected daily from the Content Delivery Network (CDNs) hosting the radio station players (referred to as the “CDN log file method”);

Or

2. Through client-side measurement, by collecting the data directly from the web based player or mobile device (referred to as the “listener tracking method, or LT”).

3.1. CDN Log File Method

The CDN log file method involves obtaining log file information from the station’s content delivery network. When a station publisher broadcasts an Internet audio stream, it is delivered to a content delivery network, such as Akamai Technologies, Edgecast Networks, Limelight Networks or StreamGuys. The CDN then distributes the streams via a network of geographically disbursed delivery points (servers), and logs the transactional activity. An individual log file is made available daily by the CDN for each station. It contains the details of all listener sessions for a given day. With respect to the scope of this document, the key data points within the log files are session identifying information, the stream start time, duration and the IP Address.

Triton Digital clients (station publishers) arrange or approve release of the CDN streaming log files directly to Triton Digital in a predetermined format. That is, the log files are generated and controlled by the CDN, and not the station publishers. Triton Digital is provided FTP login access to retrieve the log files directly from the CDN servers. This process is intended to prevent the station from having an opportunity to manipulate the log files, and thereby the metrics reported by Triton Digital.

3.2. Listener Tracking Method

Because Listener Tracking performs “client-side” audience measurement via the listeners’ browsers, it requires the integration of a tracking code in every ‘embedded media player’. This code communicates with the measurement servers during the streaming session. This method has also been referred to as the client-side tracking method, cloud based measurement method, the HTTP listener tracking methodology and the ping method.

Listener tracking can be implemented as a Flash or as a JavaScript solution. If the web page and player do not have Flash components, the JavaScript implementation must be used, but if either have Flash components, the Flash implementation is the preferred method.

In both types of implementation, the listener tracking functionality monitors and reports the initiation, continuation, pausing and resuming, and termination of the stream. Triton Digital utilizes a combination of third party cookies (GVID) and publisher supplied unique user ID (VID) to report a CUME figure based on unique cookies or VID. If not provided, Triton then falls back on IP plus User Agent. Upon initiation of the stream, an initial start event is sent to the measurement servers identifying the stream (e.g., Station ID) and any additional optional information the station includes in the event string. The tracking system then continues to send events every sixty seconds as long as the stream is active (referred to as a ping event). If the user pauses the stream, the ongoing event is stopped until the listener resumes the stream. In cases where the pause event was less than three minutes, the ongoing event is resumed and

counted, otherwise, a new session is started (a new start event is sent). Finally, if the user ends the stream, the ongoing event is stopped, and if the user subsequently starts the stream again, a new session is started, regardless of the time between the end event and the new start event.

Effectively, as described above, there are two types of events; a new session start event (also referred to as a new listener event) and an ongoing event (also referred to as a ping event). In both the JavaScript and Flash implementation, each of these events includes a random number appended to the end of the URL string (a new random number is generated for each ping event) to reduce the chance of the event being cached by local, proxy or network cache, and therefore not reaching the measurement servers.

Triton Digital has also developed a direct measurement methodology that is designed for publishers utilizing embedded devices or custom applications that do not operate within a web browser environment. In these situations, the above described code integrations cannot be used, but using this direct measurement method (the “advanced method”), the client can configure their device or application to make these new listener and ping events. In response to the initial new listener event, the listener tracking system will return two parameters for the ping event: the interval at which the player should send the ping event, and a GUID, which is an encoded string comprised of the station ID, date and time stamp and a random number. Thus, this GUID is expected to be unique for each stream; however, the GUID will be the same for each ping event sent during a session.

4. General Invalid Traffic Filtration Processes

Triton Digital employs several techniques 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. Because user identification and intent cannot always be known or discerned by the publisher, advertiser or their respective agents, it is unlikely that all invalid activity can be identified and excluded from report results. Our techniques are described below:

4.1. One Minute Rule

Due to the nature of streaming activity, and the general behavior of robotic/spider related traffic, we have implemented a process whereby streaming sessions with a duration of less than one minute are considered invalid and are removed from all measurement collected data. This rule reduces most of the noise from extremely short sessions, robotic activities and initial connectivity issues without dropping valuable audience. Robots/spiders typically connect to a site and “walk” the valid links of the site. Triton Digital has not detected ANY robotic/spider activity that has the capability to consume a “stream” for longer than one minute.

This rule applies to both data collection methods. When log files are provided by the CDN, sessions with a duration of less than one minute are not inserted in the database table used by Webcast Metrics®.

When data collection is performed through listener tracking method, a session is considered active upon the first ping event, which occurs after 60 seconds.

4.2. IAB/ABC International Spiders and Bots List

In addition to the One Minute Rule, Triton Digital has implemented filtering based on the IAB provided Spiders and Bots List¹ in order to exclude site-traffic associated with robotic activity from the collected data. For example, this filtering process allows us to exclude http requests from search engines spiders (Google, Bing, Yahoo, etc.). To do so, an exclusion list (Robot.txt) was configured on all collection servers and is configured to disallow all.

In certain logfile implementations Triton Digital does not have the ability to filter for user agents. As such, these sessions are not filtered out of the reported metrics data.

4.3. Internally Generated Traffic

Based on IP address, Triton Digital removes all internally generated stream session data from measurement collected data. Triton Digital's staff uses a virtual private network (VPN) which is a computer network that uses the Internet to provide offices users with secure access for internal traffic. This VPN IP address is blocked from collection/reporting functions. This rule applies to both data collection methods and is performed at the database level. Triton Digital also removes internal traffic generated by participating stations/publishers.

4.4. Activity-based Filtration

Triton Digital also employs activity filters to identify anomalies. All suspicious streaming activity is documented in a monthly report and the publisher is immediately notified. Triton Digital works with publishers and CDNs to investigate and solve the issue.

4.5. Gross Invalid Traffic Figures

An analysis month over month of Triton Digital's gross verses filtered traffic shows that network TLH is reduced on average by .16% and AS by .08%.

¹ For more information on this list, please refer to: <http://www.iab.net/sites/spiders/login.php>

5. Data transformation

Whether using the listener tracking method or the CDN log file method, Triton Digital obtains log files from the measurement servers and CDNs for processing. The log processor transforms the various log files and formats into a single Triton Digital processing format prior to further processing. To reduce the potential for excluding data due to delays at the CDN in posting the log files for Triton Digital's retrieval, and to provide reporting on longer sessions, Triton Digital processes log files four days in arrears. Additionally, Triton Digital truncates any sessions lasting longer than twenty-four hours.

During the initial log processing and transformation, an audit table is populated with information on logs retrieved, logs processed and errors. Errors include: (a) situations where a compressed log file cannot be uncompressed, (b) invalid data, (c) any transform failures. In addition to being logged in the audit table as an error, these log files are removed from processing and held for manual intervention. Streaming records with zero duration are also removed during this process.

Additionally, streaming sessions less than one minute in length are removed from processing. Based on an analysis, Triton Digital has determined that approximately 20% of sessions were less than sixty seconds in length, and were therefore excluded from processing. Triton Digital employs a de-duping process that ensures that duplicate records are rejected and not utilized for reporting. When log files are provided by the CDN, the de-duping process occurs when the file is brought down from the CDN's server. If the file already exists in Triton Digital's local folder, it will be ignored. When data collection is performed through listener tracking method, any redundant sessions are stripped out before being inserted in the final database table used by Webcast Metrics[®].

Once the data is processed and aggregated, Webcast Metrics[®] is updated and stations may begin to review reports related to their streams. Webcast Metrics[®] is a web-based user interface, which includes reporting on the following metrics:

Total Listening Hours (TLH)

Total number of hours that the station/publisher has streamed during sessions with a duration of at least one minute in total and any duration within the reported time period.

Average Time Spent Listening (ATSL)

The average number of hours for each session with a duration of at least one minute in total and any duration within the reported time period. Calculated as total time spent listening divided by active sessions.

Sessions Started (SS)

Number of different requests for streams (i.e. stream requests) with a duration of at least one minute in total and any duration within the reported time period.

Active Sessions (AS)

Number of sessions that were active, with a duration of at least one minute in total and any duration within the reported time period.

Average Active Sessions (AAS)

TLH divided by hours in the reported time period.

Average Active Sessions Five (AAS5)

TLH divided by the number of hours in the reported time period for sessions with a duration of at least five minutes in total and any duration within the reported time period.

6. Triton Digital Monthly Ranker Creation Guidelines

Triton Digital also produces a Monthly Ranker report for public distribution that reports on the Top 20 stations based on AAS during the Monday to Friday, 6:00am to 8:00pm daypart.

Included in the report are AAS, SS and ATSL for each of the reported stations, for the Monday to Friday, 6:00am to 8:00pm daypart. The report is produced for both total streams and domestic stream using an IP Address geo-location vendor.

6.1. General Assumptions

6.1.1. Granularity

- All time based calculations shall be based in whole seconds, and expressed in hours/minutes or hours/portion of hour.

6.1.2. Time Zones

- Sessions are selected based on Listener Location time zone. This is referred to as “Time zone Normalized”;
- Sessions whose time zone cannot be identified shall be normalized to the Central Time zone.

6.1.3. Length of Valid Sessions

- Sessions with a duration of less than or equal to sixty seconds shall be **discarded**;

- Sessions with a duration greater than seventy-two hours shall be **truncated at the twenty-four hour mark**.

6.2. Definitions

- **TLH** = Total number of hours that the station/publisher has streamed during sessions with a duration of at least one minute in total and any duration within the reported time period.
- **AS** = Number of sessions that were active, with a duration of at least one minute in total and any duration within the reported time period.
- **ATSL** = The average number of hours for each session with a duration of at least one minute in total and any duration within the reported time period. Calculated as total time spent listening divided by active sessions.
- **SS** = Number of different requests for streams (i.e., stream requests) with a duration of at least one minute in total and any duration within the reported time period.
- **AAS5** = TLH divided by the number of hours in the reported time period for sessions with a duration of at least five minutes in total and any duration within the reported time period.

7. Measurement limitations

7.1. Domain Blocking Tools

- With certain browsers, software or tools, users have the ability to block content (including new listening and ping events) based on the domain from which the content is being requested. Blocking techniques or software that prevent communication with the Triton Digital measurement servers would prevent both the communication of the new session start event and ongoing ping events, although the user would still be listening to the station/publisher stream as that originates from a different domain, resulting in an undercount of the streaming event, in this situation, for stations/publishers utilizing the listener tracking method.
- Stations that operate through a proxy or that utilize the log file method will not be affected as the communication of streaming events takes place between the CDN and the measurement server, not the browser/player and the measurement server.
- These situations are not unique to Triton Digital. Additionally, these situations are difficult to quantify without special studies and analyses being performed.

7.2. Exclusion of Publisher/Station Data

- Participating publisher internal traffic is identified via publisher supplied IP address and excluded from reported data.

7.3. Other Limitations

- In addition to the measurement limitations noted above, certain log entries may be corrupted or otherwise unusable in the accumulation of streaming data.
- A listener may mute their stream as a function of the player application or a function of the operating system. Triton Digital is not able to capture this event in all instances.
- LT methods have the ability to detect and account for pause - however, this functionality implementation is not required. As such, there will be instances where pause duration is included in total listening time.
- In some cases, audio players require JavaScript to be enabled. If JavaScript is disabled, the player itself will not execute, resulting in no call made to Triton Digital's servers. Triton Digital is not able to capture events in this instance therefore the session would not be counted.
- Similar to JavaScript, some audio players also require Flash to be enabled. If Flash is disabled, the player itself will not execute, resulting in no call made to Triton Digital's servers. Triton Digital is not able to capture events in this instance therefore the session would not be counted.
- Data are considered preliminary for a period of seven days. We do not include all stations or networks in our ranking, but only those who subscribe to our Webcast Metrics[®] service.
- In the case of LT based data, data are collected directly from the publisher's application. Triton Digital audits publisher applications annually. Changes to applications between audit periods may affect the quality of the data collected.
- Triton Digital implements standard cache busting techniques by affixing a randomly generated string to all transactions. While this eliminates most caching, it is not 100% reliable.
- For publishers that operate on the CDN log file methodology and some LT methodologies, Triton Digital does not currently have the ability to determine if a player is buffering pre- or mid-stream as the communication of streaming events takes place between the CDN and the measurement server and not the browser/player and the measurement server. Therefore, any time incurred as a result of buffering would ultimately be included within WCM reporting. Additionally, measurement of these sessions could also be limited to a buffering threshold defined by the publisher.
- Webcast Metrics[®] does not discriminate between ad free content vs subscription content that publishers make available. It is simply a measure of all listening within the specified day parts and geography for the specified calendar month.
- Anyone that uses the information contained in our ranker agrees that Triton Digital will not be liable for any direct or indirect loss arising from the use of such information.

- Certain combinations of OTT devices, and/or OTT publisher data may not be available for measurement. Logfile based publisher data typically contains OTT measurement data while LT based publisher data might not contain measurement data.
- Measurement of OTT devices for the Listener Tracking system requires the OEM to instrument the device, while CDN streaming logfiles typically capture listening data without modification.
- The 24-hour duration rule is a “maximum allowable” filter, as certain publishers may implement duration limits that fall under the maximum of 24 hours.
- Anyone who uses the information contained in our ranker agrees that Triton Digital will not be liable for any direct or indirect loss arising from the use of such information.

8. Triton Digital General Data Policies

8.1. Webcast Metrics[®] Data Retention

- WCM data detailed records are maintained on a rolling thirteen month schedule.
- Raw log files are maintained for a rolling thirty-two days.

WCM data is available online for the past three months (including the current month) for a total of four months of active WCM data. The near-line archive database maintains data starting in 2008, and is updated nightly. Data prior to 2008 is stored as offline backups.

8.2. Data Error Disclosure

- Triton Digital will reissue data whenever an error or omission is found that impacts any reported metric, for any station, by more than 5%, or would lead to a change in the ranking of impacted station(s).
- Triton Digital will utilize its Constant Contact database and communicate the above error or omission via email.

8.3. Data Confidentiality

- Triton Digital will not share data across ownership groups without prior written permission. Proof of written permission shall be maintained at the corporate office.

8.4. Notification

- Where applicable, notification of error or omission will be distributed via the Constant Contact database (email). In regards to Ranker data, a notification will also be placed on the WCM dashboard directing users to the detail of the error or omission.
- As it pertains to any future changes in methodology that may affect the overall measurement and reporting of reported metrics (i.e. TLH, Cume, ATSL, SS, AAS and AS), client will be notified via the Constant Contact database (email).

8.5. Hying/Failure

- Where applicable, Triton Digital shall footnote in the published ranker situations where there are known technical difficulties or hyping actions (i.e., power failure lasting multiple days, a natural disaster, stations offering cash incentives for listening for a certain period of time, etc.).

8.6. Partner Qualification Controls

- In order to ensure that Triton Digital is only dealing with legitimate entities as business partners, we require they fill out a credit application, sign a Master Services Agreement and WCM-specific Terms & Conditions document. The credit application allows us to verify their legitimacy as a sound entity.
- During the implementation process, Triton Digital conducts publisher audits on all new WCM clients in order to ensure CDNs are not manipulating data and we are reporting valid metrics.
- Triton Digital has relationships with a number of business partners, namely geolocation vendors and CDNs, that are considered material to our measurement services.